USER GUIDE

MAS.1.82/220.Y

Radwag

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WEIGHING MODULES

MAS Y
MPS Y
MAS 1. Y

USER MANUAL

IMMU-25-01-08-18-EN

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

JULY 2018

"The drawings, photos and graphics used are for illustrative purposes only."

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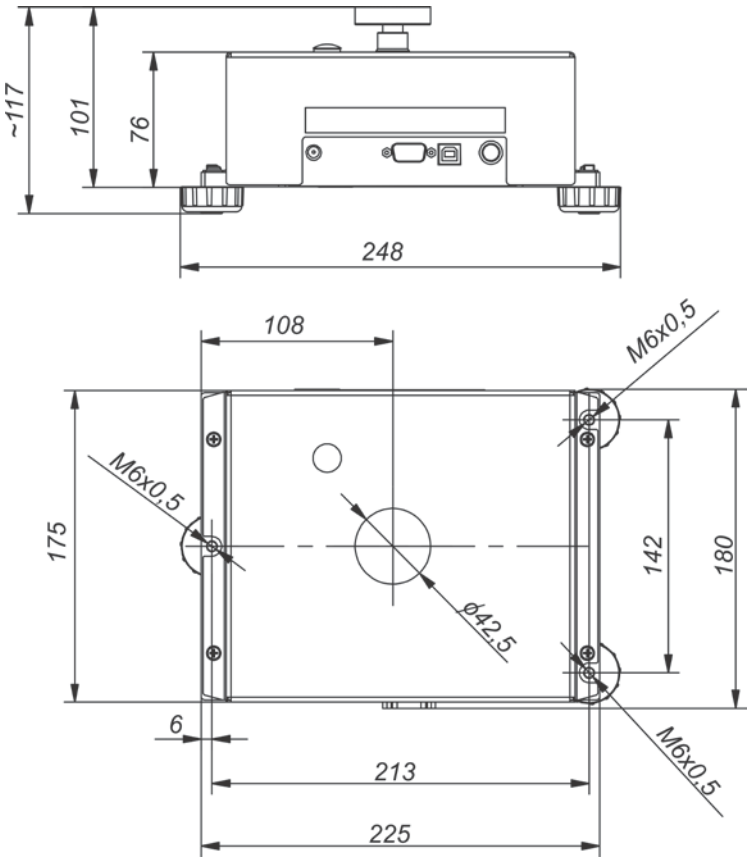
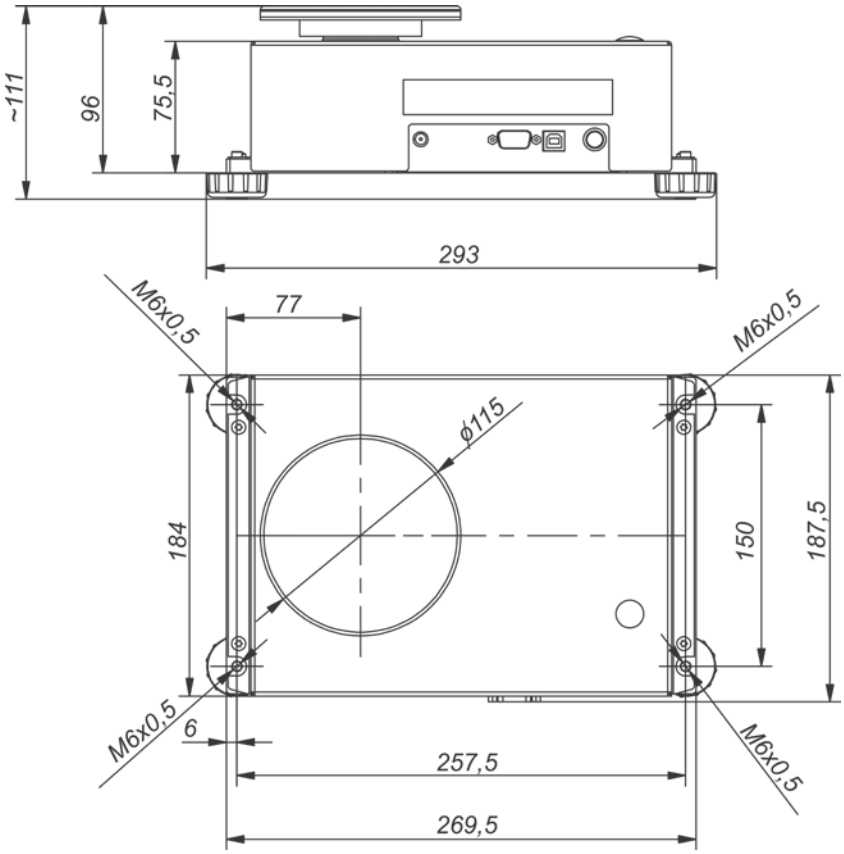
1. GENERAL INFORMATION

1.1. Dimensions

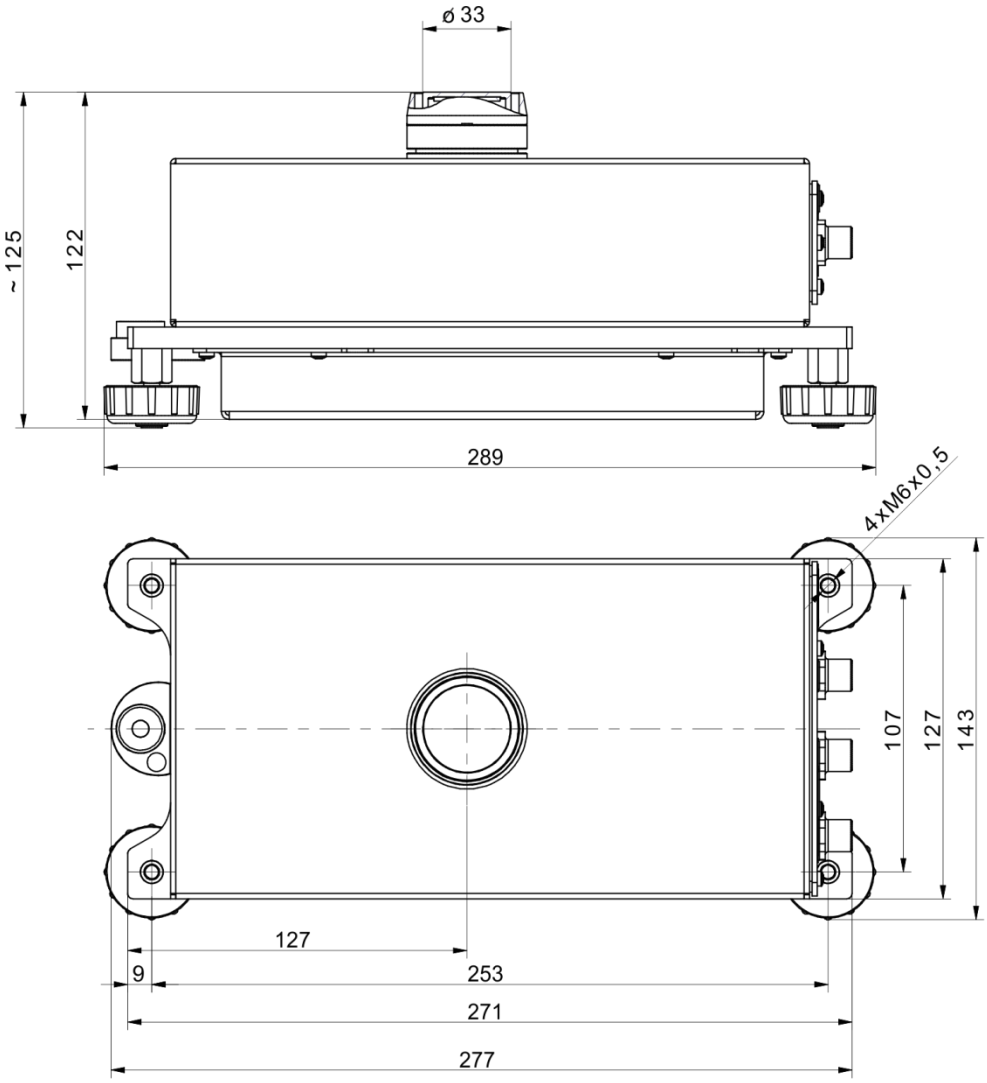
MAS Module



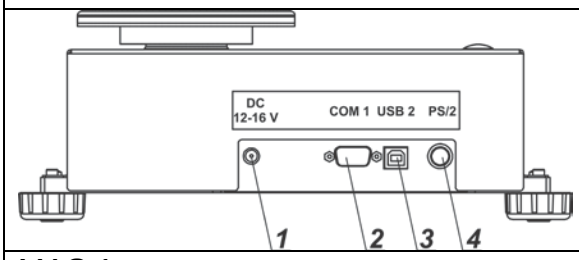
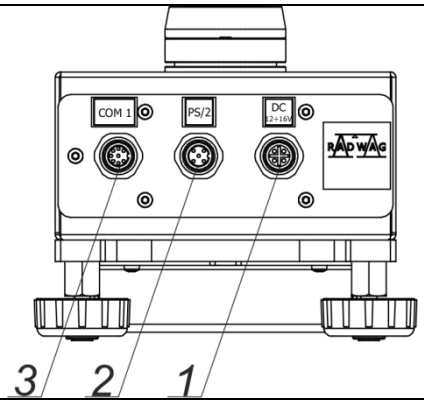
MPS Module



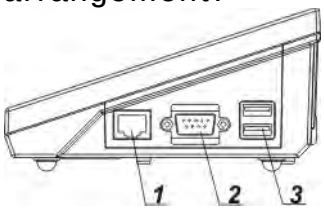
MAS 1 Module

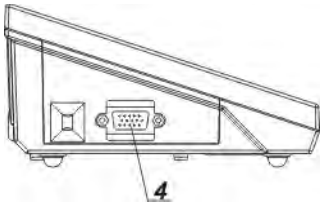


1.2. Connectors Arrangement

MAS and MPS	
	**1** - power supply seat **2** - COM 1 connector (e.g. printer) **3** - USB 2 connector (e.g. computer) **4** - operator panel connector
MAS 1.	
	**1** - power supply seat **2** - operator panel connector **3** - COM 1 connector (e.g. printer, computer)

Connectors arrangement:



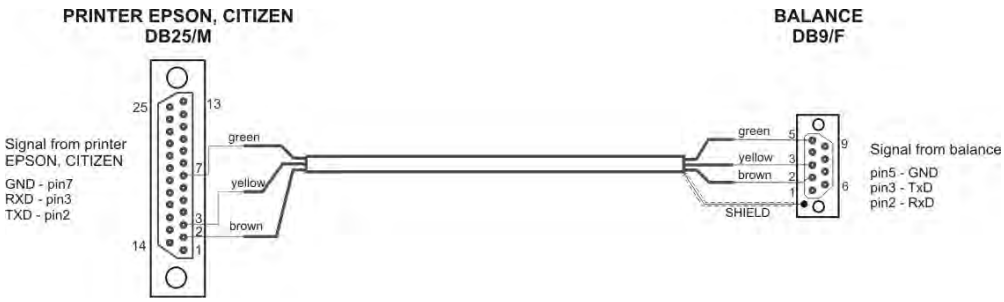


1 – Ethernet RJ45 connector
2 – RS232 (COM1) connector
3 – USB connector

4 – I/O, RS232 (COM2) connector

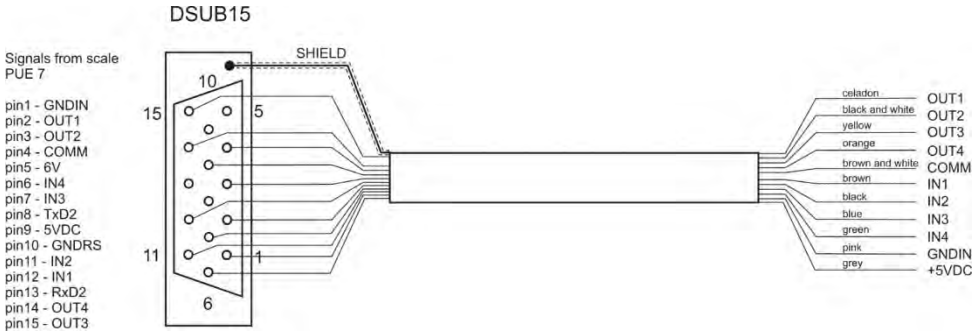
Caution:
"Ethernet – weighing device" cable is a standard network cable terminated with RJ45 connectors on both ends.

balance – computer (RS232) cable



balance – printer cable (EPSON)

I/O cable



1.3. Intended Use

The weighing module is based on electromagnetic digital converter. The modules are intended for installation on technological lines or in laboratory equipment which require mass measurements of the accuracy not lower than 0.1 mg.

Communication with the module is carried out directly via RS 232 interface or optional operator panel.
Measurements can be carried out using weighing pan or under-pan weighing system - when the load is suspended beneath the module *(does not apply to MAS.1 module)*.

The modules feature internal adjustment, triggered by temperature change, and definable time interval as well as the weighing pan overload protection. They are also equipped with the following communication interfaces: 1 x RS 232, USB type B *(does not apply to MAS 1. module)*, PS/2.

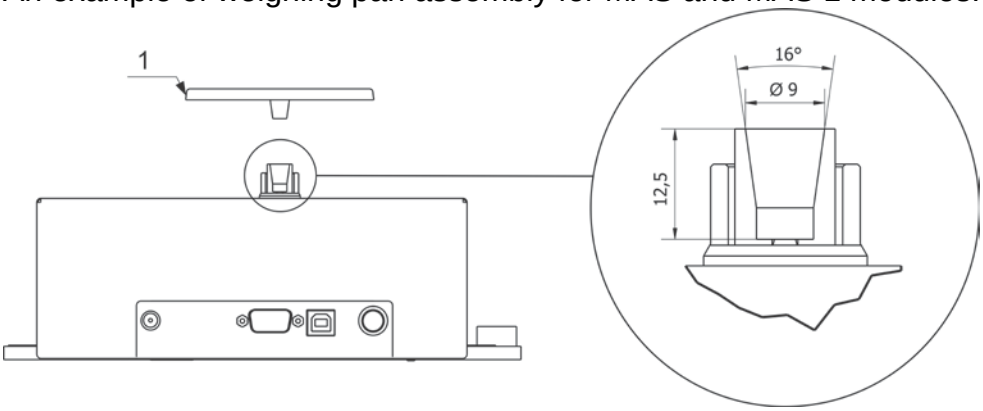
Possible configurations:

	connected with Y series operator panel.

1.4. Good Weighing Practice

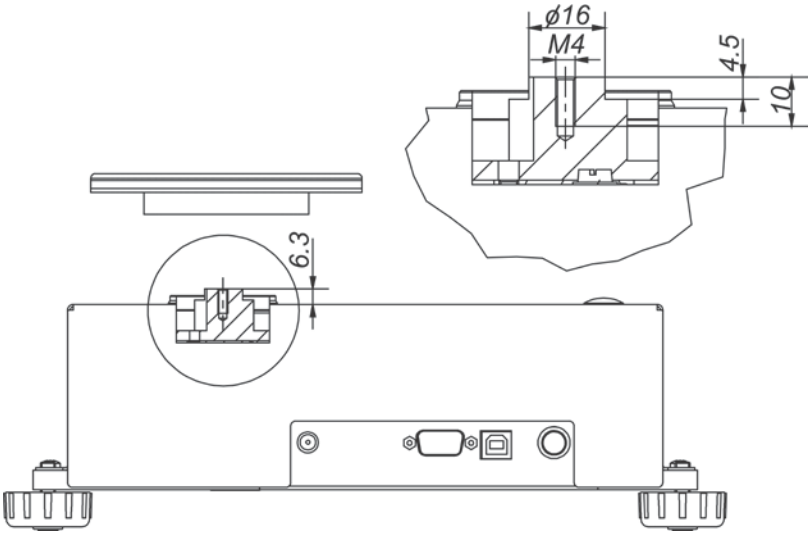
Module housing is made of aluminium and the weighing pan of stainless steel. It is possible to use a non-standard weighing pan and adjust it to the holding fixture (see the fixture dimensions in the figure below).

An example of weighing pan assembly for MAS and MAS 1 modules:



CAUTION: in order to avoid any problems, the used supplementary pan has to weigh about 103g (standard weighing pan, delivered with the weighing module, is 103g).

An example of weighing pan assembly for the MPS module:



Due to the module high measuring accuracy, it is recommended to install it inside customer's instrument (e.g. in a draft shield) in order to reduce the influence of ambient conditions on the measurement result.
The module is not intended for dynamic weighing. Even if small amounts of sample are added to or taken off the weighing pan, the mass readout should only be taken on stabilization of measurement result (upon displaying stability pictogram). Do not place magnetic materials on the weighing pan. This can damage the measuring system.
Be sure to avoid impact shock and overloading the weighing pan. Remember to include the tare (e.g. mass of a container loaded onto the weighing pan). The module is not designed to operate in hazardous areas.

1.5. Precautions

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

1.6. 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 the manufacturer and user representatives.
C. RADWAG does not bear any responsibility for damage or loss resulting from unauthorized or inadequate performing of production or service processes,
D. The warranty does not cover:
   - mechanical damage caused by product exploitation other than intended, damage of thermal and chemical origin, and damage caused by lightning, overvoltage in the power grid or other random event,
   - damage caused by product exploitation other than intended,
   - mechanical damage, if service claims removing or destroying protective stickers which secure the balance's housing against unauthorized access,
   - damage caused by liquids, water and natural wear,
   - damage caused by inappropriate setting or by electrical wiring failures,
   - damage caused by overloading of the mechanical measuring system,
   - inappropriate cleaning habits.
E. Loss of warranty takes place if:
   - a repair is carried out outside RADWAG authorized service point,
   - service claims intrusion into mechanical or electronic construction by unauthorized people,
   - other than original version of the operating system is installed in a balance,
   - the indicator does not bear company protective stickers.
F. For detailed warranty conditions read the warranty certificate.

1.7. Supervision Over Metrological Parameters

Metrological parameters need to be checked in determined time intervals. Inspection frequency depends on ambient conditions in which the weighing instrument is operated, kind of carried out processes and adopted quality management system.

1.8. User Manual Significance

Even if you are experienced and have already worked with this type of weighing instrument, you are still obliged to read this user manual carefully prior switching the device on. This user manual contains crucial information for correct operation of the module.
As long as you follow the guidelines your balance operation is correct and reliable.

1.9. Operator Training

The weighing device must be utilized and supervised only by personnel who have been trained to use such type of a weighing device.

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. Otherwise 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 device components shall be packed into an original packaging, thus being protected against potential damage during transportation.

3. UNPACKING AND INSTALLATION

3.1. Workstation

- Operate the device in a workroom free of vibrations and shakes, where there are no air drafts nor dust.
- Ambient air temperature cannot exceed the range of: +10 °C ÷ +40 °C,
- Make sure that the relative humidity is not higher than 80%,
- Make sure that the temperature changes slowly in the course of operation.
- Place the weighing instrument either on a robust-design table or on a wall bracket, which is both distant from heat sources and insusceptible to vibrations.
- Take special precaution while weighing magnetic objects, as part of the balance is a strong magnet. Should such loads be weighed, use under-pan weighing option in order to remove the weighed load from an area influenced by the magnet. The hook for under-pan weighing is installed in the weighing instrument’s base. Ground the module’s base should static electricity affect the weighing result. The grounding screw is located at the back of the balance base.

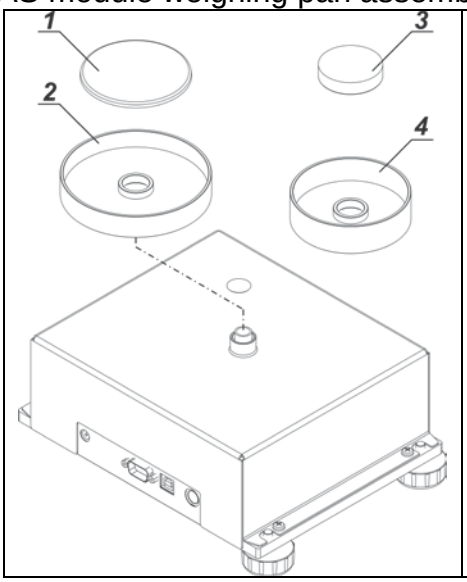
3.2. Unpacking

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

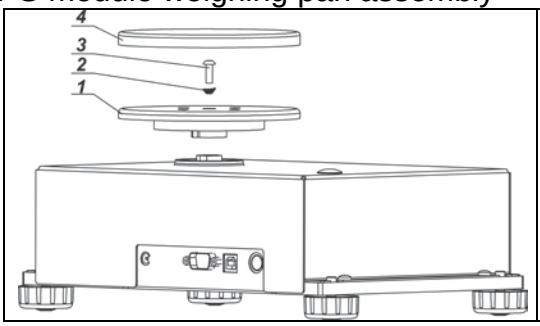
3.3. Standard delivery components list

- Module
- Weighing pan
- Draft shield
- Power supply
- User Manual - CD version

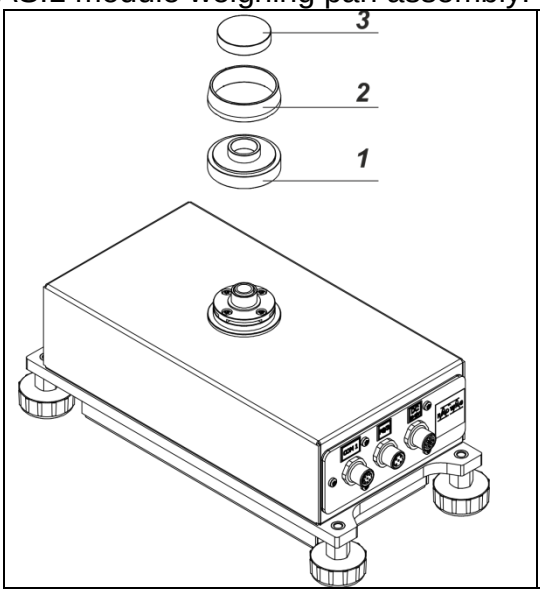
MAS module weighing pan assembly

	Install: - 2 (ø70) or 4 (ø42) draft shield - 1 (ø70) or 3 (ø42) weighing pan

MPS module weighing pan assembly

	Install: - weighing pan base (1) - put the grounding spring (2) onto M4x10 screw (3) and tighten weighing pan base to the module rocker (be careful so as not to damage the mechanism) - cover plate (4)

MAS.1 module weighing pan assembly.

	Install: - weighing pan base (1) - draft shield (2) - weighing pan (3)

3.4. Maintenance Activities

CAUTION:

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

1. Uninstall the weighing pan and other detachable components depending on balance type (refer to section: *UNPACKING AND INSTALLATION)*. Be careful while installing the components so as not to cause any damages to the balance mechanism. Remove the weighing pan of a microbalance using tweezers.
2. Using handheld vacuum cleaner remove dust from the weighing chamber (recommended for microbalances).
3. It is possible to disassemble the anti-draft chamber of XA series balances weighing instruments in order to clean it properly, for disassembly instruction read below.

Cleaning anti-draft chamber panes:

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

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

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

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

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

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

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

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

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

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

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

Cleaning powder-coated components:

For preliminary cleaning process 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.

Cleaning Aluminium Components

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

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

Cleaning stainless steel components:

Avoid using cleansers containing any corrosive chemicals, e.g. bleach (including chlorine). Do not use cleansers containing abrasive substances. Always remove the dirt using microfiber cloth to avoid damage of protective coating.

In case of a daily maintenance:

1. *Remove the dirt using cloth dipped in warm water.*
2. *For best results, add a little bit of dishwashing detergent.*

Cleaning ABS components:

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

The module can be connected to the mains only using a power supply that comes standard with the 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 instrument to the mains – connect the power adapter to the socket, next plug its connector to interface located at the side of the instrument housing.
Upon plugging the instrument to the mains the software runs. During the module start, the test of an internal adjustment mechanism takes place (the internal adjustment weight is put down and lifted up).

3.6. Temperature Stabilization Time

Before start of the measuring processes, it is necessary to wait until the balance reaches thermal stabilisation.
Balances stored in much lower temperatures, than the workroom temperature, before being plugged to the mains (e.g. during winter period) must be subjected to thermal stabilisation. The thermal stabilisation period takes about 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 Peripheral Equipment

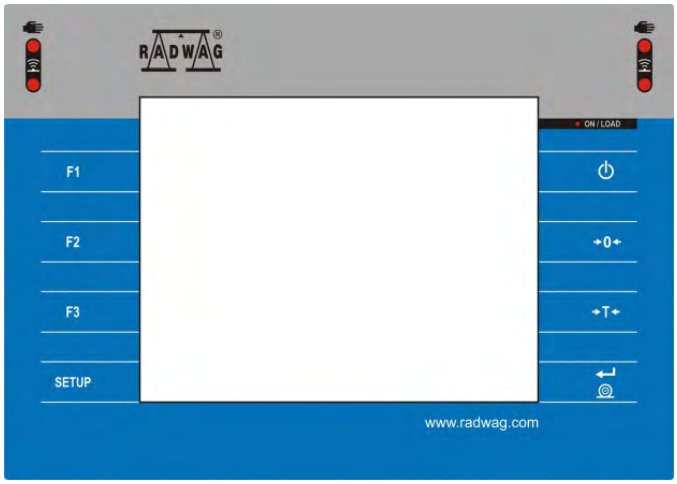
Use only accessories and peripheral equipment recommended by the manufacturer. The balance must be disconnected from the mains before connecting or disconnecting any peripherals (printer, PC computer, computer keyboard of USB type, additional display). Upon connecting the peripherals, plug the balance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

4. START-UP

- Connect the power supply to the mains, ON/LOAD ON / LOAD diode on the operation panel lights up.
- Press ⏻ key located on the top of the operation panel. Within a few seconds the OS Windows and RADWAG software start loading, it is signalled by flickering ON/LOAD red diode.
- Upon completed start-up, 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 logging procedure read later sections of this user manual).

Caution: *Before you start the balance, make sure that there is no load on the weighing pan.*

5. OPERATION PANEL



Key	Overview
⏻	Press to switch the balance ON/OFF.
→0←	Press to zero the balance
→T←	Press to tare the balance
↵	Press to send measurement to a printer or a computer
SETUP	Press to enter the menu.
F1	Press to select working mode; programmable key.
F2	Press to select profile; programmable key.
F3	Press to carry out an internal adjustment; programmable key.

6. PROGRAM

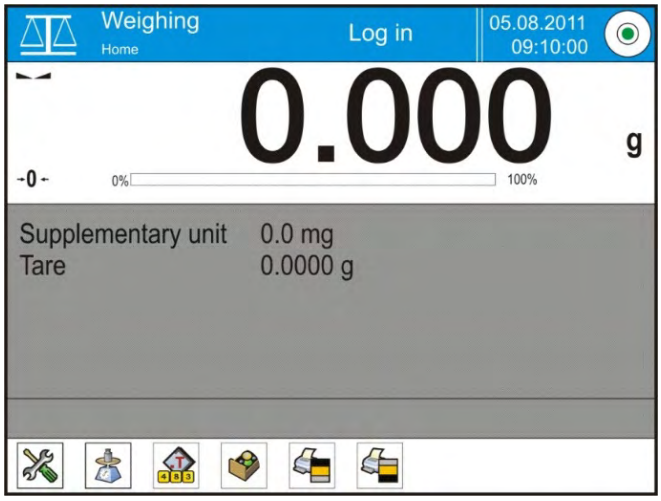
Program menu is divided into function groups. Function group is a group of interrelated parameters. For detailed description of each menu group read later sections of this user manual.

Menu - Function Groups:

To access the menu, press SETUP function key or button located in the bottom part of the display. The menu comprises parameters related to balance settings, functions and profiles.

ADJUSTMENT	OPERATORS	PROFILES
DATABASES	COMMUNICATION	PERIPHERAL DEVICES
INPUTS/OUTPUTS	PERMISSIONS	MISCELLANEOUS
UPDATE	ABOUT (system info)	VIDEOS

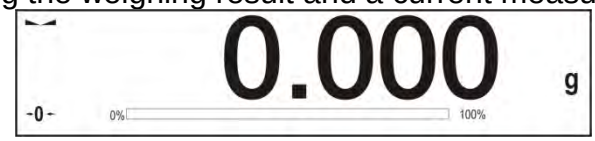
7. WEIGHING RESULT WINDOW



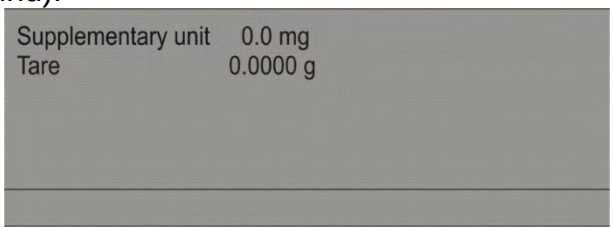
The home screen features 4 sections:

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

- Section presenting the weighing result and a current measuring unit.



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



CAUTION:
Data contained in this workspace is freely configurable. For detailed information on data configuration read section 14.4 of this user manual.

- Section comprising on-screen function buttons:

CAUTION:
The operator can define the on-screen function buttons. For detailed instruction read section 14.3 of this user manual.

8. LOG IN OPERATION

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

Log in operation:

- Go to home screen, press **<Log in>** button, wait for the operators database and **< Admin>** entry to open.
- Press **<** **Admin>** entry,
  Wait for the on-screen keyboard with a password box to open.
- Enter **„1111”** password and press button to confirm.
- The home screen is displayed, **<Log in>** sign is replaced by **<Admin>** sign.
- When logged, add operators and set permissions (for detailed procedure read section 11 and 12).

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

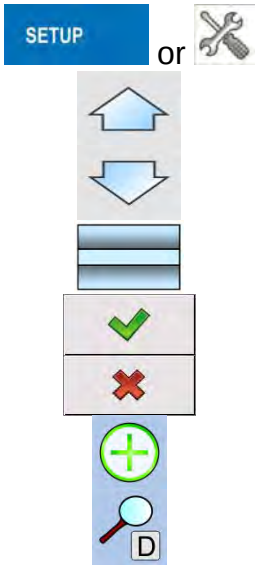
Log Out operation:

- Go to home screen, press logged operator name, wait for the operators database to open.
- Press **<Log out>** entry (1st position on the operators list).
- Home screen is displayed, admin name is replaced with **<Log in>** entry.

9. OPERATING THE MENU

Operation of module program menu is intuitive. The touch panel makes the software operation easy.
By pressing an on-screen button or any field, you activate respective function/operation.

9.1. Navigation



Press to enter the main menu

Press to scroll the menu 'up'

Press to scroll the menu 'down'

Press to scroll the menu 'up-down' fast

Press to confirm modification.

Press to exit, function remains unmodified

Press to add a new record to a database

Press to search for a particular record in a database by date

Press to search for a particular record in a database by name

Press to search for a particular record in a database by code

Press to print out a particular record from a database

Press to clear the editing field

Press to enable/disable an on-screen keyboard

Press to read printout template from a file format *.lb (function key is active on inserting a USB flash drive to terminal's USB port)

Press to select variables for a printout from a list

Press to move (exit) one level up

9.2. Return to the Weighing Mode

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

Procedure:

- Press button repeatedly, keep pressing until you see the home screen.
- Press button, the home screen is displayed immediately.

10. ADJUSTMENT

The module features 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 is displayed informing on the process status.

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 an external mass standard of the right accuracy and weight value, which value depends on weighing device model and capacity. The external adjustment procedure is a semi-automatic process, particular stages of which are signalled with on-screen prompts.

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

Procedure:

- Enter <Adjustment> submenu, next select <External adjustment> parameter.
- 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.
- Upon completed procedure, unload the weighing pan and press button to confirm. Balance returns to the weighing process.

10.3. User Adjustment

User adjustment can be carried out using any adjustment weight mass of which ranges between 0.15 Max and Max. User adjustment and external adjustment procedures are likewise with one exception, before user adjustment start, an edit box for entering mass of the used adjustment weight is opened.

CAUTION:
User adjustment is possible for balances that are not a subject to the conformity assessment (verification).

In order to start user adjustment, enter <Adjustment> submenu and select < User adjustment> option. Then follow the commands displayed on a screen.

10.4. Adjustment Test

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

10.5. 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 menu <Automatic adjustment time> (10.6),
- Temperature – adjustment is triggered by temperature change.
- Both – adjustment is triggered by both, temperature changes and time.

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

10.6. 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:

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

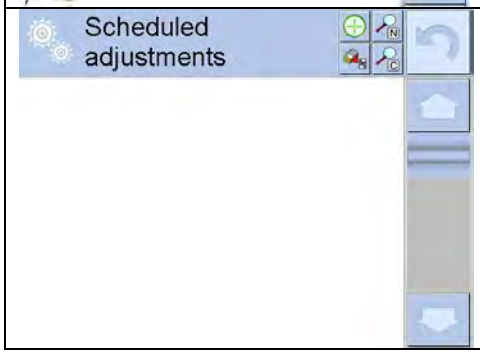
CAUTION:
This parameter settings can be modified only for balances that are not a subject to the conformity assessment (verification).

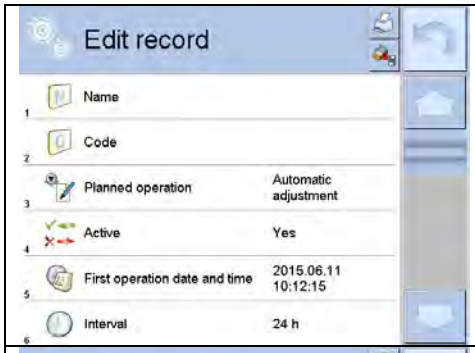
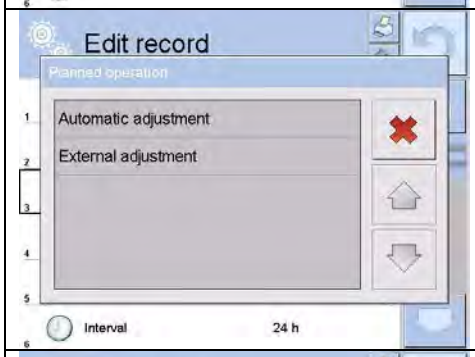
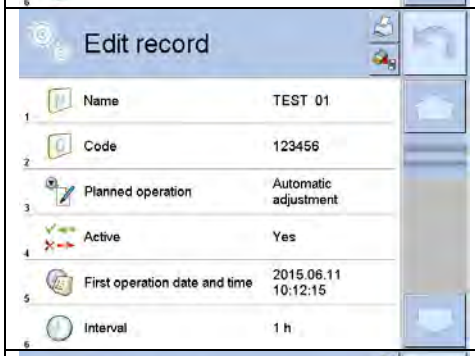
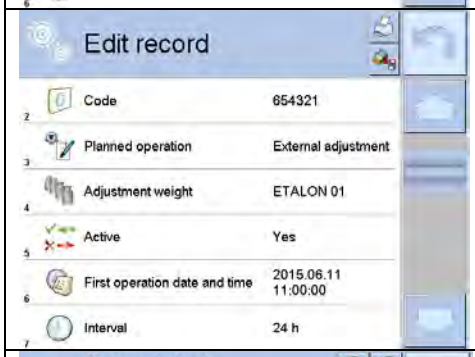
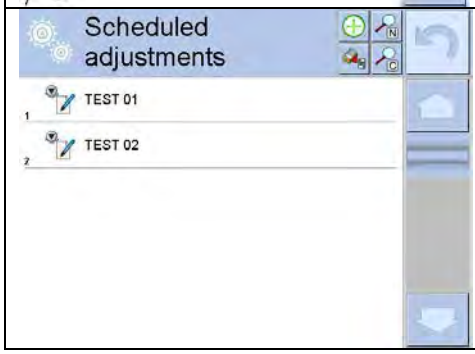
10.7. Scheduled Adjustments

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

Procedure:
Prior setting adjustment schedule, enter data of mass standards intended for external adjustment performance.

Enter operator menu, select <Adjustment> submenu and find < Adjustment weights> parameter. Enter weight data:

	Enter operator menu, select <Adjustment> submenu and find <Scheduled adjustments> parameter.
	Enter <Scheduled adjustments> parameter, wait for 'Scheduled adjustments' window to open, add adjustment procedures. Remember, only Administrator can add new entries.

	In order to add a new position, press button, wait for a window with data on 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.

10.8. Report Printout

Report printout> parameter determines whether or not an adjustment report is to be automatically printed upon adjustment process completion.
In order to set automatic report printout, go to Report printout> parameter and select <YES> value.

10.9. 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
- operator
- balance type
- balance S/N
- level status
- nominal mass
- current mass
- difference
- temperature
- empty line
- dashes
- signature
- non-standard printout

10.10. Adjustment History

Adjustment history contains data on all carried out adjustment processes. The record is carried out automatically. Each record on adjustment 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>, select adjustment to be printed. Upon displaying record details, press print key located on the top of the display.

CAUTION:
If the balance memory is full, 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
The module enables searching for a specific completed adjustment record. To do that, press search 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 balance's USB port. Press <Data export> button located on the top of the display. The process is fully automatic and on its completion a file with ***.db.*** extension is saved on a USB flash drive connected to the USB port.

11. OPERATORS

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

- Name
- Code
- Password
- Permissions
- Language
- Profile
- Card no.

New operator can be added by the Administrator exclusively.
Procedure:

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

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

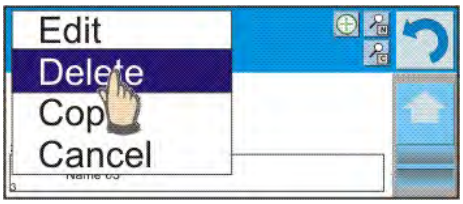
Editing data on an operator:

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

New operator can be deleted by the Administrator exclusively.

Procedure:

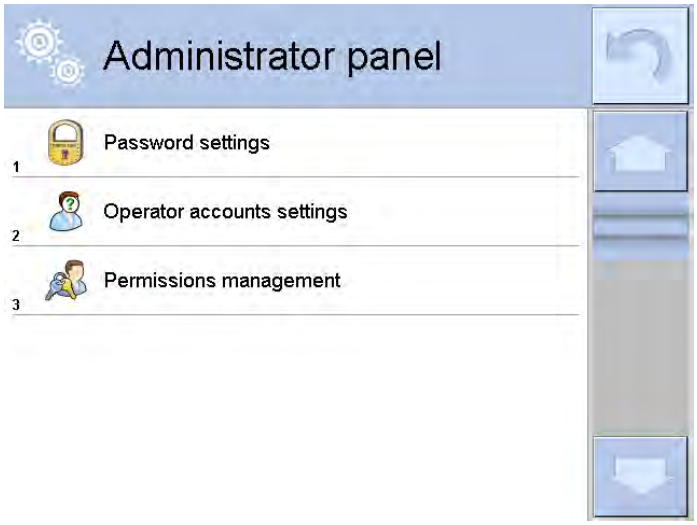
- Press and hold operator name.
- Wait to see a menu.
- Select <Delete> parameter.



12. ADMINISTRATOR PANEL

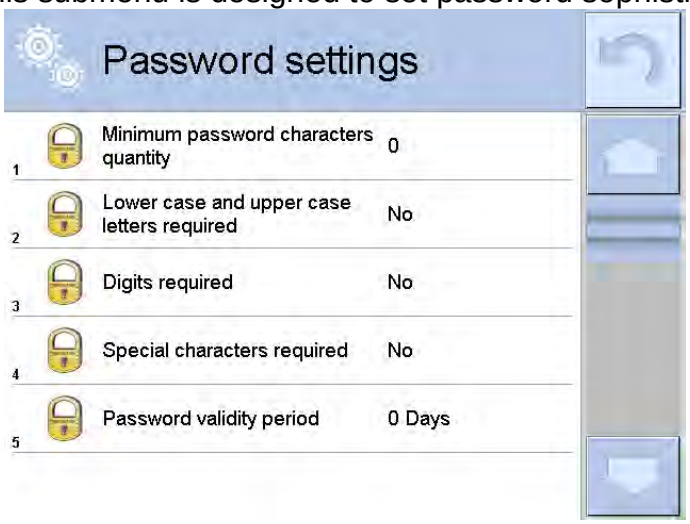
Administrator submenu is designed to set scope of operations for particular users assigned with given permissions, password protection level, and unlogged operator permissions.

Caution! *This menu can be modified only by an operator with administrator permissions level.*



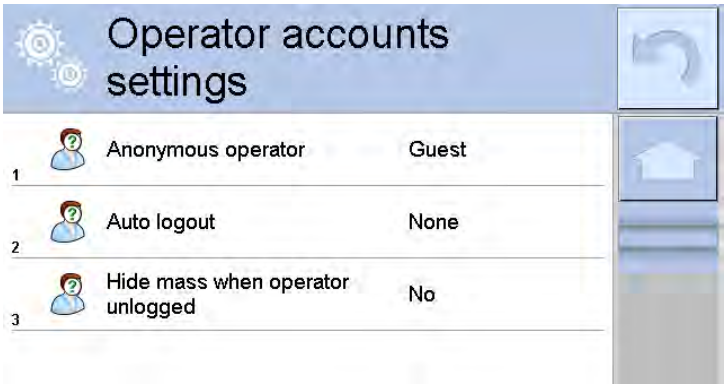
12.1. Password Settings

This submenu is designed to set password sophistication rate.



Minimum password characters quantity	Parameter for specifying minimum quantity of characters to be used in a password. „0” - set to enable password consisting of freely selected number 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	Setting time interval after passage of which the password expires. „0” - set to disable password request.

12.2. Operator Account Settings



Unlogged operator permissions
Administrator can assign an unlogged balance operator (so called anonymous operator) with permissions level.

Procedure:

1. Enter <Permissions> submenu.
2. Select <Anonymous operator> parameter.
3. Set respective permissions: Guest, Operator, Advanced operator, Administrator.

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

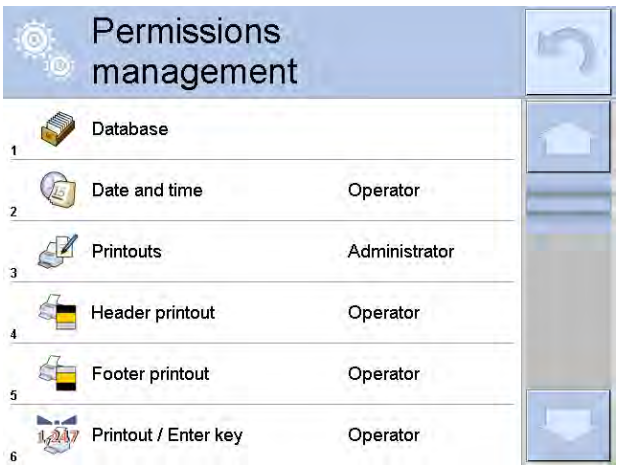
Auto logout
With Auto logout function on, the operator is logged out automatically if the balance is not operated within a specified time interval, given in minutes.
By default the function is off (<None> value set).

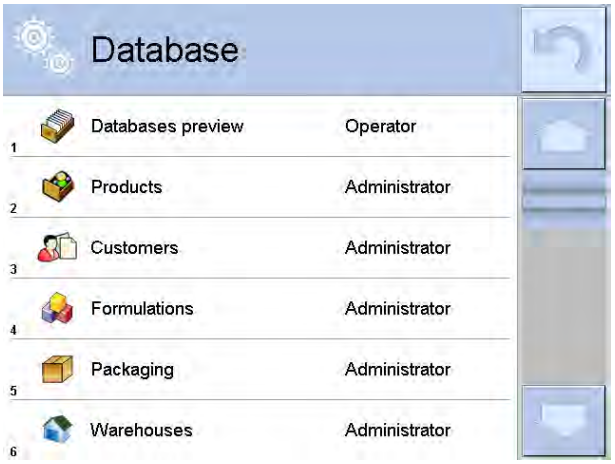
Procedure:

1. Enter <Permissions> submenu.
2. Select <Auto logout> parameter.
3. Set respective value: none/3/5/15/30/60. Time given in [min].

12.3. Permissions Management

Databases





Default balance settings enable operator who is logged as **Administrator** to modify settings of particular databases. The software allows Administrator to change permissions level, and as a result authorize other operators to modify settings of databases.

Procedure:

1. Enter <Administrator panel> submenu.
2. Select <Databases> parameter.
3. Set respective permissions for particular databases: Guest, Operator, Advanced operator, Administrator.

   Caution! *When* ***<Guest>*** *option is set, <Database> parameter is freely accessed (there is no need to log in).*

Date and Time

Default balance settings enable operator who is logged as Administrator to modify date and time parameter. The software allows to change permissions level, and as a result authorize other operators to access < Date and time> parameter.

Procedure:

1. Enter < Permissions> submenu.
2. Select < Date and time> parameter.
3. Set respective permissions: Guest, Operator, Advanced operator, Administrator.

   Caution! *When <Guest> option is set, <Date and time> parameter is freely accessed (there is no need to log in).*

Printouts

Default balance settings enable operator who is logged as Administrator to edit printouts. The software allows to change permissions level, and as a result authorize other operators to access < Printouts> parameter.

Procedure:

1. Enter < Permissions> submenu.
2. Select < Printouts> parameter.
3. Set respective permissions: Guest, Operator, Advanced operator, Administrator.

   Caution! *When <Guest> option is set, <Printouts> parameter is freely accessed (there is no need to log in).*

Value release

Default balance settings enable operator who is logged as User to edit printout templates. The software allows Administrator to change permissions level and as a result authorize other operators to access < Value release> parameter.

Procedure:

1. Enter < Permissions> submenu.
2. Select < Value release> parameter.
3. Set respective permissions: Guest, Operator, Advanced operator, Administrator.

   Caution! *When <Guest> option is set, <Value release> parameter is freely accessed (there is no need to log in).*

Videos
Default balance settings enable operator who is logged as Administrator to modify <Videos> submenu (add, delete files). The software allows Administrator to change permissions level, and as a result authorize other operators to access < Videos> parameter.

Procedure:

1. Enter < Permissions> submenu.
2. Select < Videos> parameter.
3. Set respective permissions: Guest, Operator, Advanced operator, Administrator.

Caution! *When <Guest> option is set, <Videos> submenu is freely accessed (there is no need to log in).*

13. PROFILES

A Profile is a data pack that determines:

- 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).

To simplify weighing instrument operation, there are 4 profiles in the software. The profiles are selected and saved so that the weighings for respective requirements and conditions are optimized.

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 get activated automatically,
- **Precision** – profile set to enable precise measurement of mass of any size regardless of the selected working mode. For Precision 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 get 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

Default profile: <Home>. 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 **Setup** key.
- Enter <Profiles> submenu.
- Press and hold profile that is to be copied.
- Menu referring to a profile record is displayed. Select <Copy> parameter.
- A new <Copy *name*> profile is created, new profile settings and base profile settings are identical.
- Modify necessary data: (name, etc.).

Adding a new profile

Procedure:

- Enter main menu, to do it press **Setup** key.
- Enter <Profiles> submenu.
- Press button, message box: <Create new record?> is displayed.
- Press button to confirm. The software automatically adds a new record and enters its editing mode.

Deleting a profile
Procedure:

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

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

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).

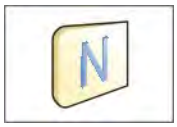
Working modes — Contains the following submenus:
- Additional settings of a working mode
- Control
- Information
- Printouts

Readout — Contains the following submenus:
- Filter
- Value release
- Autozero

- Autozero: Dosing
- Last digit

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

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

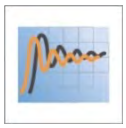
Upon entering Working Modes parameter, a window containing all accessible working modes is displayed. Parameters are set for each working mode independently. Particular profile when activated runs with given set of parameters.

You can enter the following data for each working mode:

- Settings:
  contains specific parameters relating to a working mode and universal settings, such as: result control, tare mode, automatic footer printout, printout mode, printout.
- 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

The function enables you to adjust balance operation to ambient conditions (filter settings) or your individual needs. <Readout> menu contains the following elements:



FILTER (function unavailable for the following profiles: Fast, Fast dosing, Precision)
Each measurement signal before being displayed is electronically processed in order to provide correct parameters specific for stable measurement result, i.e. ready to read.

You can determine signal processing rate, there are five different filters for you to select from. Range:

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

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

CAUTION:

- *for precision balances set: very fast ÷ or average filter,*
- *for analytical balances and microbalances set: ÷ very slow filter.*

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

There are three different settings for value release parameter:

- 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 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.
Accessible settings: **NO** - autozero function disabled
YES - autozero function enabled

Autozero function: Dosing (function unavailable for the following profiles: Fast, Fast dosing, Precision)
The function has been designed to set autozero to default value selected for dosing.
Available values:
NO - autozero operation is automatically disabled on entering dosing mode.
YES - autozero operation is automatically enabled on entering dosing mode.

Last digit
The function has been designed to enable/disable visibility of the last decimal place of measurement result. Accessible settings:

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

Ambient Conditions
Parameter relating to ambient and environmental conditions of the workstation. For unstable ambient conditions it is advisable to set the parameter to value: Unstable. Default value: Stable.
Setting 'Stable' value results with faster operation, i.e. weighing takes much less time than in case of setting the parameter to value: Unstable.

- **Unstable; Stable.**

13.2.4. Units

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

A custom measuring unit features:

- o a multiplier
- o a name (3 characters)

Upon completed operation of designing a custom unit, its name is added to the list of accessible measuring units.
Units menu enables you to enteri the value of gravitational acceleration force characteristic fora place of use. It is obligatory should a mass comparator be used to determine mass in [N].

14. WORKING MODES – General Information

Standard 4Y series features the following working modes:

Weighing	**Parts counting**
Means of operation: weight of a load is determined through an indirect measurement. The balance measures gravitational force which attracts the load. The obtained result is processed and displayed on the balance screen in a digital format.	Means of operation: based on a weight value of a single piece it is possible to count pieces quantity; necessary conditions: the weight value of a single piece is determined with sufficient accuracy, the mass of all the pieces is the same.
Checkweighing	**Dosing**
Means of operation: control of sample's mass carried out with reference to specified thresholds, it is necessary to give the value of min threshold <LO> and max threshold <HI>.	Means of operation: it is necessary to specify sample's target mass to be obtained by dispensing (pouring, filling, etc.).
Percent weighing:	**Density**
Means of operation: control of percent ratio of a test sample in relation to a reference sample. Obtained data provides info on how much the test sample differs from the adopted reference sample.	Means of operation: based on Archimedes principle it is possible to determine density of solids and liquids. Density mode requires use of an optional density determination kit.
Animal weighing	**Formulations**
Means of operation: mass measurement carried out with use of filters which dampen animal moves on a weighing pan; the filters enable obtaining correct measurement result.	Means of operation: by mixing specified ingredients you can obtain particular mixture; in order to program given formulation it is necessary to give mass values for respective ingredients.

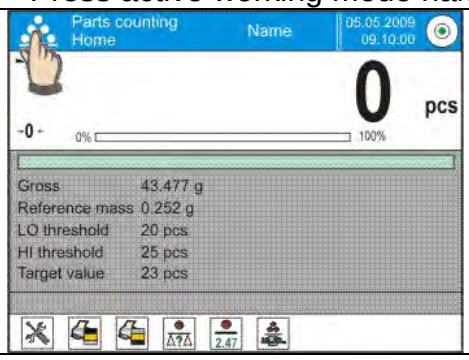
Statistics	**Pipettes calibration**
Means of operation: carried out measurements are used to calculate statistical data, e.g. Min, Max, deviation etc.	Means of operation: Means of operation: calibration of pipettes according to procedures listed in ISO 8655 or according to user requirements.
Differential weighing	**Statistical Quality Control**
Means of operation: analysis of mass sample change over time.	Working mode is intended to carry out different types of product packing processes and aimed at monitoring and/or controlling the packing process. It enables detecting excess or lack of product quantity in a packaging.
Peak Hold	
Means of operation: max temporary indication occurring in the course of the weighing process is held on a display.	
Pre-Packaged Goods Control	**Mass Control**
Control of pre-packaged goods in accordance with regulation *on pre-packaged goods* *(function disabled for standard balance models)*	Working mode intended to carry out quick statistical control of samples in accordance with the requirements on a quality system and/or internal standards *(mode not available in balance's standard version).*

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

14.1. Running Working Mode

To run working mode other than currently operated one:

- Press active working mode name

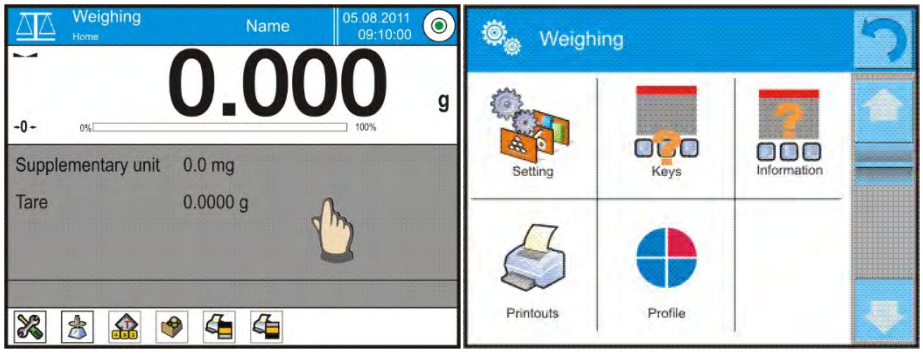
	•List of working modes is displayed. •Select the mode that is to be operated.

14.2. Working Mode Parameters

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

1. Press grey workspace area.
2. The following menu is displayed:
   - <Settings> - additional options.

- <Keys> - defining quick access buttons.
- <Information> - selecting information to be displayed in the workspace.
- <Printouts> - selecting printout type and content.
- <Profile> - selecting a profile to be active in the course of operation .

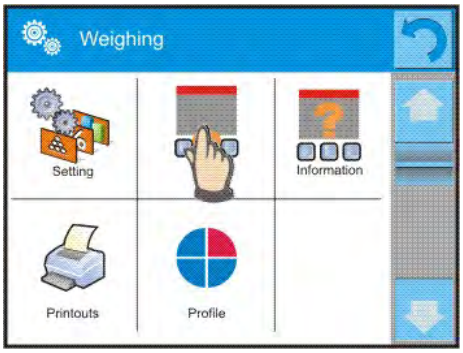
3. 

4. Enter particular submenu and select the component that is to be modified.

For detailed information on parameters of <Settings> menu go to section 15.7 *Additional Parameters for a Weighing Process*. For detailed overview of particular mode's parameters read section providing information on the mode in question.

14.3. Quick Access Buttons, Proximity Sensors

You can define up to 7 quick access buttons, which are to be displayed in the bottom bar. Upon assigning a function to a button, a corresponding pictogram is displayed in the bottom navigation bar of the home screen. Each working mode features customized set of buttons. For complete buttons list read Appendix B.



Caution: *You can view user manual saved to balance memory. In order to take advantage of this function add* *help button to a tool bar..*

14.3.1. Proximity Sensors

The balance features two proximity sensors enabling touch-free module control.
The program detects four motions performed around the sensors:

1. Hand in a close vicinity to the left sensor <**Left sensor**>.
2. Hand in a close vicinity to the right sensor <**Right sensor**>.
3. Hand motion to the left over both sensors (move your hand over right sensor first, left next) <**Proximity sensor: gesture to the left**>.
4. Hand motion to the right over both sensors (move your hand over left sensor first, right next) <**Proximity sensor: gesture to the right**>.

Caution:
Using GESTURE TO THE LEFT or GESTURE TO THE RIGHT, it is necessary to remember that <Proximity sensors delay> parameter must be set to value: **500 ms**!
List of operations to be assigned: None; Profile; Adjustment; Zeroing; Taring; Tare setting; 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 34 ‘Proximity sensors sensitivity’).

14.3.2. Automatically Opened Door

Settings for devices equipped with auto door opening and closing mechanism, MYA 4Y and XA 4Y.A series balances. The settings concern quick access buttons and proximity sensors.

MYA 4Y series balance settings:

- **Open/Close door** – parameter for changing door state; e.g. door closing when the weighing chamber is opened, and door opening when the weighing chamber is closed.
- **Left door** – changing position (open/close state) of door on the left side of the weighing chamber.
- **Right door** – changing position (open/close state) of door on the right side of the weighing chamber.

XA 4Y.A series balance:

- **Open** – weighing chamber door opening.
- **Close** – weighing chamber door closing.
-
- **Open/close door** – parameter for changing door state; e.g. door closing when the weighing chamber is opened, and door opening when the weighing chamber is closed.

To swap from manual to automatic door opening mode in XA 4Y.A balance:

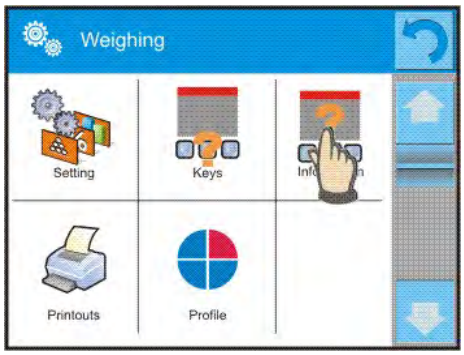
1. Turn the door knob 180˚ either left or right.
2. Using your hands slide the door, both left and right, from the front to back thus making them couple the mechanism.

Door coupling is easy to be sensed (the pawls get engaged with the notch). To return to manual operation, turn the knob to its previous position.

14.4. Information

Information on weighing process is displayed in the grey workspace. The workspace can contain up to 6 data. If larger amount of data is selected, then only the first 6 are displayed. Each parameter features two options:

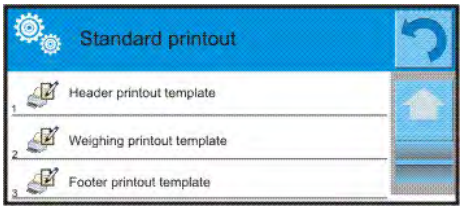
- YES, information enabled (displayed in the workspace).
- NO, information disabled.



14.5. Printouts

Printouts menu comprises two separate sections:

- standard printouts,
- non-standard printouts.



Standard printout

Standard printout comprises three internal sections containing different variables. YES value - variable printout enabled, NO value - variable printout disabled.

Procedure:

1. Press field with name of a template to be edited (Header – Weighing – Footer) and select variables to be printed.
2. If a printout is a non-standard one, create it.

HEADER	WEIGHING	FOOTER
– Dashes – Working mode – Date – Time – Balance type – Balance S/N – Operator – Level status – Customer – Warehouse – Product – Packaging – Universal variable 1 … 5 – Empty line – GLP report – Non-standard printout	– N (measurements quantity) – Date – Time – Level status – Customer – Warehouse – Product – Packaging – Universal variable 1 … 5 – Net – Tare – Gross – Current result – Additional unit – Mass – Non-standard printout	– Working mode – Date – Time – Balance type – Balance S/N – Operator – Level status – Customer – Warehouse – Product – Packaging – Universal variable 1 … 5 – Dashes – Empty line – GLP report – Signature – Non-standard printout

HOW TO OPERATE PRINTOUTS

1. In order to print WEIGHING section variables press PRINT button on balance's panel, only variables with attribute YES can be printed (see the above list).

2. Variables with YES attribute present in the HEADER and FOOTER are printed **ONLY** upon pressing **PRINT HEADER** and **PRINT FOOTER** pictograms. The pictograms have to be added to the bottom bar of the display, as quick access buttons.

(For detailed instruction on how to add quick access buttons to the bottom bar of the display go to section 14.3)

Print header data	Print footer data

CAUTION:

Measuring units for mass indication:

- *Net – the main measuring unit (adjustment unit)*
- *Tare – the main measuring unit (adjustment unit)*

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

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

Procedure:

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

CAUTION:

- *It is possible to add a printout by importing configured texts from flash drives connected to balance's USB port.*
- *Printout's name is ONLY a NAME, and it is not part of its content.*
- *For information on how to design a non-standard printout template read section 30.19 Printouts.*

14.6. PROFILES

Profiles function has been described in section 13 *Profiles*.

15. WEIGHING

Load the weighing pan. Wait for a stable indication (display of stability marker, ◣◢) and read the measurement result.
Record/printout of the measurement result is available on pressing <PRINT> key:

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

15.1. Weighing Unit Selection

Change of weighing 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:

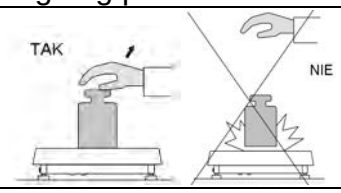
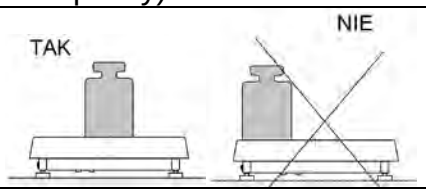
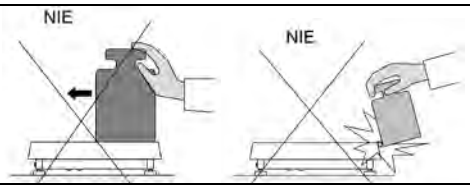
unit	*denotation*	*verified balance*	*unit*	*denotation*	*verified balance*
gram	[g]	yes	Taele Hongkong	[tlh]	no
milligram	[mg]	yes*	Taele Singapore	[tls]	no
kilogram	[kg]	yes*	Taele Taiwan	[tlt]	no
carat	[ct]	yes*	Taele China	[tlc]	no
pound	[lb]	no	Momme	[mom]	no
ounce	[oz]	no	Grain	[gr]	no
ounce Troy	[ozt]	no	Newton	[N]	no
pennyweight	[dwt]	no	Tical	[ti]	no

** - units accessibility is conditioned by the weighing instrument type.*
For unverified weighing instruments all non-SI units are available.

15.2. Good Weighing Practice

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

- Start the balance with no load on the weighing pan (permissible value of load on the weighing pan at start is ±10% of the maximum capacity).

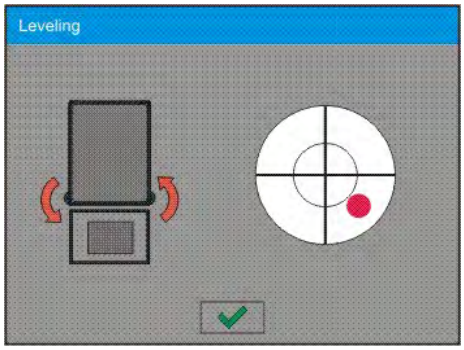
	
Load the weighing pan steadily avoiding shocks	Place weighed loads centrally on the weighing pan
	
Avoid side loading, in particular side shocks	

15.3. Levelling

The balance is equipped with an LevelSENSING System which enables monitoring of the balance level. Level monitoring is performed uninterruptedly in the course of balance operation. Level status is signalled with a respective pictogram, displayed in the upper right corner of the work panel. The system monitors balance level state and on detecting any change the position of level marker is displayed on the screen and/or respective alarm is activated. Balance level setting proceeds.

Levelling procedure:

- Press level status pictogram located on the top of the display.
- Control panel of level function is displayed . Along with the level indicator, balance view is presented.



- Level the balance by turning its feet left/right, follow the blinking pictograms, <> – press to make level marker move toward the centre of the circle.
- When the marker takes central position, its colour turns from red to green – the balance is correctly levelled.

Caution: *The balance is equipped with Automatic Level Control mechanism. For detailed information regarding the mechanism operation refer to section 34.8 of this user manual.*

15.4. Zeroing

To zero mass indication press key. Zero indication and the following pictograms are displayed: and . Zeroing operation means determining new zero point, recognized by the weighing instrument as precise zero. The instrument can be zeroed only when the indication is stable.

CAUTION:
*Indication can be zeroed only within **±2%** range of maximum capacity. If the zeroed value is above **±2%** of the maximum capacity, then the software indicates a respective **Err2** error message.*

15.5. Taring

To determine net weight value, load the weighing pan with a packaging, wait for a stable indication and press key. Zero indication and the following pictograms are displayed: ***Net*** and . Upon unloading the weighing pan, the sum of tared masses with minus sign is displayed. You can assign tare value to a particular product stored in the database. In such 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: ***Err3****. In such case, zero the indication and repeat taring procedure.*

Entering tare value manually

Procedure:

- Press 4 8 3 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.
- Balance returns to weighing mode. Tare value with „**–**" sign is displayed.

Deleting tare

The tare value indicated on the display can be deleted by pressing 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 ZERO key,
- the <Net> marker gets deleted, new zero point is determined.

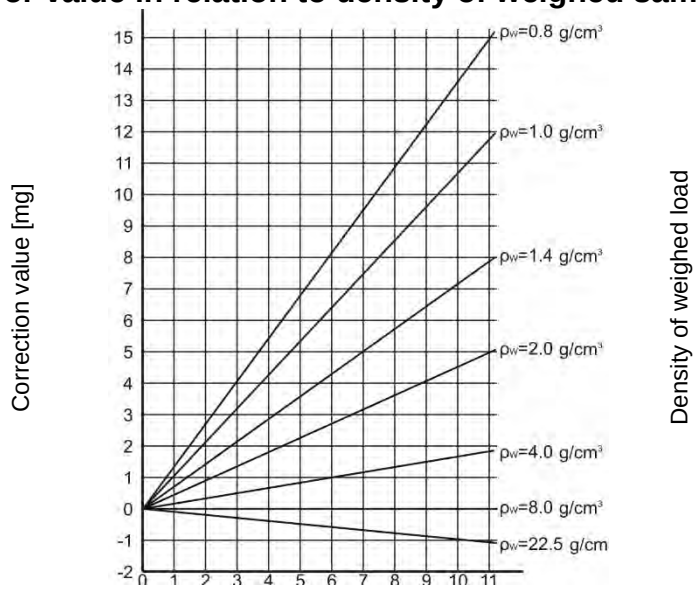
Procedure 2 - with tared load on the weighing pan:
- press ZERO key,
- the <Net> marker gets deleted, new zero point is determined.
- when the tare value exceeds 2% of the maximum capacity, -Err- message is displayed in order to inform you about the fact that operation cannot be carried out.

Procedure 3 - when the tared load is on the weighing pan or upon taking the tared load off the weighing pan:
- press < Deactivate tare> programmable button,
- the NET marker is deleted.
- the display indicates tare value.
- to restore the last tare value press < Restore tare> button.

15.6. Use of Air Buoyancy Compensation Factor

The application enables correcting mass measurement errors in the course of:
1. weighing loads of density considerably different from the density of standard that has been used to adjust the balance; typically the balance is adjusted with a steel mass standard with density ~8.0g/cm^3 or a brass mass standard with density ~8.7g/cm^3; if loads made of other substances are weighed, then ratio indicated on the graph below applies.

Error value in relation to density of weighed sample



The graph presents correction values for versus the density of weighed load, assumption that air density is constant and equals 1.2 kg/m^3 is taken.

2. testing sample mass change within a few hours long period of time for a case when the sample mass is relatively constant (minor changes). It is assumed that air density changes affect considerably the final result, wherein the density is influenced by changes of pressure, temperature and humidity.

In order to carry out a reliable measurement it is necessary to know the measuring methods, features of tested sample, ambient conditions, air density in the laboratory room and density of weighed sample.

FUNCTIONING

The air buoyancy compensation procedure is to be used as follows:

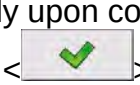
1. Method 1:
   Enter air density value and value of weighed sample density to balance's memory. Wait, the software automatically calculates the correction factor for weighed mass, next corrected value of weighed mass is displayed.
   In order to avoid mistakes, the corrected mass value is accompanied by <**!**> symbol, the symbol is visible on a display and a printout.
2. Method 2:
   Determine air density value with use of module program (semi-automatic operation) and enter value of weighed sample density to balance's memory.
   Determination of air density is carried out using a set of two mass standards, one made of stainless steel, and the other one of aluminium. Based on mass indications of the two standards, the software automatically calculates the air density and saves the value in balance's memory on operator's confirmation. Now, enter value of weighed sample density to balance's memory.
   Wait, the software automatically calculates the correction factor for weighed mass, next corrected value of weighed mass is displayed.
   The corrected mass value is accompanied by <**!**> symbol, the symbol is visible on a display and a printout.

In order to enable/disable the air buoyancy compensation procedure go to the user menu. The procedure is valid for weighing mode exclusively.

AIR BUOYANCY COMPENSATION START-UP

Procedure:

- Enter home screen and press grey workspace.
- Select <Settings> parameter.
- Select < Air buoyancy compensation> parameter.
  Parameter values:
  - Air buoyancy compensation – YES/NO.
  - Sample density (enter value of weighed sample density). If you use products from databases, then on product selection its density value is automatically uploaded.
  - Air density – parameter designed to enable you to select the method of entering the air density value.

Parameter values:
VALUE – select to open a window where you enter specified air density value (e.g.: determined by means of other methods). The entered value is used in the course of compensation. It is assigned automatically upon completed air density determination (to complete air density determination press <  > button).
ONLINE – select to make the balance acquire air density value from a connected THB sensor at a real time, if such is connected to the balance, or from internal sensor installed in the balance.
If your balance features both types of sensors (THB and internal), then data from the THB supersedes the other, in such case go to ***Setup/Ambient conditions/Ambient conditions module*** and set **SAVE or SAVE & ALERTS** parameter.
If your balance features only one set of sensors recording temperature, humidity and pressure, then correct ONLINE operation requires setting the following parameters:
- internal sensors exclusively – go to ***Setup/Ambient Conditions/Ambient Conditions Module*** and set NONE value,
- external THB sensor exclusively – go to ***Setup/Ambient Conditions/Ambient Conditions Module*** and set SAVE or SAVE & ALERTS value.
For correct balance cooperation with the THB sensor it is necessary to set port's transmission parameters, they must be compatible with those of the THB sensor. The THB sensor transmission parameters are detailed on its data plate.
On returning to the weighing mode, the display indicates an additional symbol **<!>**, as indicated on the figure below. From now on the value of indicated mass is corrected including the air buoyancy compensation factor and sample density.

The measurement result can only be compensated by a correct value if the operator enters the actual value of the air density and correct value of weighed sample density to balance's memory.
CAUTION:
If the <AIR BUOYANCY COMPENSATION> parameter is set to <ONLINE> parameter, then pictogram <!> is not displayed. This means that parameter ***Setup/Ambient Conditions/Ambient Conditions Module*** *is set to SAVE or SAVE & ALERTS value, and that there is no physical connection between a balance and a THB module, or that balance-module communication parameters are incorrect. In such case plug the module to balance's ports COM 1 or COM 2 and set appropriate communication parameters, for the parameters refer to a data plate.*

15.7. Additional Parameters for a Weighing Process

Modification of weighing functions enables programming balance operation.

Procedure:

- Press grey workspace area.
- The following submenus are displayed: Settings, Buttons, Information, Printouts, Profile.
- Select submenu, press it, select submenu item that is to be modified.

<Settings> - additional options related to weighing mode,

<Keys> - defining quick access buttons,

<Information> - supplementary data on weighing process displayed in an Info field,

<Printouts> - selecting printout type,

<Profile> - selecting profile that is to be active during balance operation,

<SETTINGS> - weighing process related data such as:

- **Tare mode**

  Available options:

  - SINGLE:
    mass value saved to balance memory on single pressing of TARE key. Subsequent pressing of TARE key determines new tare value. Selecting product or packaging to which tare value is assigned causes automatic deleting of previously assigned tare value.
  - CURRENT SUM
    total value of currently entered product and packaging tare values (result of selection of product and packaging from the database) with possibility to add tare value entered manually. When new tare value for a product or packaging is set again then tare value entered manually gets deactivated.TOTAL SUM
    total value of all entered tare values.
  - AUTOTARE:
    <u>Means of operation:</u>
    Each first stable measurement result is tared. NET sign is displayed. Now you can determine net mass of weighed load. Upon unloading the weighing pan and autozeroing, tare value is automatically deleted

- **Automatic footer printout**

  Available options:

  MODE – None – manual footer printout,
  Sum of measurements – footer is printed when mass value entered in <Threshold> parameter gets exceeded.
  Measurements quantity – footer is printed when a pre-defined measurements quantity (a batch) set in parameter <Threshold> is carried out.

  THRESHOLD – setting the threshold value determining footer printout.
  For <Sum of measurements> parameter, threshold value is determined in measuring unit [g], for <Measurements quantity> parameter the unit is not determined, the provided value specifies carried out measurements quantity.

- **Printout/Enter mode**
  - PRINT/RELEASE BUTTON (manual operation)

    Never – printout disabled.
    First stable – first stable measurement is recorded.
    Each stable – all stable measurements are registered.

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

- AUTOMATIC MODE

Never – printout disabled.

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

Last stable - last stable measurement, registered prior unloading, is recorded. The record takes place only if the following conditions are met: weighing pan gets unloaded, measurement value lower than value of set threshold is displayed

With interval – select this value to start automatic printout and record of indications in WEIGHINGS database, carried out in a cyclic manner in a specified time intervals. The interval is set in [min] in <INTERVAL> parameter. Interval range is 1 - 9999 min.

CAUTION:
Each weighing result is printed and recorded (stable and unstable for a non-verified balance, stable for a verified balance).
Automatic operation with interval starts at the moment of switching the function on. The first stable weighing result of value greater than THRESHOLD value is printed and recorded as the first measurement. The following measurements are printed with frequency set in INTERVAL parameter. To stop the automatic operation with interval, switch the option off.

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

– **Printout**

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

Available options:

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

Caution: *For detailed instruction refer to section 14.5 of this user manual.*

– **Air buoyancy compensation**

Parameters allowing you to switch on the compensation and to enter weighed sample density data and air density data.

CAUTION:

Function valid for weighing mode exclusively.

For detailed information regarding the operation and settings refer to the previous section of this user manual.

15.8. Minimum Sample Weight

Weighing mode settings comprise <Minimum sample weight> function. In order to use the function it is necessary to enter data related to minimum sample weight determination methods and minimum sample weight values for a given method. The data must be entered to < Minimum sample weight> database. The database is empty in standard balance version.

Determining minimum sample weight and adding data to the: <Minimum sample weights> database can be carried out by an authorized "RADWAG" personnel exclusively.

Should you use the minimum sample weight function, and need data on minimal sample weight to be entered to balance menu, please contact the local representative of "RADWAG" company. Using reference weights, the authorized RADWAG employee determines minimum sample weight for specified tare containers. This operation is carried out at the place of use and in accordance with requirements of the applied quality system. The obtained values are entered to balance software: <Minimum sample weights> database. For a particular method of minimum sample weight determination, it is possible to define few tare values along with values of minimum sample weights, expiry dates of the carried out measurements and entered data. The settings are not to be edited by a balance user. <Minimum sample weight> function guarantees that the results of weighing operation are comprised within the set tolerance, in accordance with applied quality management system of particular company.

CAUTION: Function valid for weighing mode exclusively.

Available options:

- METHOD
  Option allowing you to select used quality standard. Press METHOD field to open a window with a list of database-stored methods by means of which the minimum sample weights were determined. In order to add a new method enter <Databases /Minimum sample weights>.
- MODE
  Block – select to display pictograms informing you on status of weighed mass (weighed mass below/above minimum sample weight) and to disable accepting the measurement result if it is below the minimum sample weight limit.
  Warn – select to enable display of respective pictograms informing you about the measured mass (whether it is lower than the MSW value or higher than the MSW value). You can accept the measurement that is lower than the MSW value. Mind that on a printout it will be preceded by an asterisk (*).

CAUTION:
For information on how to enter a method for minimum sample weight go to section 29.14 <Databases /Minimum sample weights> of this user manual. New minimum sample weight values can be entered by an authorized RADWAG personnel exclusively.

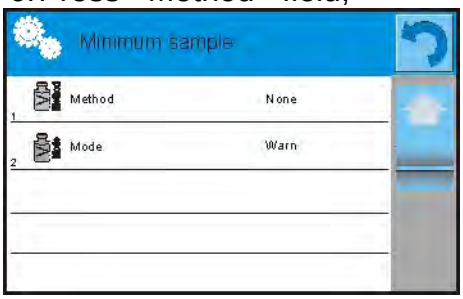
Weighing with use of <MINIMUM SAMPLE WEIGHT> function

If in the course of weighing you want to find out whether a particular measurement value is higher than the MSW value, specified for a given weighing range, then <Minimum sample weight> function must be on. To turn the function on go to weighing mode settings.

Procedure:

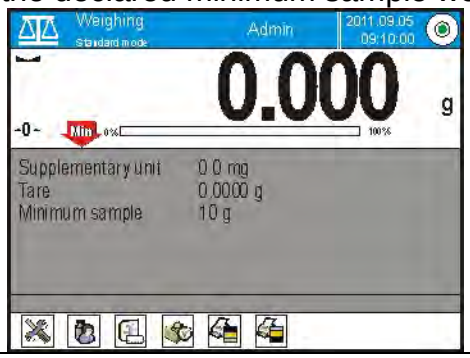
1. Press grey workspace area.
2. The following submenus are displayed: Settings, Buttons, Information, Printouts, Profile.
3. Select <Settings> menu - additional weighing process options.

4. Press <> Minimum sample weight> field.
5. Wait for Minimum sample weight window to open.
6. Press <Method> field,



window with a list of database-stored methods opens.

6. Select respective method.
7. Previous menu is displayed.
8. Press <Mode> parameter.
9. Settings box is displayed, select respective option:
   Block – select to display pictograms informing you on status of weighed mass (weighed mass below/above minimum sample weight) and to disable accepting the measurement result if it is below the minimum sample weight limit.
   Warn – select to enable display of respective pictograms informing you about the measured mass (whether it is lower than the MSW value or higher than the MSW value). You can accept the measurement that is lower than the MSW value. Mind that on a printout it will be preceded by an asterisk (*).
10. Set the parameters and exit the menu.
11. Section presenting the weighing result comprises additional pictogram providing supplementary information. The pictogram changes in the course of weighing operation, it informs you on the weighed sample mass; the information is referred to the declared minimum sample weight value.



Weight value lower than the MSW value specified for a particular tare range.	Weight value higher than the MSW value specified for a particular tare range.

Pictograms providing MSW-related information:

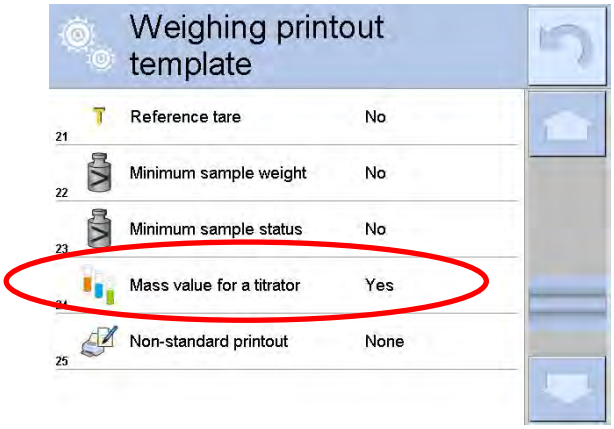
Min	Weight value lower than the specified MSW value.
OK	Weight value higher than or equal to the specified MSW value.
Min	Weight value lower than the specified MSW value. a pictogram with a clock informs on expiry of the minimum sample weight validity period (it is displayed two weeks before the determined expiry date).
OK	Weight value higher than the specified MSW value. a pictogram with a clock informs on expiry of the minimum sample weight validity period (it is displayed two weeks before the determined expiry date).

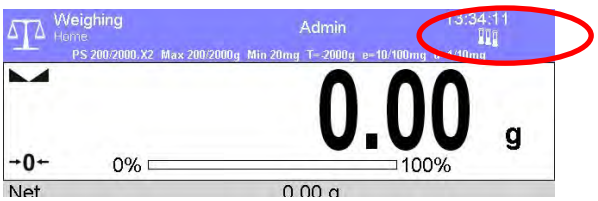
	The validity period of the minimum sample weight has expired. The minimum sample weight settings need to be modified. The minimum sample weight settings can be modified by an authorized RADWAG personnel exclusively.

CAUTION:
If more than one reference tare value is programmed (with corresponding minimum sample weight mass) then the indicated value automatically moves to a range corresponding to the weight of the tared container. At the same time the required minimum mass is changed.

15.9. Cooperation With Titrators

In order to provide correct cooperation with TITRATORS, go to settings of standard printout content and set <Mass value for a titrator> parameter to <Yes> value. With this, other variables for the printout are turned off.





The pictogram informs on special format of mass printout, permissible by TITRATORS.

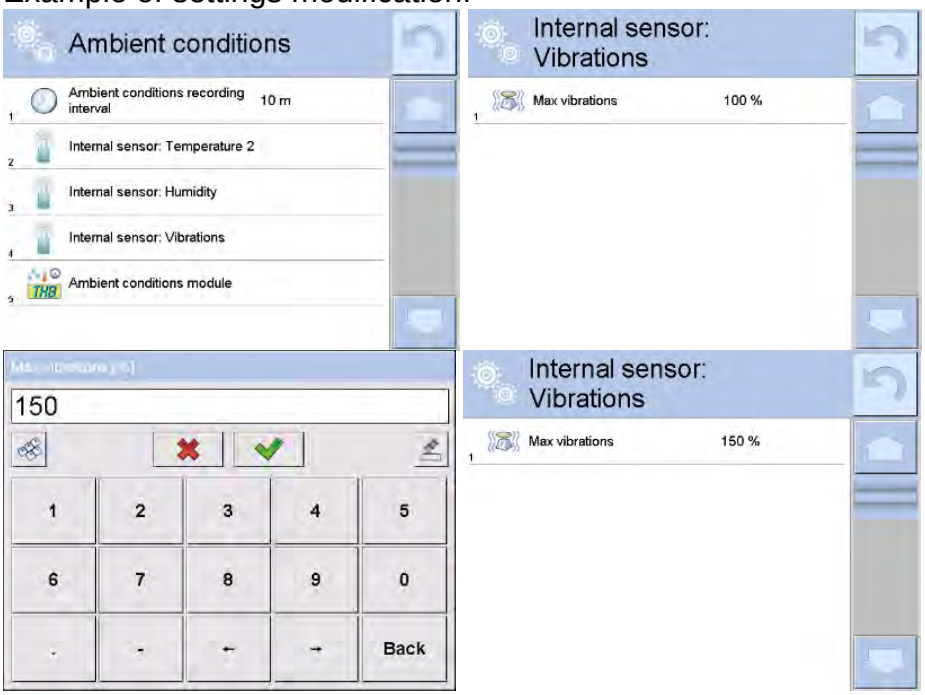
15.10. Ambient Conditions - Vibrations

Vibrations are a major cause of errors. Since the vibrations spread in all directions, the vibrations analysers and meters must carry out measurement in three axes concurrently. Ambient conditions module implemented in RADWAG balances of 4Y series features such option.
Analytical balances are precise weighing instruments therefore even insignificant oscillations influence their operation. Humans are most often unable to sense vibrations. In order to detect them, it is necessary to use special equipment. Vibrations sensor, along with a module that analyses the influence of the vibrations onto the measurement, informs the user in a real time on the possibility of occurrence of error caused by high-frequency vibrations. Usually the vibrations are dampened with use of anti-vibration tables. Signalling device, i.e. ambient conditions module equipped with a vibrations sensor, is used to support the process of vibrations dampening. Such device comes standard with each 4Y series balance. With use of the said signalling device it is possible to evaluate workstation conditions and if necessary to find more convenient place of use. It is often impossible to find a place where no vibrations occur, however the signalling device allows the operator to determine when and where to expect vibrations of the lowest-frequency.

Due to the following 3 factors: specified values of free vibrations, resolution, and permissible weighing instrument errors, the analysis must be carried out with regard to the right effective value (rms value) and bandwidth. Such analysis is performed on each 4Y series balance in a real time.
In case of the module that is in-built into balances manufactured by RADWAG, the filters analyse those frequencies to which the weighing devices are sensitive. In case of balances, effective value (rms value) measured from 3 axes and for a particular time interval is given, such value provides information on amplitude and history of disturbances.
Radwag has designed analysis method and selected permissible vibrations thresholds respectively to make signalling device operation both effective and convenient (not troublesome). Balance screen displays balance-registered vibrations level in percent.

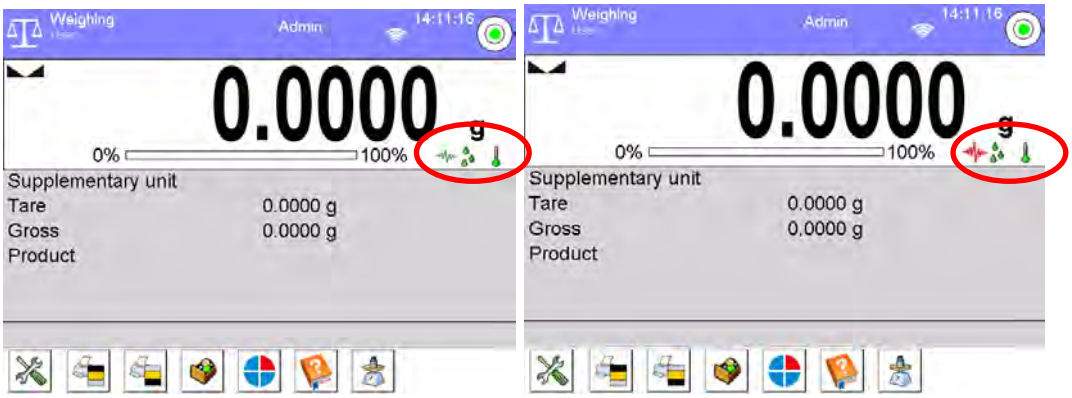
Vibrations threshold cannot be changed, however the operator can modify settings in a way ensuring that alerts are displayed in the most convenient way, depending on the needs. By default the set value is 100%.

Example of settings modification:

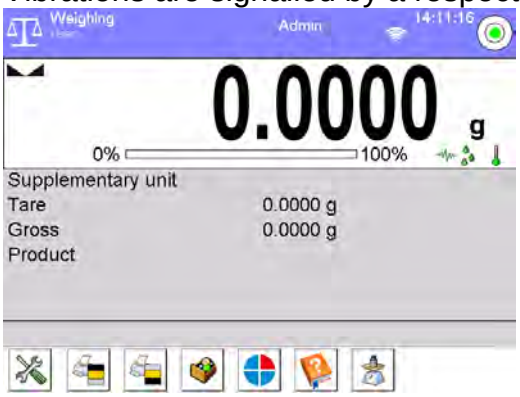


For better understanding, analyse the following example (the values used below are exemplary ones, they were not taken from the balance).

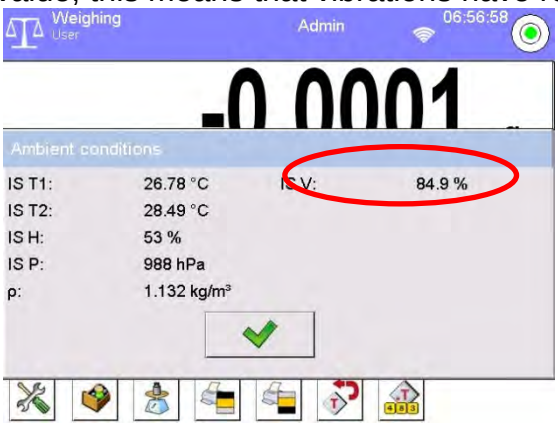
1. Assumed vibrations threshold set by default on 4Y series balance: 100mm/s^2.
2. Max vibrations value: 100% (threshold for alert display – pictogram colour change, from green to red). Pictogram colour is green for vibrations within 0 - 100mm/s^2 range, for vibrations value of 101mm/s^2, the pictogram changes to red.
3. Max vibrations value: 150%. Pictogram colour is green for vibrations within 0 - 150mm/s^2 range, for vibrations value of 151mm/s^2, the pictogram changes to red.



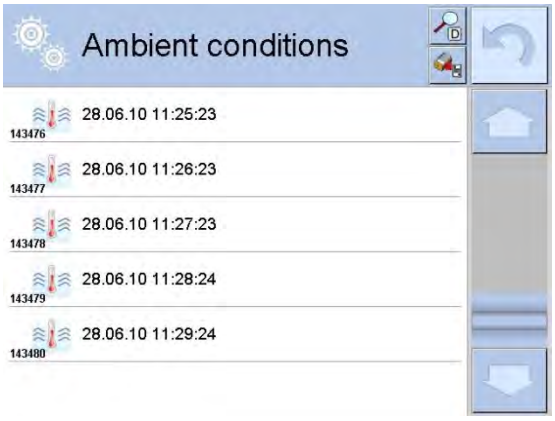
Vibrations are signalled by a respective pictogram displayed in the weighing result window.

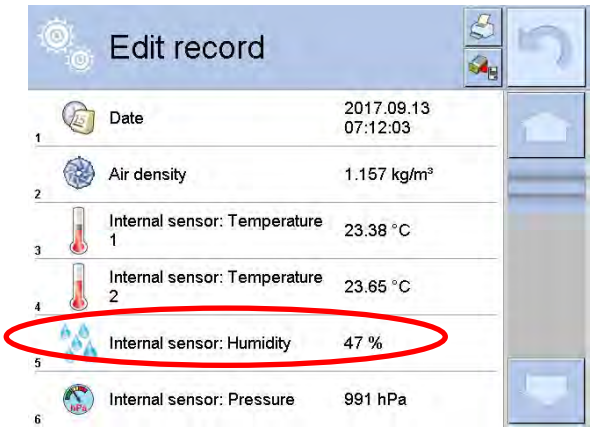


Upon pressing vibrations pictogram, window with current values measured by sensors is displayed. Displayed vibrations value (IS V) is the effective value registered within the most recent 2 seconds. This value id refreshed every 2 seconds. If the screen displays 100% value, this means that vibrations have reached threshold set by RADWAG.

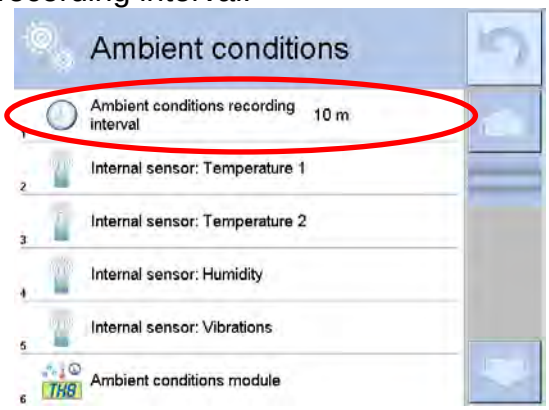


Vibrations are recorded in the database, this allows to analyse history of ambient conditions quality.



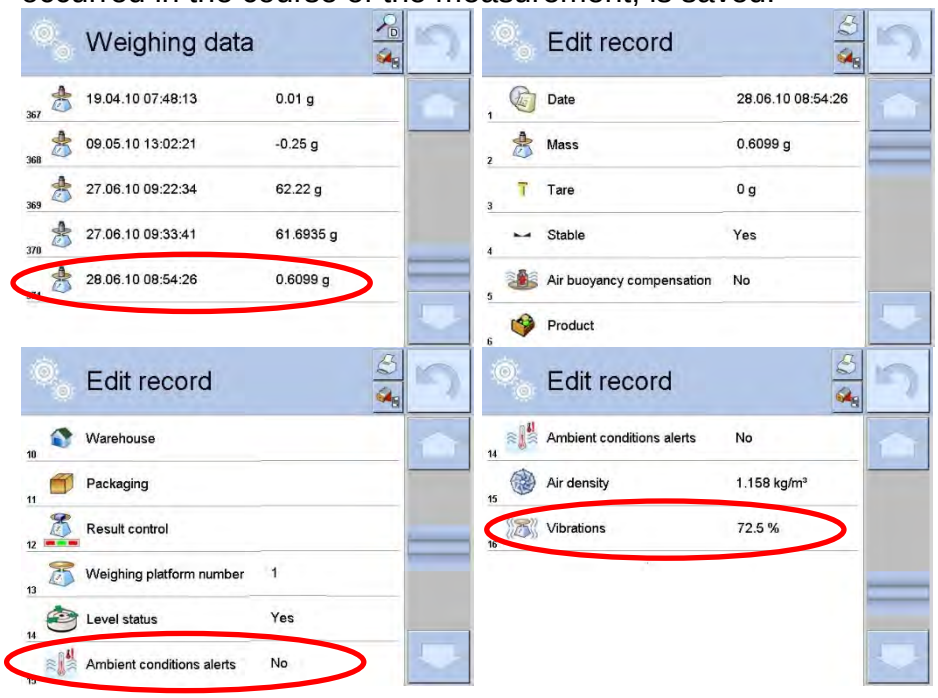


Effective value of vibrations registered by the balance over a declared time interval is saved (from the moment of the last record) – Setup/Ambient conditions/Ambient conditions recording interval.



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

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



16. PARTS COUNTING

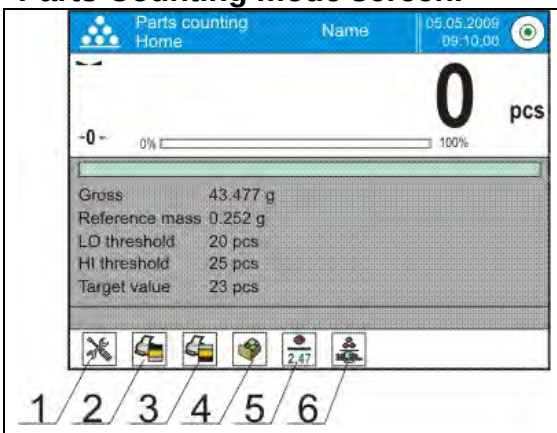
<Parts counting> is a working mode enabling you to determine quantity of small pieces of the same mass, which determination is done on the basis of reference weight value of single piece. The single piece weight value can be:

- determined using a reference quantity of parts subjected to weighing,
- acquired from database of products,
- entered manually as a numeric value.

Procedure for activation of Statistics mode:

- IGo to the home screen, press pictogram.<Working modes> submenu with list of working modes opens.
- Select < Parts counting> mode, the home screen is displayed automatically, it features pictogram.

Parts Counting mode screen.



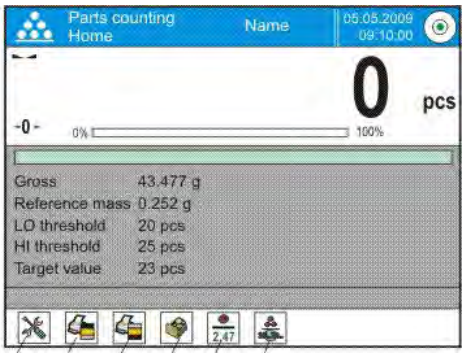
1. Setup – press to access balance menu.
2. Print header – press to print data declared in the header.
3. Print footer – press to print data declared in the footer.
4. Products database – press to select products from products database.
5. Set part mass – press to edit field for entering mass of a single part.
6. Determine part mass – press to set mass of a single part using reference sample comprising specified number of parts, e.g.: 10 pcs, 24 pcs, etc.

16.1. Mode Related Settings

The supplementary settings enable you to adjust the working mode to your needs and requirements.

Procedure:

1. Press grey workspace area, menu is displayed.
2. Press <Settings> parameter. List of functions related to Parts Counting mode is displayed:



Functions:

- **ACAI**, Automatic Accuracy Correction:
  - YES, weight value of a single piece to be updated,
  - NO, weight value of a single piece not to be updated.

Means of operation of ACAI function:

1. pieces quantity upon adding must increase,
2. pieces quantity upon adding cannot increase more than twice,
3. pieces quantity upon adding must be comprised within± 0.3 tolerance of total value.
4. the weighing result must be stable.

- **Minimum Reference Sample Mass**: 1 unit, 2 units, 5 units, 10 units; minimum mass value of a single piece. If this condition is not met, the counting process will not start.

- **Result control**
  - YES, set to print and save only those measurements which are comprised within the Lo and Hi thresholds.
  - NO, set to print and save all measurements.

- **Other functions in <Settings> parameter.**

To find out more about the remaining functions refer to section *15.7* of this user manual, *Additional Parameters for a Weighing Process*.

16.2. Parts Counting – Quick Access Buttons

Each working mode features automatically displayed set of default on-screen quick access buttons. The set can be modified by assigning out-of-list quick access buttons to the on-screen buttons. Such operation requires particular permissions.
You can select special quick access buttons that enable quick access to the determination of single piece mass on the basis of the reference mass of the following quantity:

16.3. Setting Reference Sample Mass by Entering Mass of a Single Part

Procedure:

- Press <2.47 Set part mass> button, <Reference sample mass> edit box featuring an on-screen keyboard is displayed.
- Enter respective value and press button for confirmation, <Parts counting> working mode is run with automatically set mass of a single part.

CAUTION:
If the value of entered single part mass is lower than 0.1 of the reading unit, then the following message is displayed: ***<Value too low>****.*

16.4. Setting Reference Sample Mass by Determining Mass of a Single Part

Procedure:

- Put the container on a weighing pan and tare it.
- Press button (Determine part mass), <Reference sample quantity> edit box featuring an on-screen keyboard is displayed.
- Enter respective value and press button to confirm. The following message is displayed: **<Number of parts to be loaded: xx>** (where **xx** – previously entered value).
- Load the weighing pan with declared amount of parts. When the indication is stable (pictogram is displayed), press button to confirm the mass.
- Single part mass is calculated automatically, <Parts counting> working mode is run and the weighing device displays quantity of single parts (**pcs**).

CAUTION:
Remember:

- *Total weight value of all parts loaded onto the weighing pan cannot be greater than the max capacity value.*
- *Total weight value of all parts loaded onto the weighing pan cannot be lower than the value determined by* ***<Minimum reference sample mass>*** *parameter. Unless this condition is met, the weighing instrument displays a message:* ***<Sample mass too low>.***
- *Single part mass value must be equal to or greater than* ***0.1 of the reading unit****. Unless this condition is met, the weighing instrument displays a message:* ***<Single part mass too low>.***

16.5. Setting Reference Sample Mass by Acquiring Mass of a Single Part from Database

Each product recorded in a database of products features set of information which allows to identify it. Among the information there is weight value used during parts counting process.

Procedure:

Enter <Parts counting> mode and press <Products> database. Select respective product from the list.

Entering reference sample mass to weighing device memory
Reference sample mass of a single part can be entered to products database.
Procedure:

1. Press <Setup> button, next press <Databases> entry and select Products database.
2. Press <Products> button.
3. Press respective product name and modify <Mass> field, [5].
4. Go back to <Parts counting> mode.

Procedure for entering single part mass to products database when there is no data entered yet:

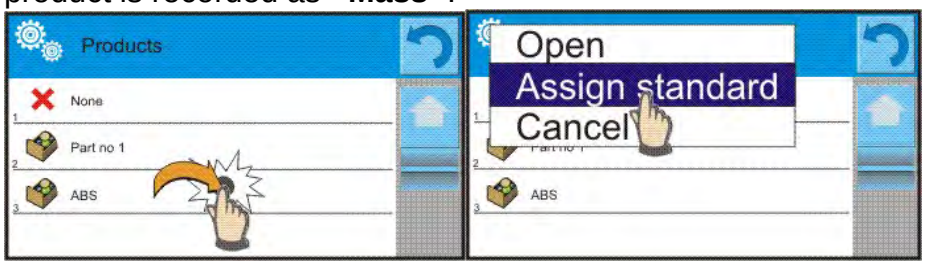
a) Press <Setup> button, next press <Databases> and select Products database.
b) Press < Add> button.
c) Fill in product-related fields and modify <Mass> field, [5].
d) Go back to <Parts counting> mode.

16.6. Single Part Mass Update in a Database

Determined single part mass can be assigned to a product in the database of products. This option is applied while using ACAI (Automatic Accuracy Correction) function in order to determine part mass with high accuracy.

Procedure:

1. Determine single part mass.
2. Press < Products> database.
3. Press and hold name of a product for which mass value is to be updated.
4. Context menu opens.
5. Press **<Assign reference sample mass>** button, reference sample mass for the product is recorded as **<Mass>**.



16.7. Parts Counting Procedure

First, it is necessary to obtain weight value of a single piece. Select one of the available options:

- Enter weight value for a single part (section 16.3), next put parts to be counted on the weighing pan, parts quantity is displayed.
- Determine mass of a single part from a given quantity of parts (section 16.4.). ACAI function pictogram is displayed (providing that the function is active). Next put parts to be counted on the weighing pan, parts quantity is displayed.
- Acquire weight value for a single part from the database (section 16.5). To do it, you have to select respective product. Now put parts to be counted on the weighing pan, parts quantity is displayed.

Caution: *It is necessary to tare any additional elements (packaging) prior to counting process start.*

16.8. Checkweighing for Parts Counting Mode

Parts counting process can be aided by checkweighing function, i.e. control whether indication is within the set thresholds.
Checkweighing requires setting values for two thresholds:

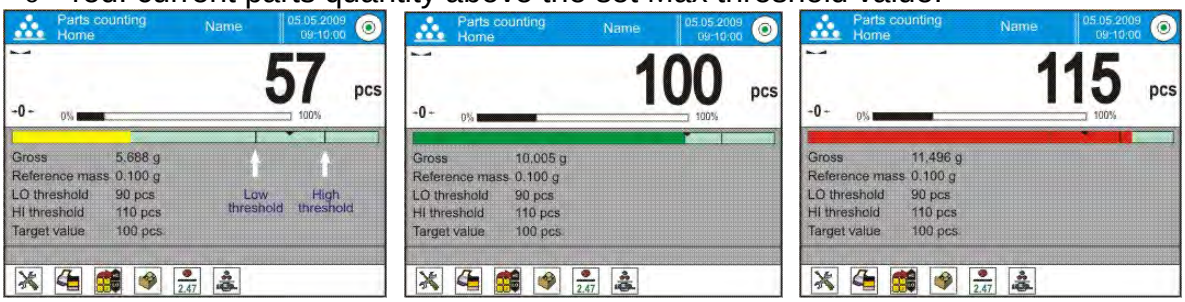
- Min threshold [Min= … pcs.]
- Max threshold [Max= … pcs.]

and setting YES value for Bar graph. The Bar graph displays relation: CURRENT PARTS QUANTITY/CHECKWEIGHING THRESHOLDS.
In order to define Min and Max thresholds' values open Products database and edit the Product record or use < Checkweighing thresholds> quick access button.

Procedure:

- Press grey workspace, next select <Information> parameter.
- Set Bar graph to YES value, return to parts counting mode.

- Press grey workspace, next select <Buttons> parameter.
- Assign <Checkweighing Thresholds> parameter to one of the quick access button.
- Return to parts counting mode.
- Press <Checkweighing thresholds> button and enter Min and Max thresholds values. Return to parts counting mode.
- Bar graph is displayed, its colour corresponds to the status of parts counting process.
  - yellow: current parts quantity below the set Min threshold value.
  - green: current parts quantity within the set thresholds.
  - red: current parts quantity above the set Max threshold value.

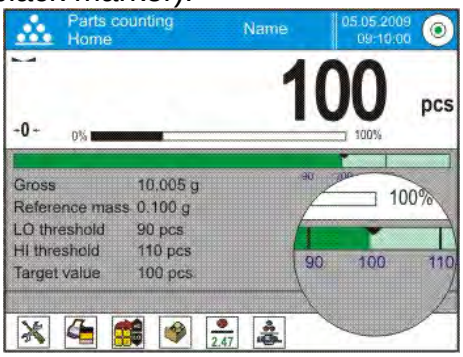


16.9. Dosing in Parts Counting Mode

Parts counting process can be aided by checkweighing function, i.e. control whether indication does not exceed the set target value.
Dosing requires setting a target value, e.g. 100 parts, and a % tolerance. The bar graph displays the target value as a bracket. In order to define target value press quick access button, <Target Value>.

Procedure:

- Press grey workspace, next select <Information> parameter.
- Set Bar graph to YES value, return to parts counting mode.
- Press grey workspace, next select <Buttons> parameter.
- Assign <Target value> parameter to one of the quick access button.
- Return to parts counting mode.
- Press <Target Value> key and enter value corresponding to parts quantity you want to have.
- If tolerance option is used, determine tolerance value (0 – 100%).
- Bar graph is displayed. It provides the following information:
  - current parts quantity on the weighing pan (indicated by means of colour – see section 16.7.),
  - target mass value (black marker).

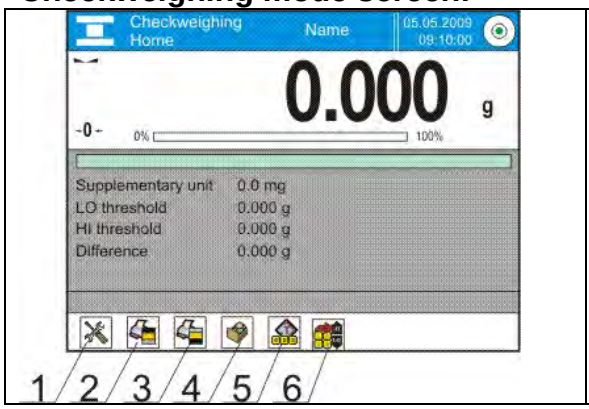


Caution: *The checkweighing and dosing functions can operate simultaneously in the parts counting mode. In such case the dosing tolerance is controlled by Min and Max thresholds of the checkweighing function.*

17. CHECKWEIGHING

<Checkweighing> is a working mode using two thresholds (Min and Max) for control of samples weight. Usually the weight is considered to be correct if it is comprised within threshold values.

Checkweighing mode screen:

	1. Setup – press to access balance menu. 2. Print header – press to print data declared in the header. 3. Print footer – press to print data declared in the footer. 4. Products Database – press to select products from products database. 5. Set Tare – press to enter tare. 6. Checkweighing thresholds – press to declare Min and Max threshold values.

17.1. Making Use of Checkweighing Thresholds

There are two methods for making use of the checkweighing thresholds:

- selecting product <> with Min and Max threshold declared,
- entering numeric value for the thresholds <>; in this case thresholds do not refer to any product.

Procedure 1 – selecting product from Products Database:

- Press button (Product database), list of products is displayed.
- Select the product that is to be weighed.
- The balance displays threshold values under the bar graph within the INFO area.
- Bar graph is displayed, its colour corresponds to the current status of mass:
  - yellow: mass value lower than Min threshold value,
  - green: mass value higher than Min threshold value and lower than Max threshold value,
  - red: mass value higher than Max threshold value.

Procedure 2 – entering checkweighing thresholds manually:

- Press button (Checkweighing thresholds).
- Press Min threshold button and enter its value.
- Press button to confirm.
- Press Max threshold button and enter its value.
- Press button to confirm.

Caution: *Max threshold value has to be greater than Min threshold value.*

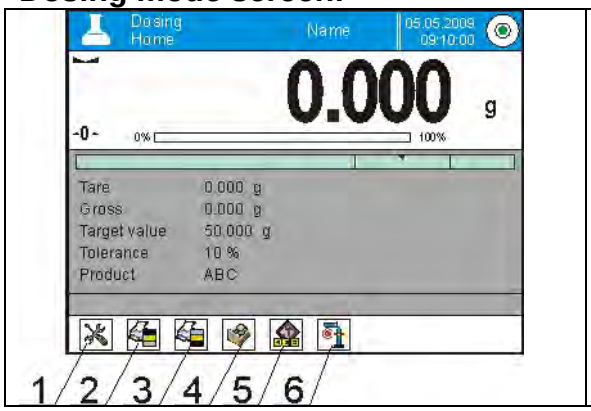
17.2. Mode Related Settings

To find out more about the remaining functions refer to section *15.7* of this user manual *Additional Parameters for a Weighing Process*.

18. DOSING

< Dosing> is a working mode that facilitates dispensing process, wherein the dispensing takes as long as it is necessary to obtain a pre-defined target weight.

Dosing mode screen:



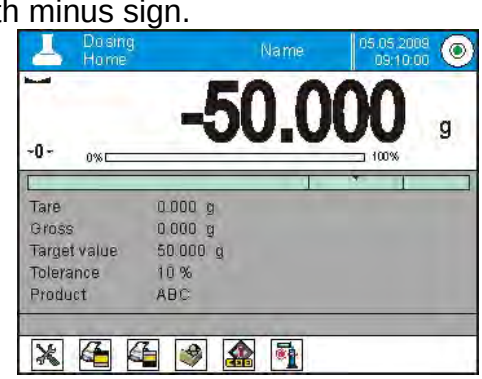
1. Setup – press to access balance menu.
2. Print header – press to print data declared in the header.
3. Print footer – press to print data declared in the footer.
4. Products Database – press to select products from products database.
5. Set Tare – press to enter tare.
6. Target value - press to declare target value.

18.1. Making Use of Products Database in the Course of Dosing Operation

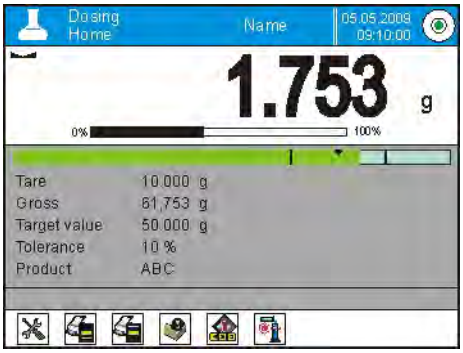
You can use target value assigned to a product or values recorded in **Product** Database. Additionally it is possible to define temporary target values. In case of Product Database the target value is value entered in the mass field.

Procedure 1 – selecting product from Products Database:

- Press button (Product database), list of products is displayed.
- Select the product that is to be weighed.
- Target and tolerance values are displayed automatically within the Info field.
- Target value is displayed with minus sign.

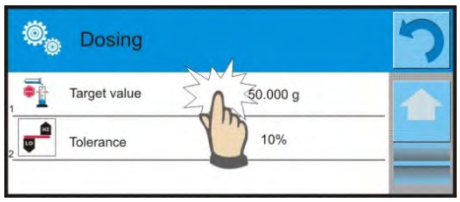


- Bar graph is displayed, its colour corresponds to the current status of mass:
  - yellow: mass value lower than 'target value - tolerance value',
  - green: mass value within permissible tolerance range: 'target value +/- tolerance'
  - red: mass value greater than 'target value + tolerance value'.



Procedure 2 – entering checkweighing thresholds manually:

- Press <button (Target value).
- Window for entering target value and tolerance is displayed, enter the values.
- Return to weighing.



Caution: *For a product acquired from Products Database the Target Value and Tolerance data are already given. The data can be edited and modified.*

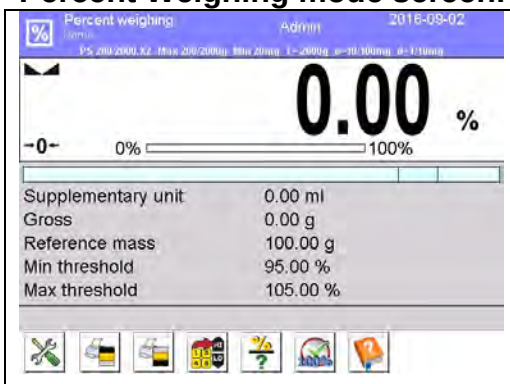
18.2. Mode Related Settings

To find out more about the remaining functions refer to section 15.7 of this user manual, *Additional Parameters for a Weighing Process*.

19. PERCENT WEIGHING AGAINST REFERENCE SAMPLE MASS

<**Percent weighing**> is a working mode for comparison of the measured sample's weight with the reference mass. The result is expressed in [%].
PERCENT WEIGHING function can be aided by DOSING and CHECKWEIGHING functions. Mind that these are not started automatically, neither is bar graph.

Percent Weighing mode screen:

	1. Setup – press to access balance menu. 2. Print header – press to print data declared in the header. 3. Print footer – press to print data declared in the footer. 4. Products Database – press to select products from products database. 5. Percent weighing: press to set reference mass. 6. Percent weighing: press to set as 100%.

19.1. Sample Mass and Reference Sample Mass Comparison

– Comparison methods: Entering reference mass, to do it press button (Set reference mass).

– Accepting mass of load resting on the weighing pan as a reference mass, to do it press <Set 100%> button.
– selecting product, out of products database, for which 'mass' parameter has been defined; to do it press <Products> database.

Procedure 1 – entering reference mass manually

- Press button (Set reference mass).
- Enter the reference mass value and press button to confirm.
- Weighed products mass is compared to the reference mass, the weight difference is displayed in [%].

Procedure 2 – accepting mass of load resting on the weighing pan as a reference mass

- Load the weighing pan with the sample.
- Upon indication stabilization press <Set 100%> button.
- 100.000% indication is displayed, weight of the product resting on the weighing pan is accepted as reference mass, it is automatically recorded and displayed in reference mass field.
- Unload the weighing pan.
- From now on the weighed products mass is compared to the reference mass, the weight difference is displayed in [%].

Procedure 3 – selecting product from Products Database:

- Press <Products> database. Select product to be weighed.
- Info field automatically displays modified information concerning reference mass.
- Product-related reference mass is automatically recorded and displayed in reference mass field. Press button to open reference mass field.
- 0.00 % indication is displayed (for unloaded pan).
- From now on the weighed products mass is compared to the reference mass, the weight difference is displayed in [%].

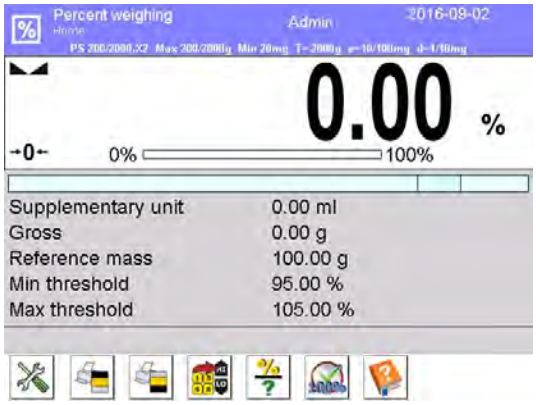
19.2. Checkweighing and Dosing in Percent Weighing Mode

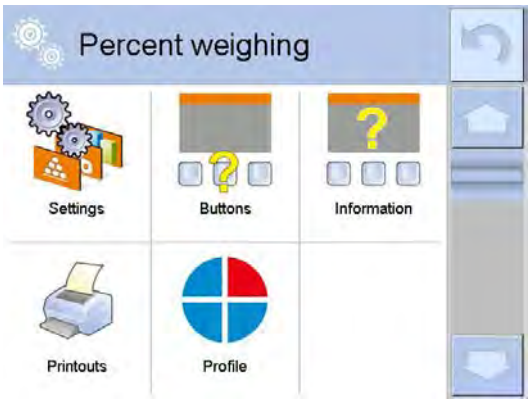
PERCENT WEIGHING function can be aided by DOSING and CHECKWEIGHING functions. In order to make them accessible assign them to an on-screen button.

Remember to provide percent values for both of the functions.

Procedure:

1. Press grey workspace area.
2. The following submenus are displayed: Settings, Buttons, Information, Printouts, Profile.
3. Select <Buttons> menu.
4. List of on-screen buttons, function buttons and proximity sensors is displayed.
5. Press selected element and assign a key to it.





CHECKWEIGHING
Checkweighing function facilitates control of sample mass, mind that Min and Max thresholds, given in [%], are required.

Procedure:

1. Press button (Checkweighing thresholds).
2. Press Min threshold button and enter its value [%].
3. Press button to confirm.
4. Press Max threshold button and enter its value [%].
5. Press button to confirm.

Caution: *Max threshold value has to be greater than Min threshold value.*

DOSING
Dosing function requires target value to be specified (it must be given in [%]) along with dosing tolerance, i.e. permissible +/- surplus or shortfall.

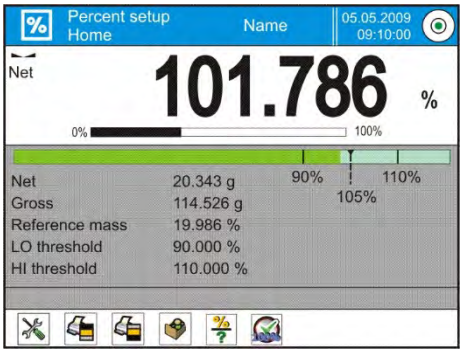
Procedure:

1. Press < button (Target value).
2. Enter the target value in [%].
3. Set tolerance value, if required.
4. Press button to confirm.
5. Press Min threshold button and enter its value [%].
6. Press button to confirm.

19.3. Bar Graph

The DOSING and CHECKWEIGHING functions are aided by a graphic indication, i.e. bar graph. Example of simultaneous operation of DOSING and CHECKWEIGHING functions is presented below.

- <>Checkweighing thresholds settings: Min= 90%, Max = 110%.
- target value = 105%; tolerance = 5% <>,
- reference mass = 19.986 g <>.



19.4. Mode Related Settings

To find out more about the remaining functions refer to section 15.7 of this user manual, *Additional Parameters for a Weighing Process*.

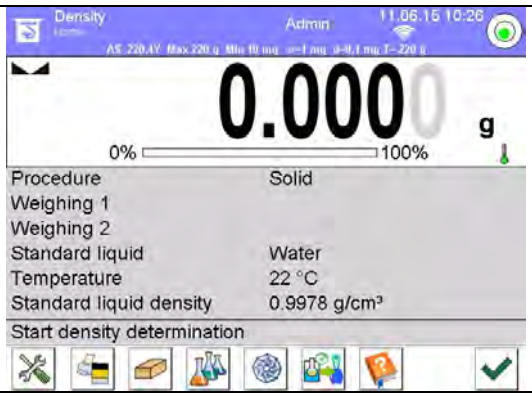
20. DENSITY

Density> is a working mode enabling to determine density of:

- solid bodies,
- liquids,
- air (available for XA 4Y),
- various substances with use of pycnometer.

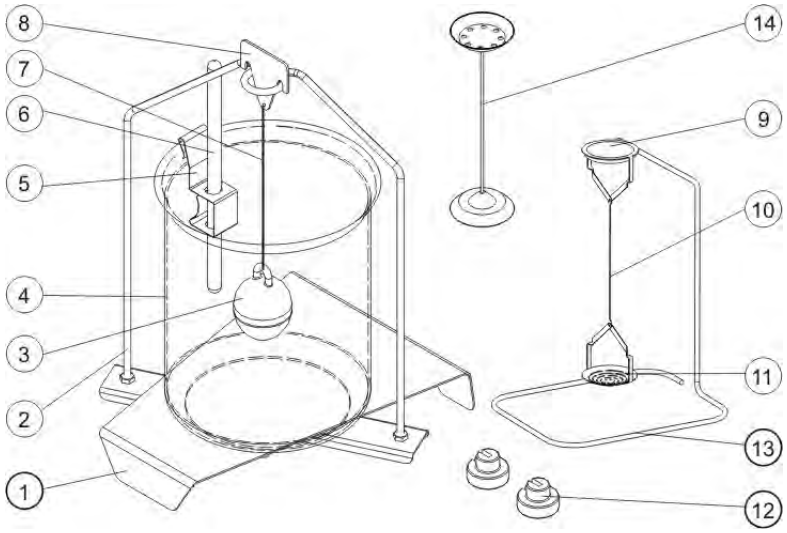
In order to operate this mode, a density determination kit (supplementary equipment) is required.

Density mode screen:

	1. Setup – press to access balance menu. 2. Print header – press to print data declared in the header. 3. Print footer – press to print data declared in the footer. 4. Solid density 5. Liquid density 6. Air density **7.** Pycnometer

20.1. Density Determination Kit

Kit intended for XA balances:

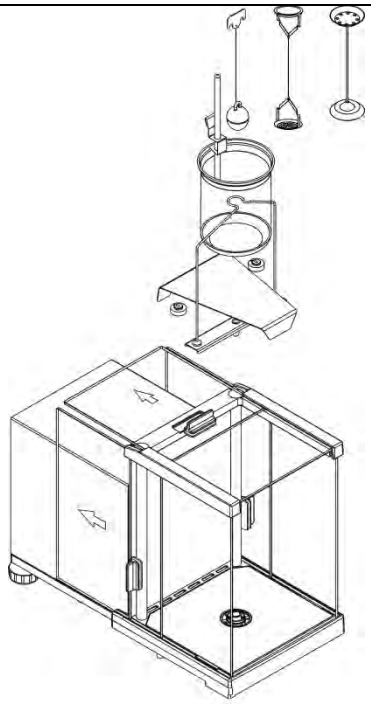


1	Beaker base
2	Stand
3	Sinker
4	Beaker
5	Thermometer holder
6	Thermometer
7	Flexible connector for sinker
8	Hanger
9	Top weighing pan for solids density determination
10	Flexible connector for weighing pans
11	Bottom weighing pan for solids density determination
12	Additional sinker
13	Additional stand for a set of pans or a sinker
14	Additional set of weighing pans for density determination of solids with density lower that density of water

CAUTION:

- *Components of density determination kit shall be stored in a box.*
- Weighing pans and sinker must not be put directly on a table, this might cause their damage. *Weighing pans and sinker, if not in use, must be put on an additional stand.*

20.2. Assembly

XA balances	
	***CAUTION:*** *If the kit has been installed and -NULL- message is displayed then load the balance with weights set (12) and zero and tare the indication. Thus prepared balance can be used for density determination.*

20.3. Solids Density Determination

Prior the procedure start, it is necessary to set process-related parameters:

- Liquid type:
  - Distilled water
  - Ethanol
  - Other liquid with determined density
- Liquid temperature
  (required if either distilled water or ethanol is used as liquid for measurement performance)
- Liquid density
  The parameter is set automatically, after the temperature has been entered, if either distilled water or ethanol is used as liquid. In case of using liquid other than distilled water or ethanol, it is necessary to enter its density manually.

The density of solids is calculated using the following formula:

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

ρ - density of a sample
A - sample mass measured in the air
B - sample mass measured in liquid
ρ_o - liquid density

Procedure:

1. Install density determination kit.
2. In order to record density value for a particular product in products database, go to <Settings> menu, set <Assign density to product> parameter and press <Product> quick access button to make the product active.
3. Press < Density of solids> button.
4. Respective menu is displayed, using it set the following parameters: Standard liquid, Temperature, Standard liquid density.
5. Press < START> button.
6. Process of density determination begins.
7. Load the TOP density kit pan with a sample, wait for a stable measurement result and press < > button.
8. Load the BOTTOM density kit pan (immersed in liquid) with a sample, wait for a stable measurement result and press < > button.
9. Density result is displayed.
10. Press < > button to complete the procedure.

CAUTION:

Press < > button to start new density determination process with the same settings.

20.4. Liquids Density Determination

In order to determine density of liquid first determine sinker's density in the air, next in the liquid. The density of liquid is calculated according to the following formula:

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

ρ - liquid density
A - sinker mass measured in the air
B - sinker mass measured in water
V - sinker volume
d - air density (max 0.001 g/cm^3)

Install the density determination kit, and enter sinker's volume to balance's memory.

- Press <Liquid density> button.
- A respective menu is displayed, using it press <Sinker's volume> button and enter sinker's volume value, take it from the sinker's hanger.
- Process of liquid density determination begins.

Procedure:

1. Install density determination kit.
2. In order to record density value for a particular product in products database, go to <Settings> menu, set <Assign density to product> parameter and press <Product> quick access button to make the product active.
3. Press <START> button.
4. Follow the displayed commands.
5. Carry out measurement in the air, wait for a stable measurement result and press <> button.
6. Carry out measurement in the tested liquid, wait for a stable measurement result and press <> button.
7. Density result is displayed.
8. Press <> button to complete the procedure.

CAUTION:

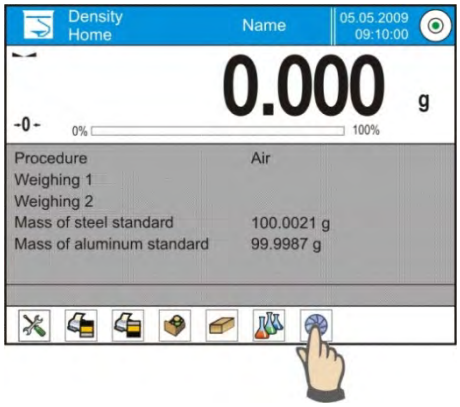
Press <> button to start new density determination process with the same settings.

20.5. Air Density

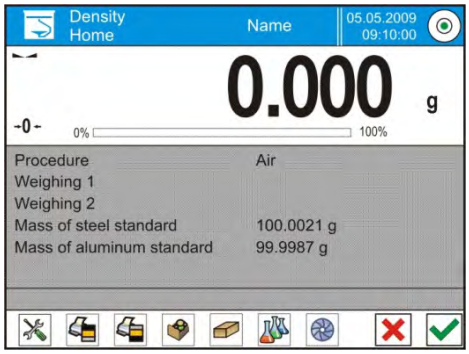
<> Air density value is one of numerous data required for calculation of measurement result correction, which correction is an effect of air BUOYANCY compensation. Another value required for the calculation is weighed sample density. The function of air density determination is enabled only in balances with reading unit lower than d=1mg. Determining density of air requires use of a dedicated set of mass standards (additional equipment), specific for a given balance model.

Procedure:

1. Press <Air density> button.
2. Menu of Air Density function is displayed.



3. Press field for entering weight value of steel mass standard, enter the value as provided in calibration certificate.
4. Press field for entering weight value of aluminium mass standard, enter the value as provided in its calibration certificate.
5. Press field for entering density value of steel mass standard, enter the value.
6. Press field for entering density value of aluminium mass standard, enter the density value.
7. Press START field, air density determination begins.



8. Load the pan with steel mass standard, wait for a stable measurement result and press <> button.
9. Load the pan with aluminium mass standard, wait for a stable measurement result and press <> button.
10. Density result is displayed.
11. Press <> button to complete the procedure.

The value of determined air density is automatically assigned to <Air density> parameter in <Settings/ Air buoyancy compensation> menu for weighing working mode.

20.6. Determining Density Using Pycnometer

Prior the procedure start, it is necessary to set process-related parameters:

- Pycnometer weight (if pycnometer weight is known, the measurement is carried out once when the pycnometer is filled with substance).
- Pycnometer volume.

The density of solids is calculated using the following formula:

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

ρ - density of a sample
A - sample mass measured in the air
B - sample mass measured in liquid
ρ_o - liquid density

Procedure 1 – when the pycnometer weight has been entered

1. In order to record density value for a particular product in products database, go to <Settings> menu, set <Assign density to product> parameter and press <Product> quick access button to make the product active.
2. Press <Pycnometer> button.
3. Respective menu is displayed, using it set the following parameters: pycnometer weight, pycnometer volume.
4. Press <START> button.
5. Process of density determination begins.
6. Fill in the pycnometer with tested substance, follow the pycnometer guidelines.
7. Load the pan with a pycnometer, wait for a stable measurement result and press <> button.
8. Density result is displayed.
9. Press <> button to complete the procedure.

CAUTION:

Press <> button to start new density determination process with the same settings.

Procedure 2 – when pycnometer weight has not been entered

1. In order to record density value for a particular product in products database, go to <Settings> menu, set <Assign density to product> parameter and press <Product> quick access button to make the product active.
2. Press <Pycnometer> button.
3. Respective menu is displayed, using it set the following parameters: Pycnometer volume.
4. Press <START> button.
5. Process of density determination begins.

6. Load the pan with a pycnometer, wait for a stable measurement result and press <✓> button.
7. Take the pycnometer off the pan, fill it with tested substance, follow the pycnometer guidelines.
8. Load the pan with a pycnometer, wait for a stable measurement result and press <✓> button.
9. Density result is displayed.
10. Press <✓> button to complete the procedure.

CAUTION:

Press <✓> button to start new density determination process with the same settings.

20.7. Mode Related Settings

The supplementary settings enable you to adjust the working mode to your needs and requirements.

- **Request sample number:**
  NO - sample number not required; single measurement.
  YES - sample number required; series of measurements.
- Measuring unit: [g/cm^3], [kg/m^3], [g/l]; selected unit is valid for all density determining options and for final indication printouts.
- Assign density to a product: YES/NO; the software automatically assigns the value of determined density of solid or liquid to <Density> parameter in a product record of the database of products. To use this function first enter products database and select a product for which the density procedure is carried out. Next start density determining process (if density has already been determined for this product, it is replaced with new value).
- Tare mode
- Printout/Enter mode
- Printout

To find out more about the remaining functions refer to section *15.7* of this user manual, *Additional Parameters for a Weighing Process*.

20.8. Printouts

Printouts option enables you to determine particular standard printout content and to define a non-standard printout.

- **Standard printout**
  Standard printout comprises four internal sections containing different variables.
  Variable settings: YES - print, NO – not print.

Settings for header, weighing and footer printouts are to be found in section 14.5. For density printout template read below.
You can design content of a report for each of carried out procedures. Upon pressing <Density printout template> parameter, a window is opened where you can set content of a particular report.

Particular reports content:

SOLID	***LIQUID***	***AIR***	***PYCNOMETER***
– Working mode – Procedure – Sample no. – Operator – Balance type – Balance S/N – Date – Time – Standard liquid – Temperature – Density of standard liquid – Weighing 1 – Weighing 2 – Density – Volume – Product – Warehouse – Customer – Empty line – Dashes – Signature – Non-standard printout	– Working mode – Procedure – Sample no. – Operator – Balance type – Balance S/N – Date – Time – Sinker volume – Temperature – Weighing 1 – Weighing 2 – Density – Product – Warehouse – Customer – Empty line – Dashes – Signature Non-standard printout	– Working mode – Procedure – Sample no. – Operator – Balance type – Balance S/N – Date – Time – Mass of steel standard – Mass of aluminium standard – Density of steel standard – Density of aluminium standard – Weighing 1 – Weighing 2 – Density – Product – Warehouse – Customer – Empty line – Dashes – Signature – Non-standard printout	–Working mode –Procedure –Sample no. –Operator –Balance type –Balance S/N –Date –Time –Pycnometer mass –Pycnometer volume –Weighing 1 –Weighing 2 –Density –Product –Warehouse –Customer –Empty line –Dashes –Signature Non-standard printout

20.9. Performed Density Determinations Report

Upon completed density determination processes (solid body, liquid, air) a report is generated. The report is saved to **<** **Density reports>** database. The files are named by the date and time (hour) of mass comparison process.
An example of solid density determination report:

---------- Density ----------
---------- Solid body ----------

Operator Admin	
Balance S/N	*400015*
Date	*2011.10.07*
Time	*10:08:09*
Standard liquid	*Water*
Temperature	*22 °C*
Density of standard liquid	*0.9978 g/cm^3*
Weighing 1	*10.526 g*
Weighing 2	*2.586 g*
Density	*1.322776 g/cm^3*

Signature

Using header and footer information

Procedure:

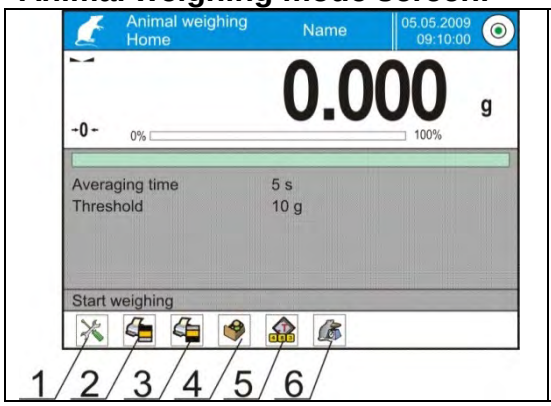
- Press <Print header> button.
- Carry out density determination procedure.
  - Report is printed out automatically after the second measurement confirmation.
  - When density determination result is displayed, the report can be printed repeatedly by pressing <**PRINT**> button.
- Press <Print footer> button upon completion of density determination procedure.

CAUTION:
Remember to select data to be printed in the header, footer and report. For detailed information go to section 14.5, Printouts.

21. ANIMAL WEIGHING

<Animal weighing> is a working mode allowing reliable determination of mass of weighed objects in motion. In principle, this type of objects generate unstable measurement, thus it requires using a different filtering method of measurement signal.

Animal weighing mode screen:

	1. Setup – press to access balance menu. 2. Print header – press to print data declared in the header. 3. Print footer – press to print data declared in the footer. 4. Products Database – press to select products from products database. 5. Set tare. 6. Animal weighing.

21.1. Animal Weighing Settings

Animal Weighing mode parameters must be set with regard to selected mass analysis method.

Procedure:

1. Press <Animal weighing> button.
2. List of Animal Weighing parameters is displayed:

- Averaging time

Time interval within which measurements are analysed. Obtained data is used for calculation of measurement result.

- Automatic operation

Parameter determining whether the measurement is to be carried out manually (on pressing a key), or automatically. The measurement starts automatically if indication on balance's display exceeds the value of a set threshold. Measurement of the next object begins after removing one object from the weighing pan (the indication is below threshold value) and

loading the pane with the next object at the moment when the indication exceeds the set threshold value.

- Threshold

Value expressed in mass units. In order to trigger the measurement, the indicated value has to be greater than the threshold value.

3. Set parameters and return to weighing.
4. Load the weighing pan with an object to be weighed, press <> button.
5. “Freezed” measurement result is displayed.
6. In order to proceed to the next measurement press <> button:

   - in case of manual operation mode, press <> button.
   - in case of automatic operation mode, unload the weighing pan and load it with the new object to be weighed.

21.2. Mode Related Settings

To find out more about the remaining functions refer to section *15.7* of this user manual *Additional Parameters for a Weighing Process*.

22. FORMULATIONS

<Formulations> is a working mode allowing you to prepare multi-ingredient mixture. The whole process is carried out automatically.
While making mixtures you can:

- **use formulations database** which stores formulations; the program helps you dispense particular amount of formulation ingredients, this is done by means of respective on-screen messages.
- make mixture on your own, without using formulations database, with this option you control dispensed ingredients, their sequence and quantity by yourself.

If you want to use formulations database, first you have to create recipe (make formulation), next apply it. In order to create formulation, enter <Formulations> database. For detailed procedure informing you how to create formulation, read later sections of this user manual.

Formulations mode screen:

1. Setup – press to access balance menu.
2. Print header.
3. Print footer.
4. Formulation – press to select formulation from the database.
5. Formulation multiplier (formulation activated when <NO> value is set for <Multiplier’s editing> parameter).
6. Target mass
7. Formulation using out of database ingredients

22.1. Mode Related Settings

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

Procedure:

1. Press grey workspace area.
2. The following submenus are displayed: Settings, Buttons, Information, Printouts, Profile.
3. Select <Settings> menu.
4. Functions related to formulations are displayed.

Functions:

- **Automatic ingredients naming**:
  - YES
  - NO
- **Apply tare from database**:
  - YES - each ingredient has a tare value assigned (the value is assigned on the basis of data for a particular product saved to the products database);
  - NO - tare is not applied
- **Means of ingredient verification**:

  Use this function to specify how to determine ingredient mass during formulation making process,
  by **TOLERANCE or by THRESHOLDS**.
  TOLERANCE: the software accepts mass of an ingredient as correct if it is within set percent tolerance of total ingredient's mass (±%) - (data acquired from database of products).
  THRESHOLDS: the software accepts mass of an ingredient as correct if it is within set thresholds (data acquired from database of products).
  Specified method is in effect for all ingredients in the formula making process.
  If during formulation making process one of the ingredients is weighed in excess (its mass is out of high tolerance limit) the following message is displayed upon ingredient weight confirmation: <VALUE OUT OF RANGE. RECALCULATE THE FORMULATION?>. Confirm, the software automatically recalculates mass of other ingredients so that the mixture proportions are correct.
  In order to make THRESHOLDS option active, the product/ingredient related data in database must correspond with value selected for <MEANS OF INGREDIENT VERIFICATION> parameter, e.g. ingredient thresholds are specified and <THRESHOLDS> value is selected for <MEANS OF INGREDIENT VERIFICATION> parameter, otherwise particular ingredients mass recalculation is not possible, i.e. ingredient thresholds are specified and <TOLERANCE> parameter is selected for <MEANS OF INGREDIENT VERIFICATION> parameter.
- **Multiplier's editing**:

  Function designed to enable making multiple mixtures according to a selected formulation in a single weighing process:
  - **YES** - on selecting a formulation for processing the software requests for multiplier's value, the provided value is in effect for all ingredients in the formulation making process, i.e. each ingredient is multiplied by the value.
  - **NO** - multiplier value is disabled, default value is set to <1>.
- **Printout**:

  for information on how to operate this function read section *15.7* .

22.2. Formulations – Quick Access Buttons

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

22.3. Adding Formulation to Formulations Database

Formulation database contains formulations names, ingredients names and their weight. Each product used for formulation making process is saved to the database of products. When preparing a formulation, first name it, next add ingredients. The software is intuitive and you are guided by means of respective messages. Make sure you know complete recipe as it is necessary to specify name and weight of each mixture ingredient. Formulations database menu has been designed to enable adding formulations.

Procedure:

- Enter <Databases> submenu and press < Formulations> button.
- Press <Add> button to add a new formulation.

A new record is automatically added to the database, it is opened in an editing mode. Enter necessary data.
List of parameters defined for a formulation:

1. Name: click name button, new window opens, enter formulation name.
2. Code: click code button, enter code number.
3. Ingredients: click ingredients button, list of formulation ingredients is displayed (for new formulation the list is empty), add the ingredients:
   - Press <Add> button.
   - Select one of available options:

   <New ingredient> - select to add a new product, first enter name, next specify mass to be weighed during formulation making process. The software automatically adds the products to the products database.
   CAUTION:
   In order to enter remaining product data it is necessary to go to product database.
   <New ingredient from database> - select to view a list of database-stored products, choose the product you need for your mixture, the software weighs as much product/ingredient as specified by product database mass parameter.
   Mass value can be edited and modified for each added product. The introduced modifications do not affect mass value saved to the database.
4. Ingredients quantity: parameter disabled for editing updated by the software upon adding an ingredient to a formulation.
5. Sum: target mass of a formulation, i.e. sum of all formulation ingredients, parameter disabled for editing, updated by the software upon adding an ingredient to a formulation.

22.4. Using Formulations in Weighing

Upon running FORMULATIONS mode, you can prepare the mixture either manually or by selecting formulation from the database.
Mixture preparation options:

- formulation not recorded in the Formulation Database – manual preparation,
- formulation recorded in the Formulation Database,
- formulation recorded in the Formulation Database – using multiplier function,
- formulation recorded in the Formulation Database – determining target mass of complete formulation.

CAUTION:
In order to use the above options it is necessary to add respective quick access buttons to the bottom bar and set formulations mode parameters.

Select a formulation, weigh each of its ingredients. Wait for the indication to stabilize and press < > button. Weight of each ingredient is tared upon pressing < > button; i.e. it is accepted for the total mass of the formulation.

Press button to cancel all operations regarding formulation making process. Now you can prepare a different formulation.

Procedure 1 – formulation not recorded in the Formulation Database – manual preparation. Follow the displayed prompts.

- Go to quick access bar and press button (Start).
- Name the formulation.
- Select ingredients for a formulation.
- Select the first ingredient (new or from database of products).
- The home screen is displayed.
- Put the container used for carrying out the measurement on a weighing pan and tare it when the indication is stable.
- Dispense specified amount of ingredient.
- Press < > button to confirm.
- Select the next ingredient.
- Repeat the steps for remaining mixture ingredients.
- With all the ingredients weighed, select one of the following options:
  - <Save and finish> - select to save the process to formulations database, the process is finished automatically, the final report is recorded in formulation database.
  - <Finish> - select to complete without saving the process to formulations database the process is finished automatically, the final report is recorded in formulation database.
- Upon completion, formulation home screen is displayed, message <Completed> is visible in the bottom bar. To proceed press < > button.
  Caution:
  It is possible to abort formulation making process at any moment. To abort the process press > button.

Procedure 2 – formulation recorded in the Formulation Database.
Basic recipe making process. Procedure 2 allows you to prepare mixtures with multiplied amount of ingredients.
Follow the displayed prompts.

- Press < > button (Formulation).
- List of Formulations is displayed, select the formulation that is to be carried out.
- Press < > button (Formulation with multiplier).
  If in Formulation mode settings <Multiplier's editing> option is disabled (set to <NO> value) the software automatically skips to formulation making process. If the <Multiplier's editing> option is enabled (set to <YES>) the software displays a window with a keyboard for inserting the multiplier value. Mass of all formulation ingredients is

multiplied by the specified value (mass of each ingredient is a product of mass saved to a formulation and multiplier value).

- Confirm entered multiplier value, the software proceeds to formulation making process. The following parameters are displayed: selected formulation name, the first ingredient name, ingredient number, mass to be weighed and target mass.
- Put the container used for carrying out the measurement on a weighing pan and tare it when the indication is stable.
- Dispense specified amount of the ingredient.
- Confirm ingredient mass value, the software automatically adds the mass to the sum of weighed formulation ingredients, the next ingredient weighing begins.
- With all formulation ingredients weighed a report on completed process is printed and saved to reports database (report template is editable, to edit a report template go to <Printouts> parameter), message <Completed> is visible in the bottom bar. To proceed press <> button.

Procedure 3 – formulation recorded in the Formulation Database – using multiplier function.
This procedure is useful when you need to prepare a mixture with pre-determined mass, that is different from the mass resulting from summing of used ingredients.
In such case, there is no need for you to carry out complex calculations of ingredients' mass. The software adjusts mass of each ingredient in relation to pre-defined target mass of the complete formulation.
Follow the displayed prompts.

- Press <> button (Formulation).
- List of Formulations is displayed, select the formulation that is to be carried out.
- Press <Masa ?> button (Formulation with target mass).
- Window with an on-screen keyboard for entering target mass of a mixture is displayed.
- Confirm entered multiplier value, formulation making process starts automatically. The following parameters are displayed: selected formulation name, the first ingredient name, ingredient number, mass to be weighed and target mass.
  Mass of each ingredient is automatically recalculated (proportionally) to the value of defined target mass of the complete formulation.
- Put the container used for carrying out the measurement on a weighing pan and tare it when the indication is stable.
- Dispense specified amount of ingredient.
- Confirm ingredient mass value, the software automatically adds the mass to the sum of weighed formulation ingredients, the next ingredient weighing begins.
- With all formulation ingredients weighed a report on completed process is printed and saved to reports database (report template is editable, to edit a report template go to <Printouts> parameter), message <Completed> is visible in the bottom bar. To proceed press <> button.

In order to print report on completed formulation making processes enter Formulation Reports Database.

22.5. Printouts

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

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

Settings for header, weighing, and footer printouts are specified in section 14.5. For settings of formulation report read below. You can design report content.

Caution:
In order to specify which measurement data is to be printed on a report it is necessary to modify settings for <Weighing printout template> parameter. To enable particular measurement data printout, set it to <YES> value for it. Upon each completed formulation process the program generates a report. The report is recorded in < ***Formulation reports****> database. Report files are named by date and time of formulation process performance.*

Particular reports content:	*Example of a report*
– Working mode – Operator – Customer – Warehouse – Formulation – Formulation code – Start date – End date – Ingredients quantity – Measurements quantity – Measurements – Target value – Sum – Formulation difference – Status – Empty line – Dashes – Signature – Non-standard printout	*---------- Formulation Report ----------* *Operator Nowak Jan* *Formulation name Mixture 1* *Start date 2011.12.16 13:21:40* *End date 2011.12.16 13:22:28* *Ingredients quantity 5* *Completed measurements quantity 5* *---------- Measurement 1 ----------* *19.994 g* *---------- Measurement 2 ----------* *49.993 g* *---------- Measurement 3 ----------* *9.999 g* *---------- Measurement 4 ----------* *1.001 g* *---------- Measurement 5 ----------* *19.995 g* *Total mass 100.982* *Target mass 101.000* *Difference -0.018* *Status OK* *----------* *Signature* *.....*

23. STATISTICS

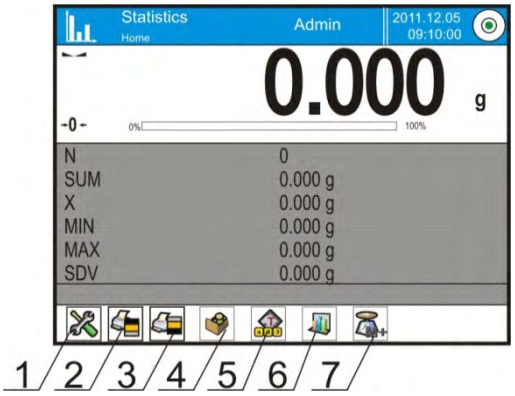
< Statistics> is a working mode that enables acquiring data from series of measurements and to produce statistics using the acquired data. Settings of this function determine which data is displayed.

Procedure for activation of Statistics mode:

In home screen, press pictogram located in the top bar. <Working modes> submenu is opened, it contains list of working modes to be selected. Select < Statistics>, the home screen is displayed automatically, wherein the top bar of the screen features pictogram.

Statistics mode screen:

1. Setup – press to access balance menu.
2. Print header – press to print data declared in the header.
3. Print footer – press to print data declared in the footer.
4. Products Database – press to select products from products database.
5. Set tare.
6. Statistics
7. Add to statistics.



23.1. Buttons and Information Settings

Buttons crucial for series of measurement:

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

Each working mode features automatically displayed set of default keys and information displayed in Info field.

23.2. Additional Settings for Statistics

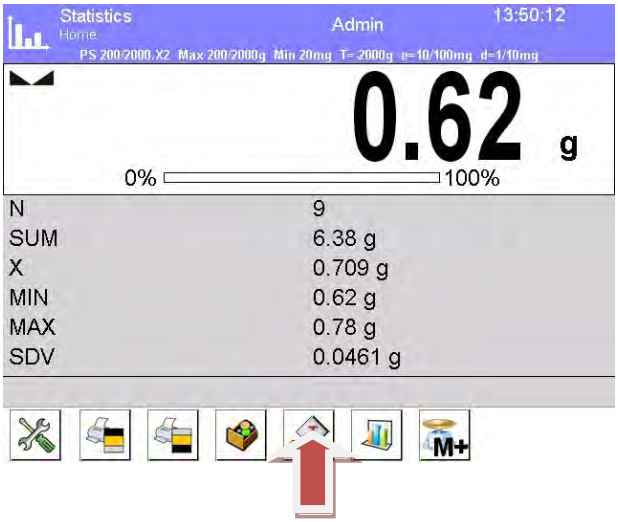
To find out more about the remaining functions refer to section *15.7* of this user manual Additional Parameters for a Weighing Process.

23.3. Measurement Series Parameters

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

Procedure:

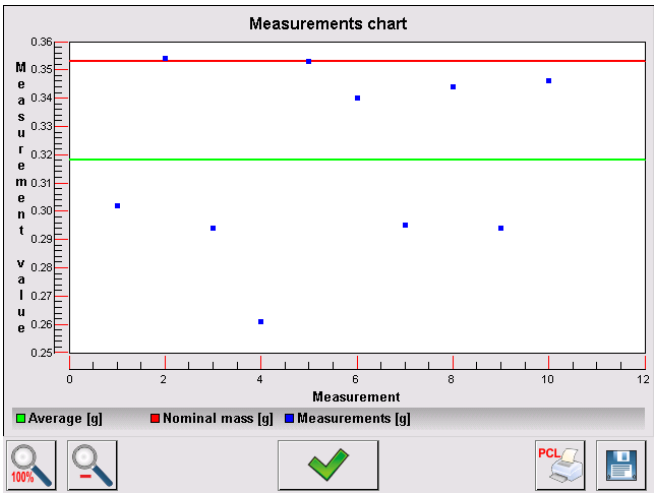
1. Press < button (Statistics).



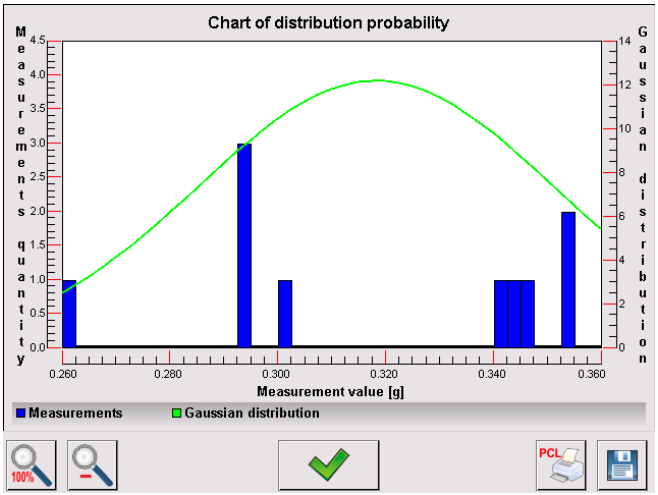
2. The following options are displayed: Result, Print, Delete last, Delete, Measurements Chart, Distribution Probability Chart.
3. Select one of available options:
   - **Result** – to preview statistics report,
   - **Print** – to print a report,

Report example:
---------- Statistics----------
N 9
SUM 455.600 g
X 50.6222 g
MIN 49.939 g
MAX 51.380 g
D 1.441 g
SDV 0.39605 g
RDV 0.78 %

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



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

– 

Bottom bar tools:

	Press to display complete graph.
	Press to zoom out the screen content.
	Press to go back to the previous window.
	Press to print the graph using PCL printer.
	Press to save the graph as *.*bmp* file to USB flash drive connected to USB port.

24. PIPETTES CALIBRATION

Balance enables pipettes calibration using dedicated program function or *PIPETTES* PC software (workstation for pipettes calibration). Prior to calibration start install pipettes calibration set inside the anti-draft chamber. This equipment is an additional accessory. Assembly procedure is presented below.

Pipettes calibration can be carried out.

Pipettes calibration> is a working mode allowing you to determine errors of measurement of piston pipettes volume. The errors can be determined either with reference to ISO 8655 standard or your own requirements.
In case of calibration carried out with reference to ISO 8655 standard the errors are automatically selected for particular volume, as specified in the standard (refer to: table of errors, ISO 8655 standard).
Pipette calibration mode enables:

- calibrating pipettes of fixed-volume or variable-volume, and single or multi- channel pipettes.

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

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

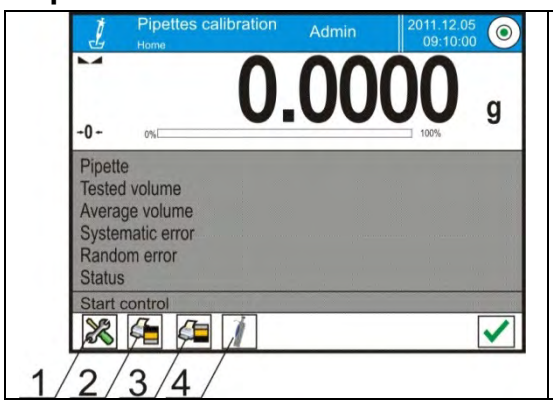
Use only distilled water for pipettes calibration.

Ambient conditions crucial for high accuracy calibration:

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

While calibrating pipettes **use pipettes database** providing you with pipette related data, parameters, tested volume, and error values determined for specific volumes.
Prior pipette calibration process. enter pipettes database and provide pipette-related fata and calibration criteria. In order to add pipette it is necessary to enter the database. For information on how to add pipette to pipettes database read down this user manual.

Pipettes Calibration mode screen:

	1. Setup – press to access balance menu. 2. Print header. 3. Print footer. 4. Select pipette.

24.1. Mode Related Settings

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

Procedure:

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

Functions:

- **Measurements quantity**: designed to enable determining measurements quantity for tested pipette volume (valid for each tested volume in case of a pipette with adjustable volume),
- **Request serial number**: YES/NO. YES – a window with an on-screen keyboard is displayed, use it to enter serial number of a pipette.
- **Operation with adherence to ISO 8655**: YES/NO. YES – the software automatically takes error values accordant to ISO 8655 standard (if other error values have been defined for a particular pipette, then on selecting <Operation with adherence to ISO 8655> parameter the specified error values are neglected and replaced by those from ISO standard).
- **Upload ambient conditions parameters from THB module**: YES/NO. YES – the software automatically acquires and saves ambient conditions' parameters from a connected THB sensor at a right time. NO – you have to read ambient conditions (i.e. temperature, humidity and pressure) from external sensors and enter them manually both before and after calibration.
- **Result control, Tare mode, Automatic footer printout, Printout mode, Printout**: for information on how to operate these functions read section *15.7* .

24.2. Pipettes Calibration – Quick Access Buttons

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

24.3. Adding a Pipette to Pipettes Database

Database of pipettes contains list of pipettes' names and other data including tested volumes and error values for a specific volume. When adding a pipette to the database, first specify its name, and then add remaining.
The software is intuitive and you are guided by means of respective messages. Pipettes database menu has been designed to enable adding formulations.

Procedure:

- Enter <Databases> submenu and press < Pipettes > button.
- Press Add> button to add a new pipette.

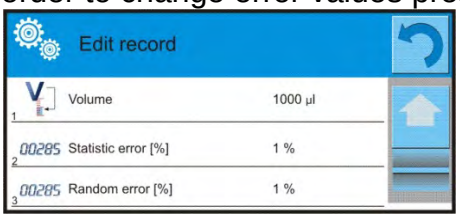
A new record is automatically added to the database, it is opened in an editing mode. Enter respective data.
List of parameters defined for a pipette:

1. Name: press to enter pipette name.
2. Code: press to enter pipette code.
3. Model: press to enter model name.
4. Tip: press to enter tip name
5. Volume type: ADJUSTABLE/FIXED.
6. Nominal volume: pipette's nominal volume value.
7. Minimum volume: pipette's minimum volume value, for fixed volume pipette enter <0>;
8. Channels quantity: specify number of pipette's channels, for a single channel pipette enter <1>;

9. Type: NONE/A/D1/D2. Pipette type adheres to standard guidelines. In case of calibration carried out with reference to ISO 8655 standard the errors are automatically selected for particular volume. Determining pipette type is crucial.
10. Tested volumes: press “Tested volumes” field, a window with a list of calibrated volumes opens (in case of a new pipette the list is empty), add volume to be tested, and define error value for each tested volume.

Procedure:

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



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

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

- Upon setting correct values return to the home screen.

24.4. Printouts

Printouts option enables you to determine content ofa particular standard printout and to define non-standard printout.

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

Settings for header, weighing, and footer printouts are specified in section 14.5. For settings of pipettes calibration report read below.

Printout content:

– Working mode – Operator – Customer – Pipette – Serial no. – Channels quantity – Channel no. – Measurements quantity – Cooperation in accordance with ISO 8655 – Start date – End date – Dashes	– Signature – Non-standard printout – Water temperature – Temperature – Humidity – Pressure – Z coefficient – Measurements and statistics – Statistics – Status – Empty line

24.5. Pipettes Calibration Start-Up

In order to carry out pipettes calibration process you need a special adapter, the adapter does not come standard with the balance. The adapter facilitates piston pipettes calibration and/or verification, it is intended for 3Y and 4Y balances.
The adapter has been designed to minimize evaporation occurring in the course of liquids weighing. It comprises a mini weighing chamber installed inside the weighing chamber of a balance, an evaporation ring and a dedicated weighing pan enabling to locate a measuring vessel in the very centre.
Application of the adapter prevents risk of liquid evaporation during the calibration process. Compact dimensions of the adapter along with use of the evaporation ring enable maintaining high humidity rate inside the weighing chamber.
Carried out research has proved that the adapter eliminates or considerably reduces liquid evaporation process. Eliminated/reduced liquid evaporation is a key factor while calibrating piston pipettes by means of a gravimetric method.
Selecting an appropriate adapter and balance is conditioned by calibrated pipettes type.
Prior to pipettes calibration start install the adapter inside of the weighing chamber, next enter data regarding pipettes that are to be calibrated, include complete pipette characteristics and values of errors (see: Pipettes Database).
Now set pipettes calibration parameters:

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

CAUTION:
For parameters and settings overview refer to section 24.1 of this user manual.

Upon setting the above parameters, you can start pipettes calibration.

Pipettes calibration procedure:

1. Press < Select pipette> button.
2. List of pipettes is displayed, select pipette to be calibrated.
3. Pipettes calibration home screen is displayed, selected pipette name is visible in INFO field.
4. Press < START> button.
5. With <YES> value set for <Request serial number> parameter a window for entering the number opens.
6. Window for entering ambient conditions values is displayed, read the temperature, humidity and pressure from external sensors and enter them, next press < Accept> button.
   With <YES> value set for <Upload ambient conditions parameters from THB module> parameter, the temperature, humidity and pressure values are acquired automatically from the THB module, water temperature must be entered manually, enter it and press < Accept> button to confirm.
7. Pipettes calibration home screen is displayed, tested volume and process status <In progress> are displayed in INFO field. The task bar displays prompts guiding you through the process - < C1/V1/N1 Sample weighing >.
   Where: C1 – channel number; V1 – volume number for the channel; N1 – measurement number for tested volume.

8. Keep following the prompts until the calibration process is completed. INFO field provides you with information on the on-going process (average volume, error values).
9. Upon confirmation of the last measurement a window with ambient conditions parameters is displayed again. Enter the parameters and press < Accept> button to confirm.
10. A report is generated automatically, the report is printed and recorded in pipettes calibration reports database (ambient conditions and water temperature values given on a report are average values from the process);
11. Press < > button located in the bottom bar. For multichannel pipette you are asked whether the process shall be continued for remaining channels. Upon confirmation the balance carries out calibration process for the following channels. The settings remain unchanged.
12. You can start the following procedure for the same pipette or select another pipette form pipettes database.

24.6. Performed Pipettes Calibrations Report

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

Report example:

---------- Pipettes Calibration ----------
Operator Kowalski
Customer Nowak
Pipette p901\1k
Serial no. 7777
Channels quantity 1
Channel no. 1
Measurements quantity 10
Operation with adherence to ISO 8655 Yes
Start date 2012.03.15 07:50:44
End date 2012.03.15 07:54:34
Water temperature 22.15 °C
Temperature 21 °C
Humidity 48 %
Pressure 1005 hPa
Z coefficient 1.00328

------- Tested volume: 1000 µl -------
1 0.998 g 1000.82389 µl
2 0.998 g 1000.82389 µl
3 0.998 g 1000.82389 µl
4 0.998 g 1000.82389 µl
5 0.998 g 1000.82389 µl
.
.
Average volume 1000.82389 µl
Average [%] 100.08 %
Systematic error 0.82389 µl
Systematic error[%] 0.08239 %
Permissible error ± 16 µl
Random error 0 µl
Random error [%] 0 %
Permissible error ± 6 µl
Status Positive

Signature .....

25. DIFFERENTIAL WEIGHING

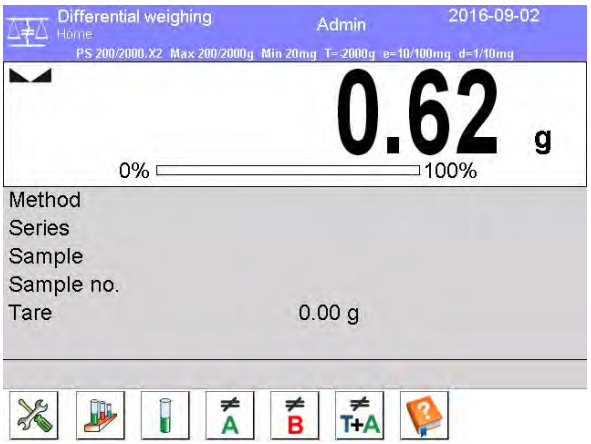
< Differential weighing> is a working mode enabling you to analyse changes of mass of a single sample or multiple samples. The process is carried out by determining sample's initial mass, next the sample is subjected to different processes, as a result some sample's ingredients are either separated or added. Finally, the sample is repeatedly weighed (differential weighing). After the final weighing, the balance determines the difference between those two mass values (initial and final).
Differential weighing mode allows you to:

- Determine **a series**, each series may contain several samples.
- Assign a name for each series, print or export data on a series to a connected USB flash drive;
- For each sample: determine tare value, initial mass and carry out up to five measurements for the final mass.

In order to operate differential weighing mode, first it is necessary to enter weighing series to the database, define samples in the series, next trigger the series. To create series go to series database. For detailed procedure informing you how to create series, read later sections of this user manual.

Differential Weighing mode screen

1. Setup – press to access balance menu.
2. Series
3. Sample
4. Weighing A
5. Weighing B
6. Weighing T+A
7. Delete value



25.1. Mode Related Settings

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

Procedure:

1. Press grey workspace area.
2. The following submenus are displayed: Settings, Buttons, Information, Printouts, Series, Profile.
3. Select <Settings> menu.
4. Functions related to differential weighing are displayed.

Functions:

- **Threshold**: mass value (maximum mass of a sample, e.g. filter)
- **Ambient conditions**: use this function to force operator to enter temperature and humidity prior to weighing operation: <Weighing A, Weighing T+A, Taring T>
  - NO - value not required
  - ONLINE – values taken form ambient conditions module cooperating with the balance.

- VALUE – values taken from device other than ambient conditions module must be entered manually.

– **Maximum quantity of weighings**: use this function to declare how many times final weighing <B> is to be repeated – 5 times maximum, the parameter setting is valid for all measuring series.

– For information on how to operate remaining functions read section 15.7 *Additional Parameters for a Weighing Process*.

25.2. Differential Weighing - Quick Access Buttons

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

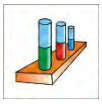
This section presents only those buttons that are characteristic for *Differential Weighing* mode.

Weighing A
Press to start weighing initial mass <A>. The process is carried out as a separate operation.

Weighing (T+A)
Press to start sample container taring which is next followed automatically by sample weighing (non-separable operations). Upon initiation you are asked to set sample's name.

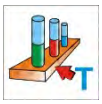
Tare (T)
Press to start sample container taring. The process is carried out as a separate operation. Upon initiation you are asked to set sample's name.

Weighing B
Press to start weighing final mass <B>. The button triggers differential weighing mode



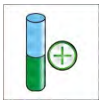
Series
Press to select a sample for which the differential weighing process is to be carried out.

Sample
Press to select a sample for currently carried out process of a particular series.



Copy Tare
Press to copy tare value, determined for a given sample, to all current series samples (for which the tare value has not been assigned yet).

Deleting Value
Press to delete the most recently recorded mass value (tare, weighing A or weighing B).



Add sample
Press to add a new sample, window with an on-screen keyboard is displayed, use it to provide the new sample name. In order to add a new sample first it is necessary to select series for which the sample is to be added. Mind not to start weighing operation before selecting the series and adding the sample.

25.3. Adding Series to Series Database

Series Database comprises series and series samples.
While creating a series, first set its name, next add samples. The software is intuitive and you are guided by means of respective messages. Provide a name for each sample. To add a series go either to series database or differential weighing mode.

Procedure:

- Enter <Database> submenu and press <Series> button.
- Press <Add> button, a series is added.

A new record is automatically added to the database, it is opened in an editing mode. Enter the necessary parameters.
List of parameters defined for series:

1. Name: press “Name” field, a window for entering series name opens.
2. Code: enter series code.
3. Customer: select a customer for whom the series measurements are to be carried out.
4. Samples: press to view list of samples, for a new series the list is empty, add new samples.
   - to do it press <Add> button, the sample is added automatically, its name can be edited and changed.
5. Samples quantity– parameter disabled for editing, the number is updated at real time by the software on adding a new sample to the series.

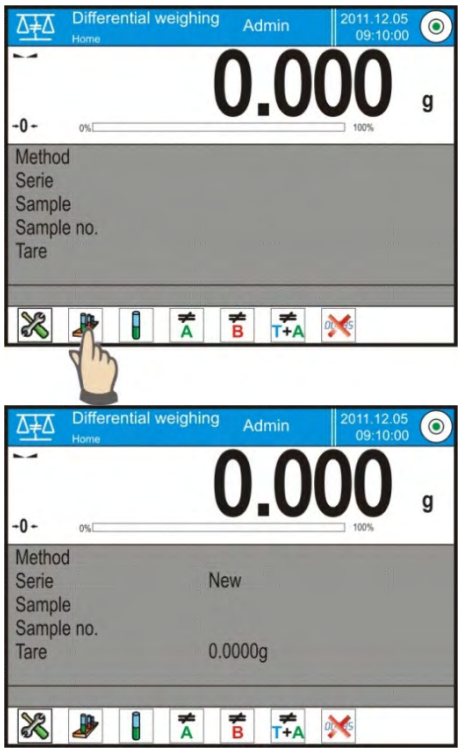
For each sample on the list its current differential weighing status is displayed (weighing process stage).
Newly added samples do not have any status assigned – the field is empty. The status is updated at real time after each completed weighing process stage.

25.4. Differential Weighing Process Example

Activate DIFFERENTIAL WEIGHING mode, next:

- select information to be displayed in the grey workspace
- select appropriate quick access buttons
- add a series to balance’s memory (series is identified by name)
- add samples to a series (sample is identified by name
- return to the differential weighing home screen

SELECTING a series:
Press <SERIES> quick access button, a window with series database opens.
Enter the database, press field with series that is to be carried out.
Selected series name is displayed in the grey workspace (provided that such information is enabled to be displayed).



Upon selecting a series, press one of the following buttons determining how the differential weighing is to be carried out:

Weighing A
Press to start weighing initial mass.

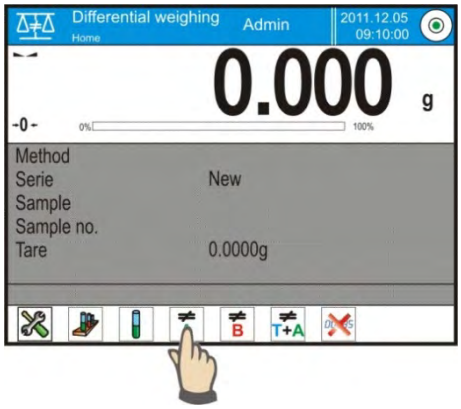
Tare (T)
Press to start sample container taring.

Weighing (T+A)
Press to start sample container taring which is next followed automatically by sample weighing (non-separable operations).

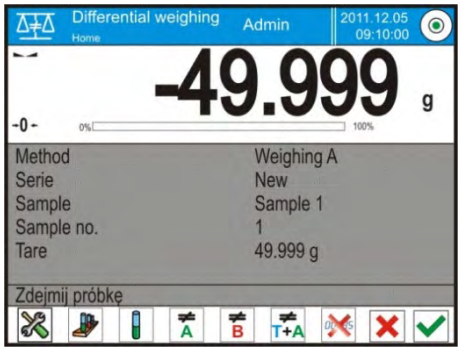
Weighing B
Press to start weighing final mass. The button is enabled only for a series containing samples for which weighing A has been carried out. If there are no such samples, the operation is disabled.

Weighing A

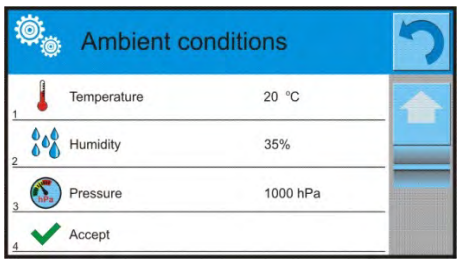
Upon pressing Weighing A button, the balance searches samples list in order to find the first sample for which weighing <A> is still to be carried out. If there are no such samples the balance displays a message informing you that the operation is disabled.
If the operation is enabled then new data on initiated process is displayed in the grey workspace.
You are guided through the process by means of prompts visible either in the workspace or bottom bar.



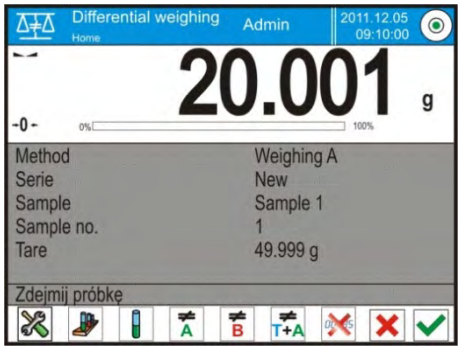
Load the weighing pan with a sample and press < ✓ > button.
<Ambient condition> parameter set to <Value> parameter a window for entering temperature and humidity values is displayed. For <Ambient condition> parameter set to <ONLINE> parameter a window for confirmation of values taken from ambient conditions module is displayed.



CAUTION:
If <Ambient conditions> parameter for the differential weighing mode is set to <No> value the software skips this part of the process.



Press < > button to confirm ambient conditions values, differential weighing home screen is displayed, you are prompted to unload the weighing pan.



Unload the weighing pan and press < > button.
The balance searches samples list again in order to find the first sample for which weighing <A> is still to be carried out. Follow the above procedure and carry out weighing of the remaining samples.

In order to abort the process press < > button.

Weighing T

Upon pressing Weighing T button, the balance searches samples list in order to find the first sample for which weighing <T> is still to be carried out. If there are no such samples the balance displays a message informing you that the operation is disabled. If the operation is enabled then new data on initiated process is displayed in the grey workspace.
You are guided through the process by means of prompts visible either in the workspace or bottom bar.

Load the weighing pan with a sample container and press < > button.

Upon pressing < > button you are prompted to unload the weighing pan.

Unload the weighing pan and press < > button. The balance searches samples list again in order to find the next sample for which weighing <T> is still to be carried out. Follow the above procedure and weigh the remaining containers.

In order to abort the process press < > button.

Weighing T+A

Upon pressing Weighing T button, the balance searches samples list in order to find the first sample for which weighing <T> is still to be carried out. If there are no such samples the balance displays a message informing you that the operation is disabled. If the operation is enabled then new data on initiated process is displayed in the grey workspace.
You are guided through the process by means of prompts visible either in the workspace or bottom bar.

Load the weighing pan with a sample container and press < > button.
Container mass value is assigned to a sample as tare value, balance indication is zeroed, and you are prompted to place the sample in the container. Follow the prompt and press < > button.
For <Ambient condition> parameter set to <VALUE> parameter a window for entering

temperature and humidity values is displayed. For <Ambient condition> parameter set to <ONLINE> parameter a window for confirmation of values taken from ambient conditions module is displayed.

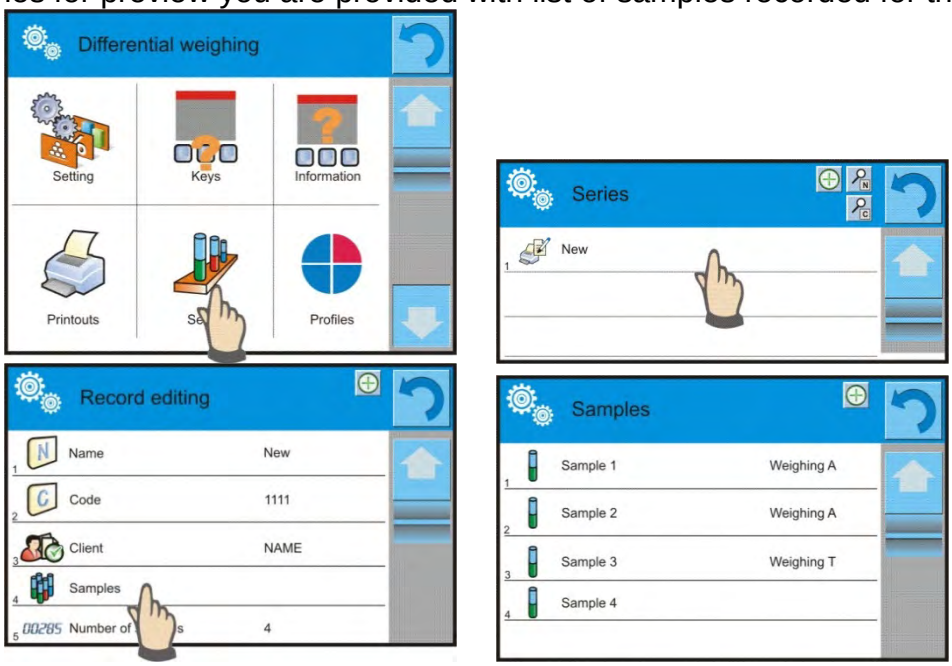
CAUTION:
If <Ambient conditions> parameter for the differential weighing mode is set to <No> value, the software skips this part of the process.

Press < > button to confirm ambient conditions values, differential weighing home screen is displayed, you are prompted to unload the weighing pan.

Unload the weighing pan and press < > button. The balance searches samples list again in order to find the first sample for which weighing <A> is still to be carried out. Follow the above procedure and carry out weighing of the remaining samples.

In order to abort the process press < > button.

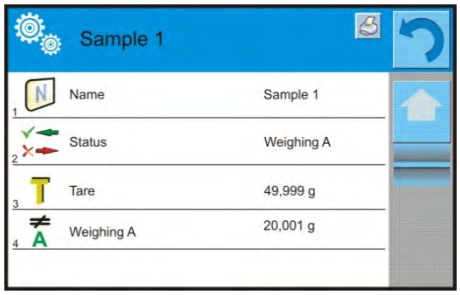
Measurement of series samples can be carried under the following procedures: weighing A, weighing T or weighing T+A. Each of the series samples features status informing you on a process stage for a given sample. Upon entering the series database and selecting a particular series for preview you are provided with list of samples recorded for the series.



Status overview:

- weighing A, measurements completed for <Weighing A> or <Weighing T+A> procedure,
- weighing T, measurements completed for <Weighing T> procedure.

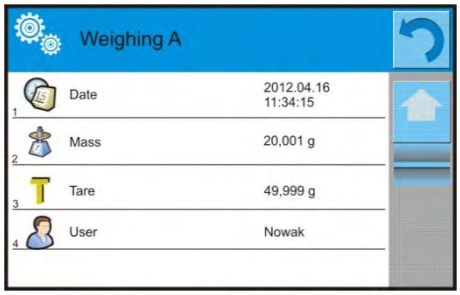
In order to preview detailed information on a sample, press field with its name. Sample window contains the following data:



For sample measured under:

- weighing A procedure only – tare value is <0>,
- weighing T procedure only – weighing A value is <0>,
- weighing T+A procedure – tare and weighing A values is mass.

You can print weighed sample data, to do it press a printer pictogram located in the top bar. In order to preview data on weighing A, press <Weighing A> field:



If a given series already contains samples for which weighing A (initial mass) has been carried out you can proceed to carrying out weighing B (final mass).

Weighing B

Select:

Upon pressing Weighing B button, the balance searches samples list in order to find the first sample for which weighing <B> is still to be carried out. If there are no such samples the balance displays a message informing you that the operation is disabled. If the operation is enabled then new data on initiated process is displayed in the grey workspace.

CAUTION:
Next to <Weighing B> caption you can see digits 1/3 where <1> means the first measuring cycle of type B, and <3> means that <REPETITIONS QUANTITY> parameter is set to <3> value (3 cycles).
The software prompts you to carry out the <FIRST> cycle, out of <3> cycles, for all samples in the series for which the measurement is enabled (it is required that weighing A is already completed for the sample).

You are guided through the process by means of prompts visible either in the workspace or bottom bar.

If tare is assigned to a sample, then its value is displayed with '-' sign. Load the weighing pan with a sample (if tare is assigned load the sample in a container) and press <✓>.
For <Ambient conditions> parameter set to <Value> option, a window for entering temperature and humidity values is displayed. For <Ambient condition> parameter set to <ONLINE> option a window for confirmation of values taken from ambient conditions module is displayed.

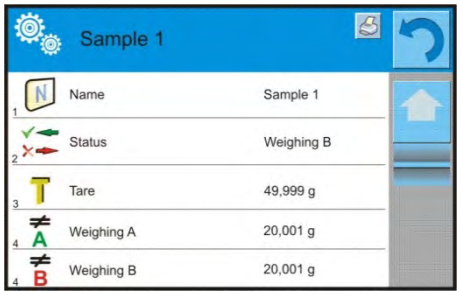
CAUTION:
If <Ambient conditions> parameter for the differential weighing mode is set to <No> value the software skips this part of the process.

Press <✓> button to confirm ambient conditions values, differential weighing home screen is displayed, you are prompted to unload the weighing pan.

Unload the weighing pan and press <✓> button. The balance searches samples list again in order to find the first sample for which weighing <B> is still to be carried out. Follow the above procedure and carry out weighing of the remaining samples.

In order to abort the process press <✗> button.

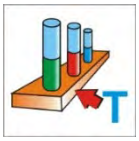
Upon completing measurements of final mass for the samples in a series, you can check the results in the series database. To check the results, enter the database, select a series, then select samples and a specific sample for which <Weighing B> has been carried out.



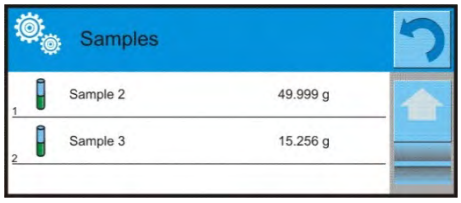
Particular weighing preview mode provides you with values. Numbers referring to weighing <B> inform on the measuring cycle.
Data on a specific series can be printed or exported to a file.

25.5. Copy Tare

Copy Tare option enables copying once selected tare value (in a series) to all samples which do not have tare value assigned, and for which differential weighing process has not been completed (status other than Weighing B).
Procedure:

Press  button.

List of samples with tare values assigned is displayed.
Press tare value that is to be applied to other samples which do not have tare assigned yet.
The selected tare value is assigned automatically.



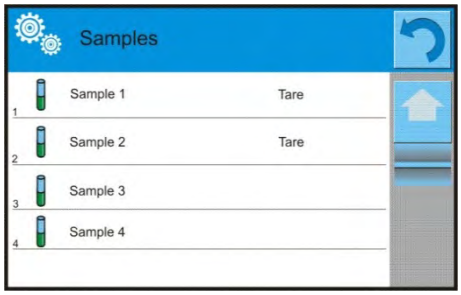
25.6. Sample Selection

Sample Selection option enables selecting a sample for weighing, with use of this option you do not have to weigh samples in an order suggested by the software. The option is available only after initiating a given process.

Procedure:

Go to differential weighing mode, select a series, press procedure button, e.g. <Weighing A> procedure.

List of samples for which the selected procedure can be carried out is displayed.
Select a sample that is to be weighed.
This option is particularly useful if a series contains a large number of samples, and you want to weigh a sample that is at the end of a series.



25.7. Deleting Values

Delete option enables deleting last weighing record added to the database. It refers to all processes in the working mode. The software enables deleting only the most recent measurement operation.

If you have saved a weighing record by mistake (sample or tare), i.e. wrong sample or container has been used, press button

The weighing record is automatically deleted, the software returns to the previous step of the procedure. The process can be carried out once only, otherwise respective message informing on error is displayed, deleting a record is aborted.

25.8. Printouts

Printouts option enables you to determine content of particular standard printouts and to define non-standard printout.

Standard Printout

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

Settings for header, weighing, and footer printouts are specified in section 14.5. For settings of series and sample printout template read below.
Report content.

Series printout content:	Samples printout content:
– Dashes – Customer – Samples – Empty line – Dashes – Signature – Non-standard printout	– Dashes – Sample – Sample no. – Status – Tare – Temperature – Humidity – Pressure – Non-standard printout – Weighing A • Weighing A • Date • Time • Level status • Warehouse • Product • Packaging • Universal variable 1 … 5 • Net • Tare • Non-standard printout – Weighing B • Weighing B • Date • Time • Level status • Warehouse • Product • Packaging • Universal variable 1 … 5 • Net • Tare • Interval • Difference • Difference % • Residue % • Non-standard printout

26. STATISTICAL QUALITY CONTROL- SQC

<**Statistical Quality Control**> is a working mode designed to support control of product packing process. It enables detecting surplus or shortfall of product in a packaging.
If the weighing results are stored in the database, then trend analysis can be carried out and displayed in a form of a graph.
The software provides the possibility of controlling a batch comprising up to 1000 samples. Each completed control process is saved to the SQC database, and its results are ready for previewing at any time. Each series has a determined set of parameters that are stored in the database: maximum, minimum, standard deviation and average value for each batch, etc.

SQC control process can be carried out manually (by pressing <PRINT> button for each measurement) or automatically (automatically carried out record of stable measurements).

The balances feature module for statistical control processes. It is supported by a database containing list of products with error values (<T2->; <T1->; <T1+> and <T2+>) declared for each product.
The control process is initiated automatically and completed on controlling a required quantity of samples. As a user you define how many samples are to be controlled, to do it go to SQC settings.
After completed control process a final report can be generated and/or printed. Data on a control is also automatically saved to the Database of SQC Reports.

Control process:

- operator selection,
- product selection,
- control start,
- acquiring weighing records,
- control finish (carried out automatically when predefined number of samples is weighed - batch),
- control report print.

26.1. SQC Mode Start Up

In order to activate SQC mode you need to be assigned with permission level required for carrying out control process.

CAUTION:

1. *Starting a control requires **<Operator>** permissions level at least. If a logged user or an anonymous user' permissions level is **<Guest>** then on control start, message **<Unauthorized access>** is displayed.*
2. *For information on logging procedure read section 8 of this user manual, for information on how to grant permissions read section 12 of this user manual.*

- Set **<SQC>** mode parameters. For detailed information read section 26.2.

- Select a product that is to be controlled (press <> button), mind to select a product with correctly entered control data,
  List of data to be entered prior control start

	Mass	Product nominal mass
	Tare	Packaging mass in adjustment unit
	SQC	
	Thresholds mode	Declaring whether thresholds values are to be entered in [g], or in percent of the product nominal mass.
	Batch quantity	Declaring quantity of controlled batch
	[T4-] error value	Max permissible negative T4 error value with nominal weight value as point of reference
	[T3-] error value	Max permissible negative T3 error value with nominal weight value as point of reference
	[T2-] error value	Max permissible negative T2 error value with nominal weight value as point of reference
	[T1-] error value	Max permissible negative T1 error value with nominal weight value as point of reference
	[T1+] error value	Max permissible positive T1 error value with nominal weight value as point of reference
	[T2+] error value	Max permissible positive T2 error value with nominal weight value as point of reference
	[T3+] error value	Max permissible positive T3 error value with nominal weight value as point of reference
	[T4+] error value	Max permissible positive T4 error value with nominal weight value as point of reference
	Disqualifying quantity of samples [Qn-T4]	Max permissible quantity of T4 low limit errors with nominal weight as point of reference
	Disqualifying quantity of samples [Qn-T3]	Max permissible quantity of T3 low limit errors with nominal weight as point of reference
	Disqualifying quantity of samples [Qn-T2]	Max permissible quantity of T2 low limit errors with nominal weight as point of reference
	Disqualifying quantity of samples [Qn-T1]	Max permissible quantity of T1 low limit errors with nominal weight as point of reference
	Disqualifying quantity of samples [Qn+T1]	Max permissible quantity of T1 high limit errors with nominal weight as point of reference
	Disqualifying quantity of samples [Qn+T2]	Max permissible quantity of T2 high limit errors with nominal weight as point of reference
	Disqualifying quantity of samples [Qn+T3]	Max permissible quantity of T3 high limit errors with nominal weight as point of reference
	Disqualifying quantity of samples [Qn+T4]	Max permissible quantity of T4 high limit errors with nominal weight as point of reference

CAUTION:
For information on how to edit product records read section 30.2 of this user manual.

- Return to **<** **SQC>** mode home screen, press button (control start) located in the bottom bar,
- **<Batch Number>** window with an on-screen keyboard opens (only if <Request batch number> parameter is set to <YES> parameter),
- Enter the number of controlled product batch, press button to confirm.
  CAUTION:

  You can abort the control process at any time, to do it press button (control stop) located in the bottom bar.

  In the course of control other soft keys and function keys, SETUP *and* →T← *keys are locked.*

26.2. Mode Related Settings

The supplementary settings enable you to adjust the working mode to your needs and requirements.

SQC functions:

- **Request batch number**

use this function to force the user to enter batch number of a product prior each control procedure start.

Procedure:

Select <Request batch number> parameter, window with NO/YES values is displayed.
Select <No> – option disabled, or <Yes> – option enabled.
The previous screen is displayed automatically.

- **Batch number**

use this function to enter identification number for controlled products batch.

Procedure:

Select <Batch number> parameter, Batch Number edit box with an alphanumeric keyboard is displayed.

Enter the required batch number and press button to confirm.

- For detailed information regarding remaining functions read section 15.7 *Additional Parameters for a Weighing Process.*

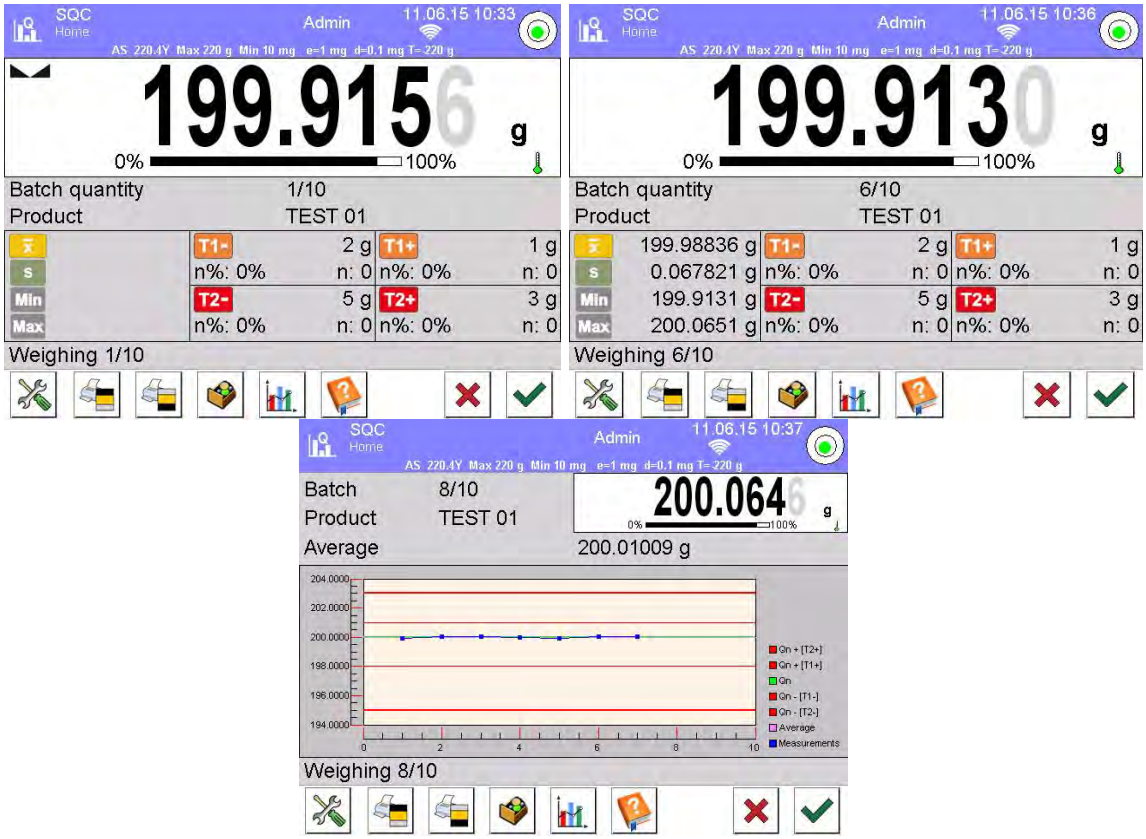
26.3. Control Operation

Procedure:

Press <Product> button to select product to be controlled. Press button located in the bottom bar to initiate the control; an editing box with an on-screen keyboard opens. Enter the batch number and confirm the operation. The software proceeds to the next process steps.

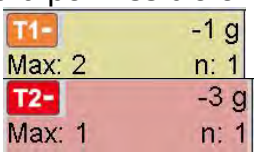
In the course of the control, measurement results are analysed in real time and the following prompts are displayed:

Batch quantity 1 / 10	-	A command on process course and the quantity of all measurements in a tested batch.
Product	-	Controlled product name



Control status

There are different control status options differentiated by colour. Particular colour informs you whether the permissible error quantities are out of range or not. Error values and permissible error quantities are specified for a particular product.



- no more **T1-** error can occur (yellow)

- **T2-** error has occurred, control result is negative (red)

Upon process completion a report is generated and recorded in database.

Caution:

For a template and an example of a report on a control process read section 26.4 of this user manual.

26.4. SQC Control Report

Example of SQC control report:	
----- Report No.: W/16/07/15/07/45 -----	*[T1+] errors quantity 0*
----------	*[T2+] errors quantity 0*
	Min 50.0525 g
Balance type XA 4Y	*Max 50.3638 g*
Range 220 g	*Average 50.291163 g*
Reading unit 0.0001 g	*Sum 1508.7349 g*
Balance S/N 442566	*Standard deviation 0.133916 g*
Start date 16.07.15 07:41:55	*Method SQC*
End date 16.07.15 07:45:25	
Operator Kowalski	*Result Positive*
Product TEST 01	
Batch number	*Measurements*
Nominal mass 50 g	*1. 50.0525 g*
Tare 0 g	*2. 50.0525 g*
[T1-] error value 1 g	*3. 50.0525 g*
[T2-] error value 3 g	*4. 50.0525 g*
[T1+] error value 1.5 g	
[T2+] error value 4 g	*----------*
Batch quantity 100	*Signature*
Measurements quantity 30	
[T1-] errors quantity 0	*.....*
[T2-] errors quantity 0	

Report template

Open <**Printouts/** **SQC report printout template**> section to edit a template of a report. Only variables with <YES> attribute are printed on a report.

27. PEAK HOLD

Peak Hold is a working mode allowing you to snap value of maximum force applied to the weighing pan during one loading.
Apart from standard settings for this mode (described in the *Weighing* mode section), additional parameter has been introduced, it sets threshold value determining function activation.

27.1. Mode Related Settings

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

Procedure:

1. Press grey workspace area.
2. The following submenus are displayed: Settings, Buttons, Information, Printouts, Series, Profile.
3. Select <Settings> menu.
4. Functions related to Peak Hold mode are displayed.

THRESHOLD – value determining start point for peak hold control performed by the balance software. Remember to set this threshold prior to the measuring process.

27.2. Means of Operation

- Enter <PEAK HOLD> mode.
  Once you select the mode, the function is active. Set the threshold (in grams) determining point beyond which the function starts to register maximum force applied.
- From now on the balance registers and holds every single weighing which is above the threshold, and which is higher than the result of the previous peak hold. If the software detects mass above the threshold, the highest detected indication is held on the main display and the pictogram <Max> is displayed on the left.

In order to print the result press button.
The start of the next process of peak hold measurement is possible only after removing the load from the weighing pan and pressing button. This causes returning to the home screen of <Peak Hold> mode. Pictogram <Max> is automatically deleted.

28. PRE-PACKAGED GOODS CONTROL

(mode not available in balance's standard version)

<**Prepacked Goods Controls**> is a working mode enabling performance of pre-packaged goods controls (single stand control or multi-stand control) supported by a database containing products and operators. A control initiated using balance is automatically finished after a pre-set packages quantity (samples) has been controlled. Balances may connect to **E2R SYSTEM** software and form a multi-stand system (network). Each weighing instrument is an independent weighing workstation and information on the control is sent to the computer software. Computer software enables collecting real-time data from each of the connected weighing instruments. The system allows you to start control process using the instrument or computer software.
Collected data allow you to assess quality of produced pre-packaged goods and their conformity with:

- the Regulation by the Central Office of Measures of 3 April 1997, on the requirements concerning quantity inspection of **pre-packaged goods control**, which inspection is to be carried out by means of random selection of the measurements results and sending those results to pre-packaged goods control procedure (FOR EUROPEAN UNION).
- a company quality control system (internal control).

Control process:

- operator selection,
- product selection,
- control start,

- acquiring weighing records,
- control finish (carried out automatically when predefined number of packages is weighed),
- control report print.

Caution: *For detailed information on establishing a connection with<* ***E2R System****> read section 32.1 'COMPUTER'.*

28.1. PGC Mode Start-Up

Procedure:

Go to the home screen, press pictogram located in the top bar. <**Working modes**> submenu is opened. Select **<PGC>** mode, Prepacked Goods Controls home screen is displayed.

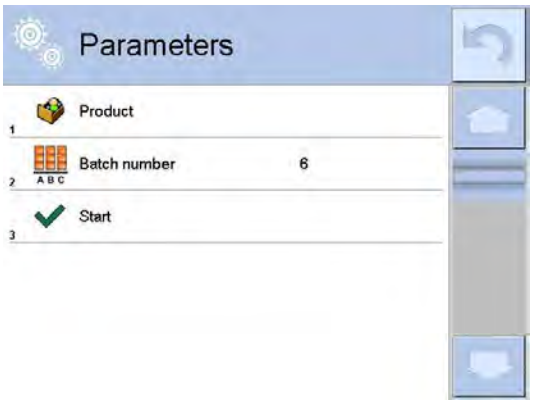
- **<Start control>** message is visible in the bottom bar along with the following button to start the control:

  Control start.

28.2. Control Settings

CAUTION:
Prior to entering control settings window, carry out logging procedure in accordance with section on LOGGING of this user manual.

Press button located in **<PGC>** mode home screen, window with control settings is displayed:



Where:

Press to select product from the database

Batch number

Press to start control process

28.3. PGC Mode Local Settings

Local settings for **<PGC>** mode are available upon pressing grey workspace area in PGC mode home screen.

	Average tare determination	Press to switch on/off option of average tare determination before control start.
	Printout/Enter mode	For detailed description read section: ***ADDITIONAL PARAMETERS FOR A WEIGHING PROCESS***.
	Printout	

28.4. Editing Product for Control Process

In order to edit a product, enter **<SETUP / Database>** submenu.

CAUTION:

*In case of connection with <**E2R System**> software, databases editing on the weighing instrument is disabled. Edition and export of the products to the weighing instrument is carried out using computer software.*

Procedure:

- Enter **<SETUP / Databases**>submenu.
- Enter <**Products**> database and press respective record.

List of parameters defined for control:

Pictogram	Data	Overview
	Name	Product name
	Code	Product code
	EAN code	Product EAN code
	Mass	Product nominal mass
	Tare	Product tare (set automatically upon selecting a product from the database).
	PGC mode	Control type: Non-destructive average tare, Non-destructive empty – full, Destructive full – empty,

		Destructive empty –full
	Batch portion	Measurement series for control: Non-destructive empty – full, Destructive full – empty, Destructive empty – full
	Unit	Unit of a product: [g] or [ml].
	Batch quantity	Declaring quantity of controlled batch
	Interval of average tare determination	Time interval given in [h] determining how often average tare must be estimated for a given product.
	Packaging quantity	Declaring quantity of packages that are to be subjected to process of average tare determination (for Non-destructive average tare type of control)
	Internal control	Submenu for determining internal criteria for a control (see: table below).
	Density	Product density (value range: 0.1g/cm^3 - 5g/cm^3).

Apart from the above listed options there are other ones which may be used for different working modes (e.g. CHECKWEIGHING, THRESHOLDS, etc.)

- **List of parameters defined for internal criteria:**

Internal control	<YES> - enable internal control criteria, <NO> - disable internal control criteria
Sample quantity	Sample quantity for a product
[- T] error value	Max permissible value of **–T** error given in unit set for a product. Measurements lower than **Qn-T** will be considered incorrect
[+ T] error value	Max permissible value of **+T** error given in unit set for a product. Measurements higher than **Qn+T** will be considered incorrect
Disqualifying quantity of samples [Qn – 2T]	Quantity of **-2T** errors disqualifying tested sample
Disqualifying quantity of samples [Qn + 2T]	Quantity of **+2T** errors disqualifying tested sample
Disqualifying quantity of samples [Qn - T]	Quantity of **-T** errors disqualifying tested sample
Disqualifying quantity of samples [Qn + T]	Quantity of **+T** errors disqualifying tested sample
Average limit	Mode for determination of average limit value (constant or automatic)
Average limit [-]	Average limit value (minus) for a tested sample (value of average limit as 'constant')
Average limit [+]	Average limit value (plus) for a tested sample (value of average limit as 'constant')
Coefficient value [-Wk]	Multiplier of standard deviation for value of average limit (minus) calculated automatically

Coefficient value [+Wk]	Multiplier of standard deviation for value of average limit (plus) calculated automatically

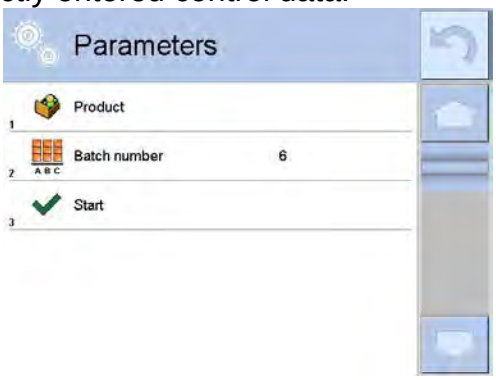
28.5. Control Process Start

Procedure:

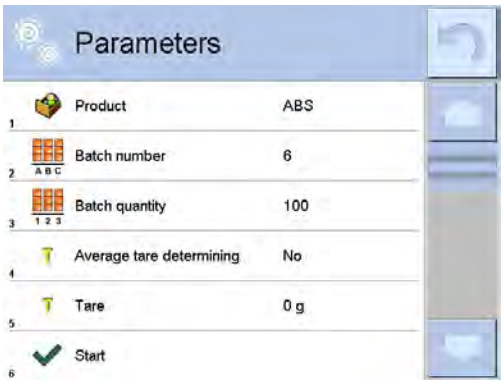
- Log in, make sure that your permissions level allows you to carry out control process.

CAUTION:
For detailed information on procedures of logging and determining operators permissions refer to section concerning logging in operation.

- Select product with correctly entered control data.



- Enter weighing mode parameters.



Batch number – identification of controlled products batch
Bach quantity – software controls specified number of samples
Average tare determining
Packages quantity – more than 10

- Remove load from the weighing pan.
- Press <START > button located in the bottom. The home screen containing entered data is displayed.

Caution: *If prior to control:*

- *Load has not been removed from the weighing pan or if other zeroing requirements have not been met (e.g. unstable indication), balance shows message:* ***<-Err 2>****. Upon noticing <-Err 2> message unload the balance and wait until all zeroing requirements are met.*
- *You have not logged in or you are logged but not assigned with the right permissions to perform control, message:* ***<Unauthorized access>.***

- *You have not selected product from the database, message:* ***<Product is not selected>*** *is displayed.*

28.6. Abort Control Procedure

You can abort control at any moment by pressing button (abort control) located in the bottom part of the process window.

Upon pressing (control stop) button, the following message is displayed:

Press button to return to the ongoing control. Press button to abort control and return to **PGC** mode.

Control report with <**Aborted**> status is saved to PGC database.

28.7. Aborted Control Restoring Procedure, Power Loss Case

In case of disconnection from the mains, to prevent loss of data for control being in progress, the program continuously records control results.

For power loss case the software allows to complete aborted control upon reconnection to the mains.

CAUTION:

Remember to restart the balance when unloaded. It is obligatory to run the balance with an empty weighing pan.

During balance restart the software searches for any in course control procedure. If there is one, the following message is displayed:

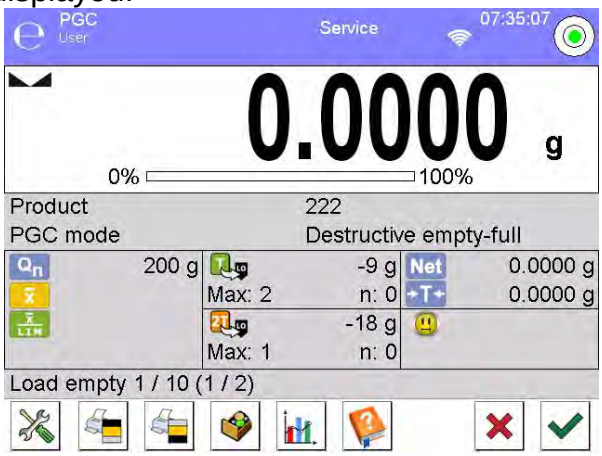
Press button to leave control procedure and proceed to weighing.

Press button to complete aborted control procedure.

28.8. Non-Destructive Average Tare Control Mode

Prior control you can determine average tare by weighing packages. Procedure:
Go to setting window of **PGC** mode.
Activate <**Average Tare Determining**> function by pressing grey field of the main display of <**SETTINGS**> parameters.

The following window is displayed:

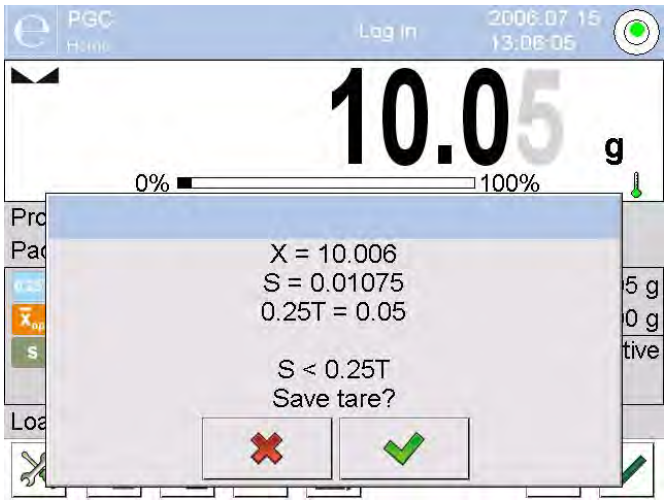


Where:

Product	-	Product name
	-	**0.25T** condition value, given in [g].
	-	Average mass of a packaging, given in [g].
	-	Standard deviation.
	-	Characteristics of sample's negative **T1** errors
	-	Characteristics of sample's negative **2T1** errors
	-	Controlled packaging net weight
	-	Packaging tare
	-	Packaging control status
Load empty	-	Command for process in progress with specified number of all packages to be weighed
	-	Work pane in a form of graph. Graph concerns control of mass only, while estimating average tare value, the preview of packaging mass distribution is not possible.
	-	Information on control
	-	Abort control process

CAUTION:
If a product is to be controlled by “Non-destructive average tare” mode, then *accordingly to Regulation, standard deviation “S” for its packaging mass, based on at least 10 measurements, cannot be greater than 0.25 of maximum permissible negative error T, for nominal packaging mass.*

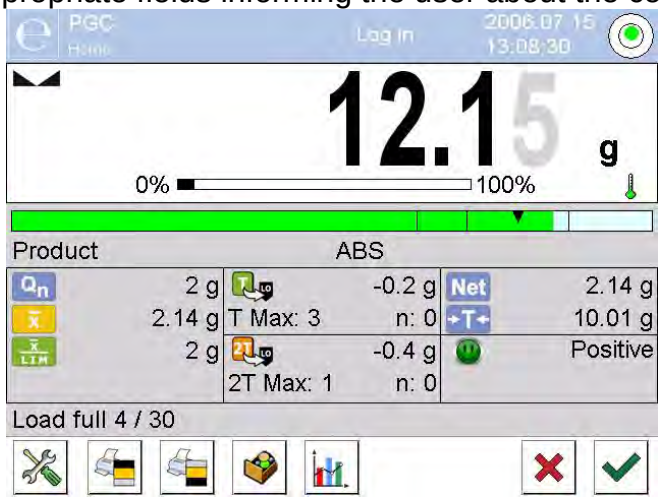
After the last packaging mass measurement has been performed, the following message is displayed:



Press button to proceed to control without saving the newly estimated average packaging mass to product data.

Press button to proceed to control with saving the newly estimated average packaging mass to product data.

During the control process the software continuously analyses measurements results and displays them in the appropriate fields informing the user about the control results:



Where:

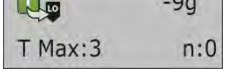
Bar Graph - Information on product net weight in a form of graph:
green bar graph– mass within tolerance range: between [-T] and [+T] of net weight.
yellow bar graph– mass within tolerance range: between [-T] and [-2T] of net weight.
red bar graph– mass below net mass [NET – 2T].

Product - Name of the controlled product

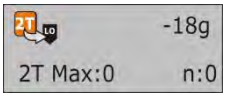
- Nominal value of the controlled product

- Average mass of the controlled product

- Disqualifying average value



- Characteristics of sample's **T** negative errors:
-9g - value of **T** negative error,
T Max - permissible quantity of **T** negative error,
n - actual quantity of **T** negative errors.



- Characteristics of sample's **2T** negative errors:
  -18g - value of **2T** negative error,
  2T Max - permissible quantity of **2T** negative errors,
  n - actual quantity of **2T** negative errors.

- Net weight of the controlled product

- Packaging tare

- Control status: positive, negative.

Load full - Prompt regarding process course.
Command specifying number of all measurements to be done for a given batch.

- Display of numeric data/graph

- Information on control/ results of performed control

- Abort control.

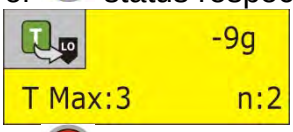
- **Control status**

- positive,

- negative (control of sample 2 permitted)

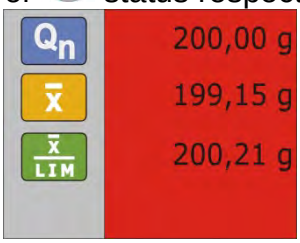
- negative.

For status respective field turns to yellow:



yellow warns that occurrence of another **T** error will end with negative result of control.

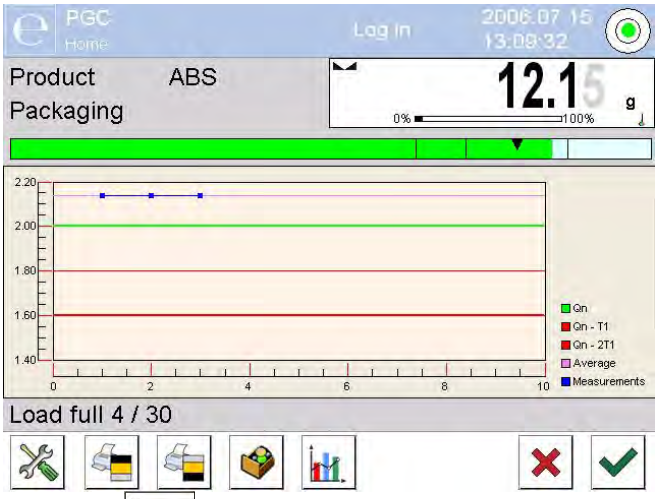
For status respective field turns to red:



- average mass of controlled product is lower than disqualifying average value

- **Workspace**

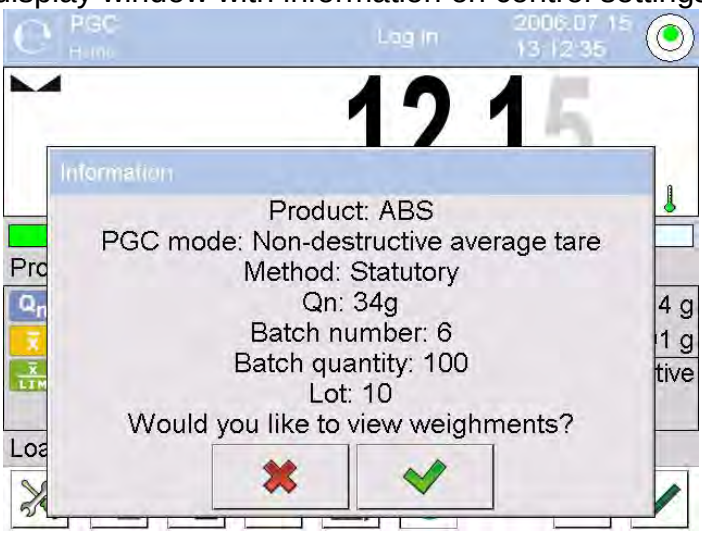
To enable display of the measurements results in a form of graph press button:



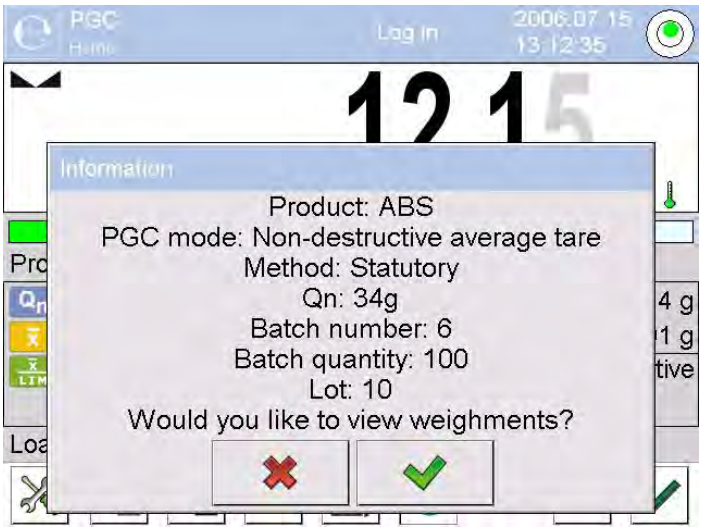
To disable the graph, press button again.

- **Information on the control process**

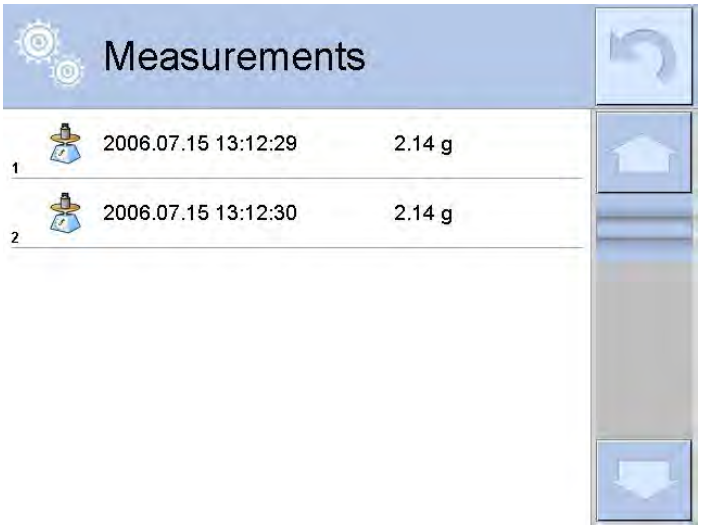
Press button to display window with information on control settings:



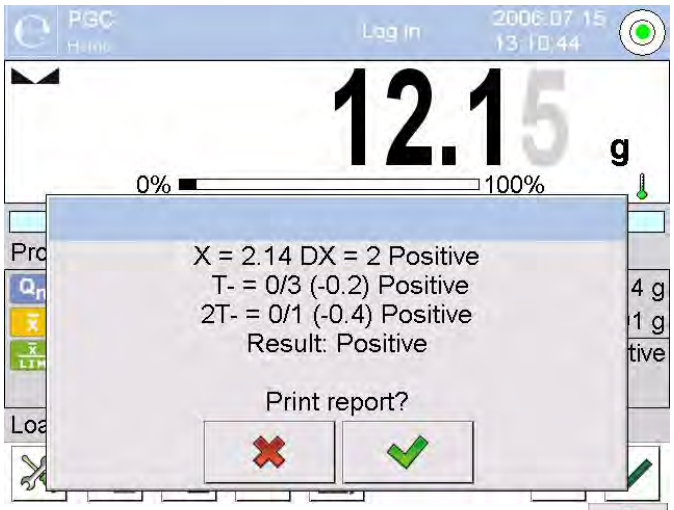
Control in progress window:



Press button to display window with measurements carried out for an ongoing control:



Upon control completion, summary of the process is generated, control is automatically saved to database:



Press button to print report using connected printer. Press button to return to **<PGC>** mode settings without printing the report.

CAUTION:

In case of connection with ***<E2R System>*** *software, control process summary does not contain 'Print report?' question. All data is automatically sent to the computer software, report may be printed using a computer.*

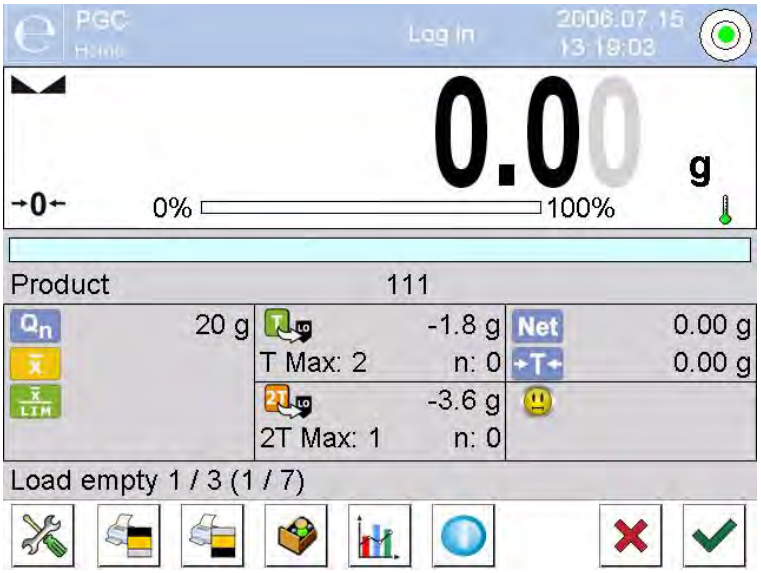
If the quantity of **T** negative errors detected by the software during the control of sample 1 shall require (as specified by the regulation on PGC) sample 2 to be controlled, then, upon sample 1 measurement completion, the following message is displayed:

Press button to confirm. The text and max permissible errors quantity get updated. Upon completed control of sample 2, the software generates control summary. Report on performed control may be printed on a balance-connected printer.

CAUTION:
The template and examples of the average tare determination and PGC reports are to be found further down this user manual.

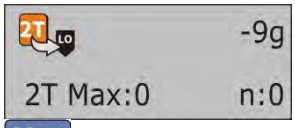
28.9. Non-Destructive Empty-Full Control Mode

When you use **Non-destructive empty-full** mode, set **lot** (batch portion) value, to do it enter product data. A message asking you to weigh empty packages first, full next, in the same order is displayed.



Where:

Product	-	Name of the controlled product
Code	-	Code of the controlled product
Q_n	-	Nominal value of the controlled product
$\bar{x}$	-	Average mass of the controlled product
$\bar{x}_{LIM}$	-	Disqualifying average value
-4,5g T Max:2 n:0	-	Characteristics of sample's **T** negative errors:

	- Characteristics of sample's **2T** negative errors:
	- Net weight of the controlled product
	- Packaging tare
	- Control status
Load empty 1/3	Prompt regarding process course. - Command specifying value of batch portion.
	- Workspace modification: numerical data/graph
	- Abort control.

Upon control completion, a report is generated, control is automatically saved to database.

CAUTION:
The template and an example of control report are to be found further down this user manual.

28.10. Destructive Empty-Full And Full-Empty Control Mode

In case of **Destructive** control, for lot exceeding 100 pcs, sample set by the software for test is always 20 pcs. The other control assessing criteria are set in accordance with the law regulations.
Procedure:
Select product from the list, set parameters for destructive control and determine **batch portion** value.
Start destructive control; prompts helping you to go through control process are displayed (as in case of the controls described above).
Depending on set control mode, the order of products to be weighed is either: **empty-full** or **full-empty**.

CAUTION:
It is necessary to weigh empty packages in the same order as packages filled with product. With this, software correctly calculates mass of a load placed in its corresponding packaging.

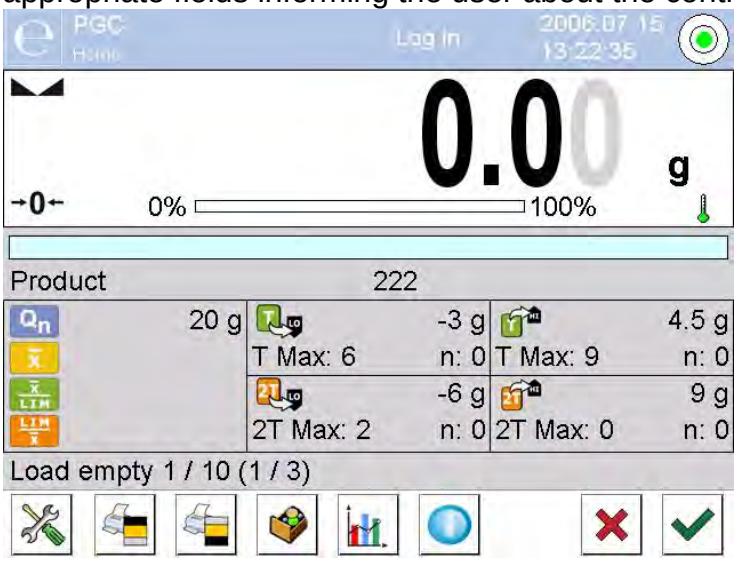
Upon control completion, summary of the process is generated, control is automatically saved to database.

CAUTION:
The template and an example of control report are to be found further down this user manual.

28.11. Control According To Internal Criteria

Select appropriate product with data on control entered correctly in accordance with internal criteria (see: previous sections of this user manual).
Enter PGC mode parameters into balance memory (in accordance with user manual).
Press button to start control.

During the control process the software continuously analyses measurements results and displays them in the appropriate fields informing the user about the control results:



Where:

Product - Name of the controlled product

Code - Code of the controlled product

Q_n - Nominal value of the controlled product

$\bar{x}$ - Average mass of the controlled product

$\bar{x}_{LIM}$ - Disqualifying negative average value

$\frac{LIM}{\bar{x}}$ - Disqualifying positive average value

- Characteristics of sample's **T** negative errors (see: section 28.4 of this user manual)
- Characteristics of sample's **2T** negative errors (see: section 28.4 of this user manual).
- Characteristics of sample's **T** positive errors:
  4.5g - value of **T** positive error,
  T Max - permissible quantity of **T** positive errors,
  n - actual quantity of **T** positive errors.
- Characteristics of sample's **2T** positive errors:
  9g - value of **2T** positive errors,
  2T Max - permissible quantity of **2T** positive errors,
  n - actual quantity of **2T** positive errors.

Load full 1/30 - Prompt regarding process course.

Display of numeric data/graph.

- Abort control process.

Upon control completion, a report is generated, control is automatically saved to database.

CAUTION:

The template and example of the control report are to be found further down this user manual.

28.12. Reports

A report on determining average tare value	*A report on product control*
Average tare report: U/07/05/13/13/37/T ---------- Balance type XA 4Y Range 220 g Reading unit 0.001 g Balance S/N 303 Date 2013.05.07 13:37:30 Product product 1 Tare 33.447 g 0.25 T1 2.250 g Measurements quantity 10 Standard deviation 0.00483 g Method Statutory Result Positive Measurements 1. 33.440 g 2. 33.440 g 3. 33.440 g 4. 33.450 g 5. 33.450 g 6. 33.450 g 7. 33.450 g 8. 33.450 g 9. 33.450 g 10. 33.450 g ---------- Signature	----- PGC Report: U/06/05/13/14/17 ----- ---------- Balance type XA 4Y Range 220 g Reading unit 0.001 g Balance S/N 303 Start date 2013.05.06 14:15:49 End date 2013.05.06 14:17:04 Operator Product product 2 Batch number 99 Nominal mass 100 g Tare 0 g T1 error value 4.5 g 2T1 error value 9 g +T1 error value g +2T1 error value g Batch quantity 500 Measurements quantity 30 T1 errors quantity 0 2T1 errors quantity 0 Min 98.579 g Max 100.020 g Average 99.72983 g Sum 2991.895 g Average limit 99.70685 g Average limit [+] g Standard deviation 0.582804 g PGC mode Non-destructive average tare Result Positive Measurements 1. 100.008 g 2. 98.579 g 3. 98.582 g 4 . . . 28. 100.013 g 29. 100.012 g 30. 100.012 g ---------- Signature .....
Report template You can edit a template of a report on product control. To do it enter **<Printouts/ Average tare report printout template>** section. Only variables with <YES> attribute are printed on a report.	**Report template** You can edit a template of a report on product control. To do it enter **<Printouts/ SQC report printout template>** section. Only variables with <YES> attribute are printed on a report.

29. MASS CONTROL

(mode not available in balance's standard version)

<**Mass control**> is a working mode that allows you to control mass of a product that is automatically dispensed onto the weighing pan using balance-connected PA-02 automatic feeder. The mode automatically controls a complete batch of tested product (batch quantity parameter must be declared)..

29.1. Mass Control Global Settings

To enter Mass control mode settings press grey area workspace on the display and select "**Settings**" < > menu:

Request batch number	The parameter requests a batch number before starting mass control process.
Batch Quantity	The parameter determines quantity of a batch, i.e. number of product units to be controlled.
Min threshold	The parameter exceeding which causes accepting a measurement record by a balance.
Max threshold	The parameter exceeding which causes omitting a measurement in the summary, e.g. if two parts (pills) are simultaneously dispensed on the weighing pan.
Print report	The parameter switches on/off automatic printout of a report upon mass control process completion.
Printout	The parameter enables selecting whether, upon control process completion, a standard or a non-standard printout is to be printed out.

29.2. Mass Control Process

Prior to process start carry out the following steps:

- Set batch quantity for mass control process that is to be performed:

  Press grey workspace on a display and select **<Settings>** parameter.

  Next select **<Batch quantity>** parameter and enter quantity of units that are to be controlled in a current automatic mass control process. Press button to confirm.

- Set **<Min threshold>** below weight value of the smallest controlled piece. Select threshold value to avoid saving the measurement on the final report when the dispensed element has lower mass than the smallest element in controlled series (e.g. half of a pill).
- Set **<Max threshold>**. Select threshold value to avoid saving the measurement on the final report when the dispensed element has greater mass than the biggest element in controlled series (e.g. two elements dispensed at the same time). In case of the above situation, if **<Max threshold>** is set correctly, weighing instrument's software omits such measurement and continues mass control process.
- Set <**Dosing speed**> parameter for controlled product. The speed is determined in [%] between 0% and 100%. Set nominal mass and limits for errors: negative - <**T1-**> (Min) and positive - <**T1+**> (Max). Provide errors value in % of nominal mass value. The dosing power, mass and error parameters are to be determined **for each controlled product separately.**

It is impossible to determine <**T2-**> and <**T2+**> errors. Their values are doubled values of errors <T1-> and <T1+>.
Procedure – setting control parameters:
Press <**SETUP**> button in <**Mass control**> mode.
Select <**Databases**> and <**Products**> parameter.
Select product for which all values are to be selected. Set required parameters and return to home screen.

- Select controlled product from the products database **<** **>**.
- Set required parameters, press button to start automatic mass control.
- Automatic control is started. The weighing instrument is tared and the feeder starts dispensing the first element onto the weighing pan.
- With the first element on the weighing pan, the feeder pauses, the element is weighed; the first stable measurement is carried out.
- The measurement is saved, the weighing instrument is zeroed, the next element is dispensed onto the weighing pan. The weighing process is carried out analogously.
- The cycle is repeated until all pieces determined for <Batch quantity> process are weighed.
- The following information is displayed during control process:
  - Reference sample quantity
  - Product
  - Average,
  - Standard deviation
  - T1- errors quantity
  - T1+ errors quantity
- Upon completed measuring process of a particular batch, a report is generated, saved to balance's database and printed on a balance-connected printer.

CAUTION:

Each control process can be aborted if necessary, to abort a process press button. The process is stopped and control cancelled (no report is generated).

29.3. Printouts

Printouts option enables you to determine content of a particular standard printout, and to define non-standard printout.
Standard printout
Standard printout comprises four internal sections containing different variables.
Variable settings: YES – print; NO – do not print.

▪

Settings for header, weighing, and footer printouts are specified in section 14.5. For settings of mass control report read below.

CAUTION:
In order to specify which measurement data is to be printed on a report it is necessary to modify settings for <Weighing printout template> parameter. To enable particular measurement data printout set <YES> value for it.
Particular reports content:

- Working mode
- Date
- Time
- Balance type
- Balance S/N
- Report no.
- Operator
- Product
- Start date
- End date
- Batch number
- Reference sample quantity
- Nominal mass
- T2- threshold
- T1- threshold
- T1+ threshold
- T2+ threshold
- Measurements
- T2- errors quantity
- T1- errors quantity
- T1+ errors quantity
- T2+ errors quantity
- Mean
- Mean [%]
- Standard deviation
- Standard deviation [%]
- Empty line
- Dashes
- Signature
- Non-standard printout

29.4. Performed Mass Control Report

Upon each completed mass control process a report is generated. The report is saved to **<Mass controls>** database. Report files are named by the date and time particular process performance.

30. DATABASES

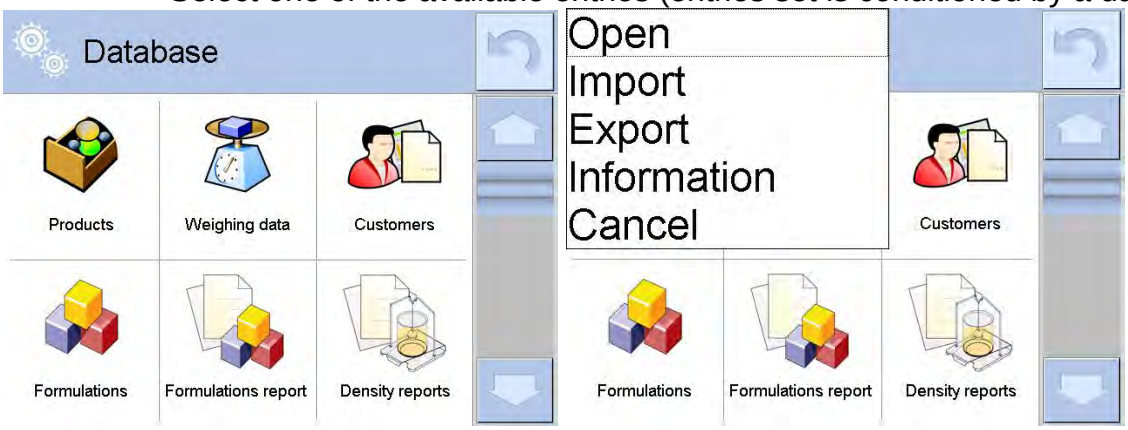
The module features the following databases <>:

PRODUCTS	WEIGHING RECORDS	CUSTOMERS
FORMULATIONS	FORMULATIONS REPORTS	DENSITY REPORTS
PRE-PACKAGED GOODS CONTROLS	AVERAGE TARES	PIPETTES
PIPETTE CALIBRATION REPORTS	SERIES	SQC REPORTS
MINIMUM SAMPLE WEIGHT	MASS CONTROLS	AMBIENT CONDITIONS
PACKAGES	WAREHOUSES	PRINTOUTS
UNIVERSAL VARIABLES	MANAGE THE DATABASE	

30.1. Database Connected Operations

Databases can be operated only by an authorized personnel.
Procedure:

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



Entries:

- OPEN – select to enter a database (alternative method for database entering: a single click on given database field).
- 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.
- EXPORT - select to export data from 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 has been saved and message: <Completed> is displayed. Confirm completion.
- INFORMATION – select to display information about database content (see the picture below).

Press button to return to the previous window.

CANCEL – select to return to the home screen.

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 carried out by pressing dedicated soft keys located on the top of the display. Follow the displayed commands.

30.2. Products

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

Procedure:

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

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. Dosing speed	[option for <Mass control> mode, determines in [%] (0% - 100%)feeder dosing speed. The value of dosing speed has to be determined by tests dependent on size, shape and mass of dispensed parts (pills)]
7. Min	[minimum mass for weighing the product using result control thresholds – LO. Value of <T1-> error for <Mass control> mode determined as percent of the nominal mass]
8. Max	[maximum 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]
9. Tolerance	[% value calculated in relation to mass (5) denoting measuring area in which the measurement is recognized as correct.]
10. Tare	[product's tare value, set automatically on selecting a product from the database]
11. Price	[unit price of a product]
12. PGC mode	[control mode (Non-destructive average tare, Non-destructive empty – full, Destructive full – empty, Destructive empty – full)]
13. Batch portion empty-	[measuring batch for control: Non-destructive

full, Destructive full – empty, Destructive empty – full]

14. Unit [product measuring unit]
15. Batch quantity [option available only for <PGC> mode, specifies controlled product batch quantity]
16. Interval of average tare determination [option available only for <PGC> mode, specifies minimum time interval needed for estimation of a packaging average tare; given in [h]; if software detects that pre-set time interval has passed, it displays a message: <**Estimate average tare**>. The message has informative character and you can decide whether to carry out the process or not.]
17. Packages quantity [option available only for <PGC> mode, specifies number of packages needed for estimation of average tare]
18. Internal control [option available only for <PGC> mode, allows for specification of internal control criteria accordant with company standards for a given product]
19. SQC [option available only for <SQC> mode, allows for specification of internal control criteria accordant with company standards for a given product]
20. Density [product's density, used as sample density for compensating air buoyancy] - [g/cm^3]
21. Shelf-life time in days
22. Date [Product's date (constant)]
23. VAT [VAT value related to a product]
24. Ingredients [Field for inserting names of product's ingredients or for requires additional description regarding product's features, application, etc.]
25. Printout [Template assigned to a product]

CAUTION:
Remember to assign products to corresponding functions, as some of data values are attributed according to their modes, e.g. thresholds in <Checkweighing> mode are set in [g], while thresholds in <Parts counting> mode are set in [pcs].

30.3. Weighing Records

Each weighing result sent from the weighing device to a printer is saved to weighing records database (see: section 16.1 *Result control*).
You can preview each weighing record data.

Procedure:

- Enter <**Databases** submenu.
- Enter **<Weighing records>** database and press respective record.

List of parameters defined for a weighing record:

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

30.4. Customers

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

Procedure:

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

.

List of parameters defined for a customer:

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

30.5. Formulations

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

Procedure:

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

Select already existing formulation.

List of parameters defined for a formulation:

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

30.6. Formulations Reports

Formulation reports provide information about carried out formulations. Each report can be previewed, searched by name, date, code or exported and printed out.

Procedure:

- Enter <Databases> submenu and press < Formulations reports> button.
  - Select report, if not visible, scroll the list using navigation buttons.
  - Report is named by date and time; e.g. 2011.10.12 15:12:15.

CAUTION:
It is possible to use 'search report' option.

List of formulations reports data:

1. Start date
2. End date
3. Formulation
4. Sum
5. Target value
6. Operator
7. Customer
8. Warehouse
9. Measurements quantity
10. Status

30.7. Density Reports

Density reports provide information about carried out density determination processes of solids, liquids and air. Each report can be previewed, searched by name, date, code or exported and printed out.

Procedure:

- Enter <Databases> submenu and press < Formulations reports> button.
  - Select report, if not visible, scroll the list using navigation buttons.
  - Report is named by date and time; e.g. 2011.12.12 11:12:15

CAUTION:
It is possible to use 'search report' option .

List of density reports data:

1.	Sample number	[field with a value, if in Density mode <YES> value is set for <Request sample number> parameter]
2.	Start date	
3.	End date	
4.	Density	[calculated density of a sample, liquid or air]
5.	Density	[calculated volume of tested sample, *density measurement of solid body*]
6.	Procedure	[depending on selected procedure, data contained on a report may change]
7.	Operator	[name of an operator carrying out the procedure]
8.	Product	[name of tested sample]
9.	Standard liquid	[name of a liquid used for determining density *of solid object*]
10.	Standard liquid density	[*density determination of solid object*]
11.	Temperature	[temperature of liquid used for carrying out a measurement, density determination of solid body]
12.	Sinker volume	[*density determination of a liquid*]
13.	Mass of steel standard	[*density determination of air*]
14.	Mass of aluminium standard	[*density determination of air*]
15.	Density of steel standard	[*density determination of air*]
16.	Density of aluminium standard	[*density determination of air*]
17.	Weighing 1	[mass measurement of tested sample or a sinker in the air, or mass of measured steel standard
18.	Weighing 2	[mass measurement of tested sample or a sinker in liquid, or mass of measured aluminium standard]

30.8. Control Reports

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

Control number format:
X / y y / M M / d d / H H / m m, where:

X – control type, marked as follows:
U – control regulated by the act,
Z – control completed by an operator,
W – control regulated by an internal criteria for PGC or SQC mode
yy - year of control end,
MM - month of control end,
dd - day of control end,
HH - hour of control end,
mm - minute of control end,
You can preview data on each control.

Procedure:

- Enter <**Databases**> submenu in accordance with section 30 of this user manual.

- Enter **<PGC>** mode and select a desired control record.

List of parameters defined for control:

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

30.9. Average Tares

(mode not available in balance's standard version)

Prior to **<Non-destructive average tare>** control you can determine average tare by packages weighing. Each process is automatically saved to <**Average tares**> database. Each control saved to the database features specific number assigned at the moment of control completion.

Control number format:
X / y y / M M / d d / H H / m m / T, where:

X – control type, marked as follows:
U – control regulated by the act,
Z – control completed by an operator,
W – control regulated by internal criteria,
yy - year of control end,
MM - month of control end,
dd - day of control end,
HH - hour of control end,
mm - minute of control end,
T - control with determining average tare value

You can preview data on each process of average tare value determination.

Procedure:

- Enter <**Databases**> submenu in accordance with section 30 of this user manual.
- Enter <**PGC**> mode and select a desired control record.

List of parameters defined for average tare:

1.	Product	[name of a product which packaging is subjected to average tare value determination]
2.	Status	[process status (result)]

3. Date [process performance date]
4. Tare [determined packaging tare value]
5. S [average standard deviation]
6. 0.25 T1 [the value of a criterion for process result]
7. Measurements quantity [quantity of carried out tare value measurements]
8. Operator [name of an operator carrying out the process]
9. Method [control method (regulated by the act or by internal criteria)]

30.10. Pipettes

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

Procedure:

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

List of parameters defined for pipettes:

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

30.11. Pipette Calibration Reports

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

Procedure:

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

CAUTION:
It is possible to use 'search report' option.

List of pipette calibration reports data**:**

1. Pipette [pipette name]
2. Serial no. [serial no. entered during calibration]
3. Channel no.

4.	Start date	
5.	End date	
6.	Operator	[name of an operator carrying out calibration]
7.	Customer	[customer name]
8.	Measurements quantity	[quantity of measurements for each tested volume]
9.	Operation with adherence to ISO 8655	[information if errors comply with the standard]
10.	Status	[information whether errors are below permissible values accepted for the tested volume]
11.	Temperature	[average temperature value during the process]
12.	Humidity	[average humidity value during the process]
13.	Pressure	[average pressure value during the process]
14.	Water temperature	[average water temperature during the process]
15.	Z coefficient	[coefficient value for given temperature]

30.12. Series

Series database contains series data and samples measurements.

Procedure:

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

List of parameters defined for series:

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

30.13. SQC Reports

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

Control number format:
y y / M M / d d / H H / m m / s s, where:
yy - year of control end,
MM - month of control end,
dd - day of control end,
HH - hour of control end,
mm - minute of control end,

ss - second of control end.

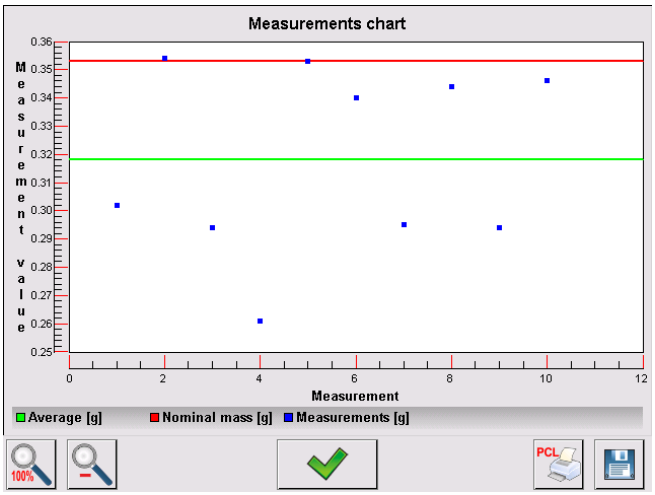
You can preview data on each control.

Procedure:

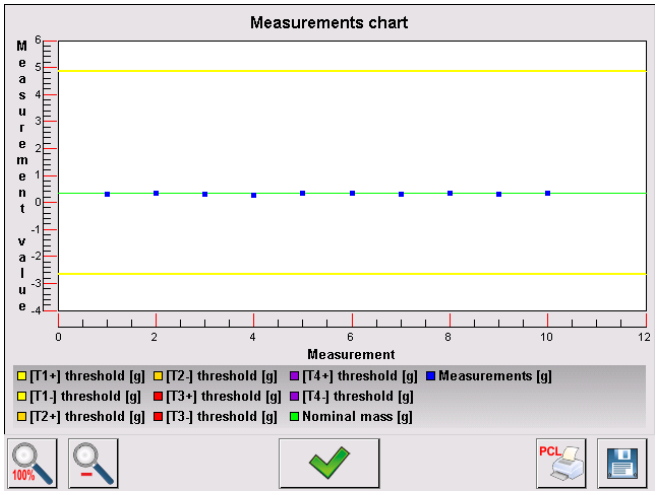
- Enter **<Databases>** submenu in accordance with section 30 of this user manual.
- Enter **< SQC reports>** database and press respective record.

List of parameters defined for control:

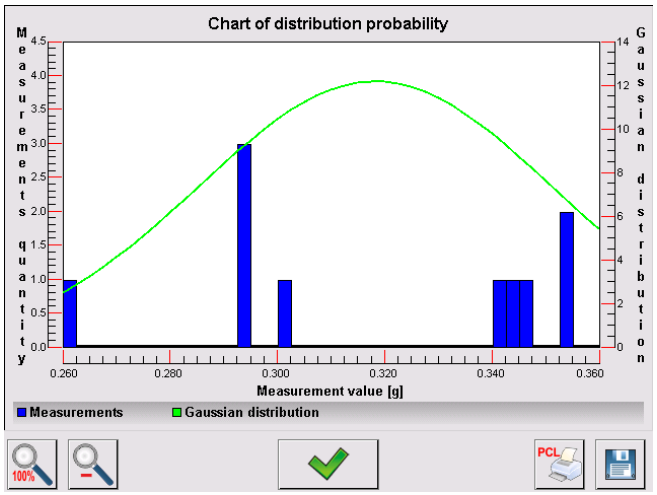
1. Batch number [batch number of controlled product]
2. Result [control status (result)]
3. Start date [control start date]
4. End date [control end date]
5. Product [name of controlled product]
6. Operator [name of an operator carrying out control]
7. Average [average value from carried out measurements]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



14. Control process graph with thresholds:



15. Probability distribution graph



30.14. Minimum Sample Weight

Minimum sample weight database contains data concerning declared methods and minimum sample weights.

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

Procedure:

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

List of parameters defined for minimum sample weights:

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

4. Subsequent control - a field for entering expiry date of the minimum sample weight. 2 weeks before the expiry date, a pictogram of a clock is displayed next to the status pictogram. Contact RADWAG representative to carry out necessary changes in minimum sample weight settings.
5. Thresholds – option that enables entering data on minimum sample weight mass and range of packaging mass (tare) with applicable criteria:
   Tare – maximum tare value, for which the minimum sample weight is obligatory. You can enter three characteristic quantities: 0.000g, optional mass within weighing instrument's measuring range, and maximum capacity (see: examples below).
   Minimum mass – value of the minimum sample weight determined for a particular weighing device on site with use of respective method.

Example no. 1 XA 220.4Y balance, d=0.0001 g:

List of MSW values determined for the following packaging values:

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

Example no. 2 XA 220.4Y balance:

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

Example no. 3 XA 220.4Y balance:

No.	*Tare value*	*Minimum sample weight*	*Overview*
1	0.0000 g	0.2500 g	Minimum sample weight refers to all net weight values when weighing is carried out without use of a tare container (<TARE> button NOT used). In case of such settings, the minimum sample

			weight is valid only when you weigh samples without use of tare containers. If taring function is used then pictogram informing on use of minimum sample weight goes blank and the software carries out weighing with tare (no determined minimum sample weight).

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

30.15. Mass Controls

(mode not available in balance's standard version)

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

Mass control number format:
y y / M M / d d / H H / m m, where:

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

You can preview data on each control.

Procedure:

- Enter **<Databases>** submenu in accordance with section 30 of this user manual.
- Enter **< Mass controls>** database and press respective record.

List of parameters defined for control:
<u>The reports contain the following information:</u>

	Batch number	Number of controlled batch
	Start date	Control process start date
	End date	Control process end date
	Operator	Operator carrying out control process
	Product	Controlled product
	Mean	Mean mass value determined during control
	Mean [%]	Mean mass value determined during control [%]
	Standard deviation	Standard deviation of carried out control
	Standard deviation [%]	Standard deviation of carried out control [%]
	T2- errors quantity	
	T1- errors quantity	
	T1+ errors quantity	
	T2+ errors quantity	

Batch quantity Controlled batch quantity determined in a report

Each report can be printed. To do that, select a report and display its details. <**Print**> pictogram is displayed. Press the pictogram to print out the report.
The database can be exported to a file. To do that, press **<Export to a file>** button.

30.16. Ambient Conditions

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

Procedure:

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

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

30.17. Packages

<Packages> 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:
It is possible to use 'search report' option.
CAUTION:
It is possible to use 'search report' option.

30.18. 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> entry.
- Press < Add> button to add a new warehouse, or
- Select an already existing warehouse.

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

30.19. Printouts

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

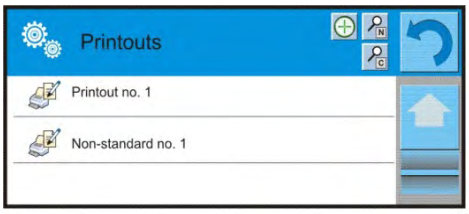
Procedure:

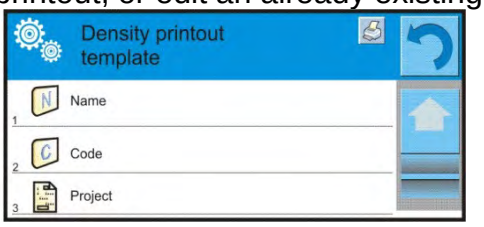
- Enter <Databases> submenu and press <Printouts> entry.
- Press <Add> button to add a new printout, or
- Select an already existing record.

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

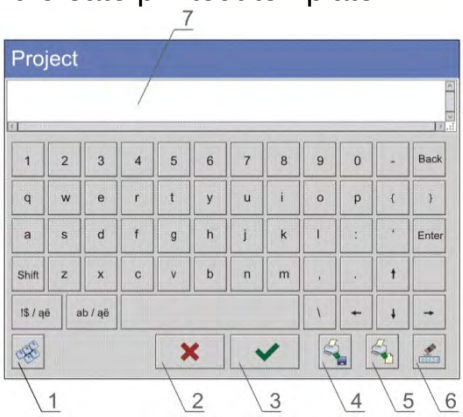
Designing new printout template

Procedure:

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



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

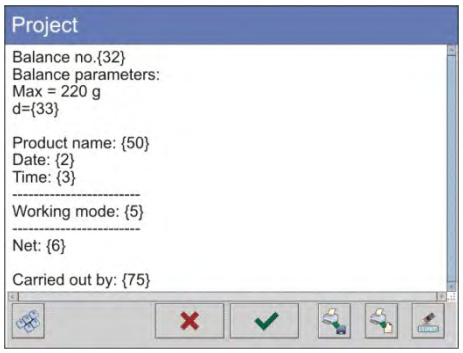


1 – zoom the edit box (7), recommended while using an external computer keyboard connected to module's USB port,
2 – cancel
3 – confirm
4 – download a printout template from a file
5 – display list of variables
6 – delete all printout content
7 – edit box

- Save designed printout.

CAUTION:
To delete characters press Back key. To move cursor, press navigation keys.

Example of Printout no. 1 – large edit box



Project

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

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

Working mode: Weighing

Net weight: 94.147

Carried out by: Admin

Printout template

Example of Printout no. 2 – printout from a file

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

Procedure:

- Design a *.txt or *.lb file in an optional editor.
- Copy the file to a USB flash drive.
- Connect the USB flash drive to module's USB port.
- Press [4] < Download a printout from a file> button.
- Module's display shows data stored on the USB flash drive connected to the USB port.
- Select file with printout template and press its name.
- The printout template is automatically copied to an editing field.

30.20. Universal Variables

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

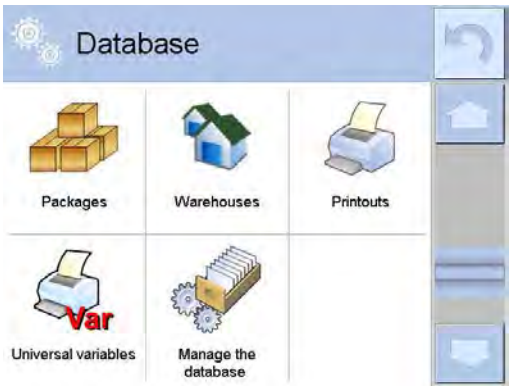
Procedure:

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

CAUTION:
It is possible to use 'search report' option.

30.21. Databases Management

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

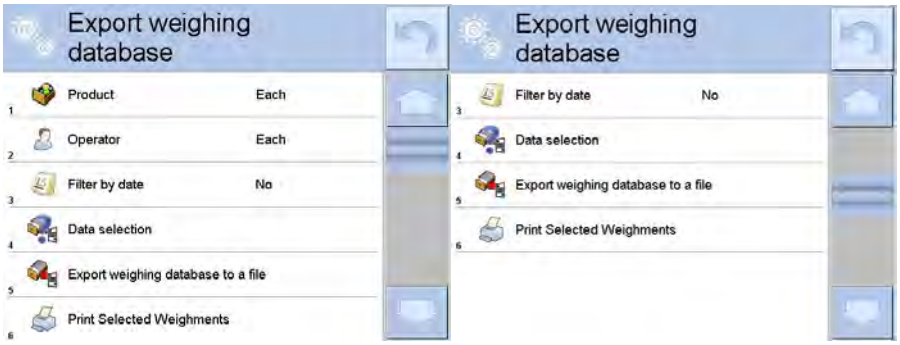


30.21.1. Export Weighing Database to a File

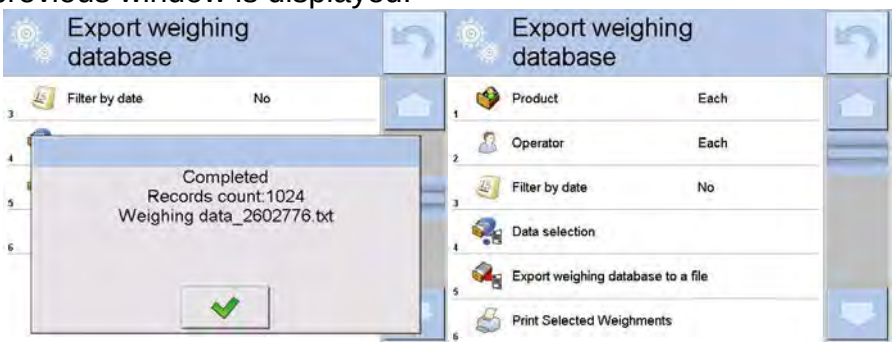
All measurements are saved to <Weighing records> database and can be exported to a file using a USB flash drive.

Procedure:

- Connect the USB flash drive to USB A 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 data related to measurement is to be exported.

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

- You may return to a 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 created file:

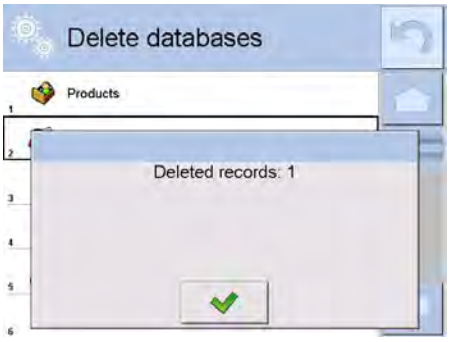
The file is created in a form of chart, columns of which are separated with <Tab>. This allows for direct export of the file to <Excel> spread sheet document. The chart contains the following data: date and time, mass and mass unit, tare and tare unit, serial number,

operator name, customer name, packaging name, source warehouse name, target warehouse name, control result name.

30.21.2. Delete Databases

Function allowing to delete data of selected database. Upon function activation, window with databases list is displayed, select database, delete respective data.

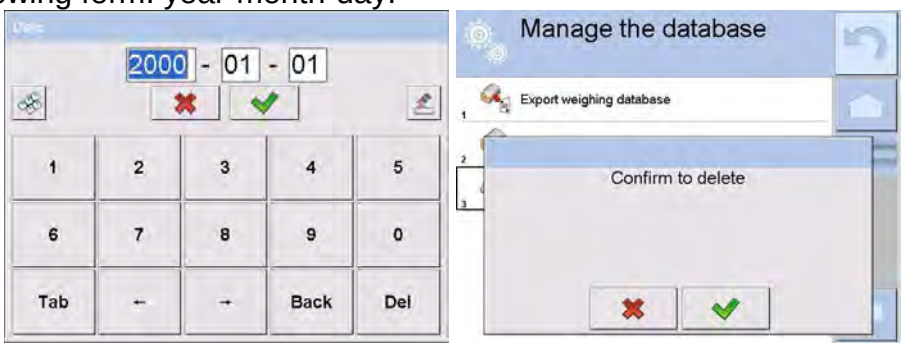
Upon confirmation, data is deleted and the following message is displayed:



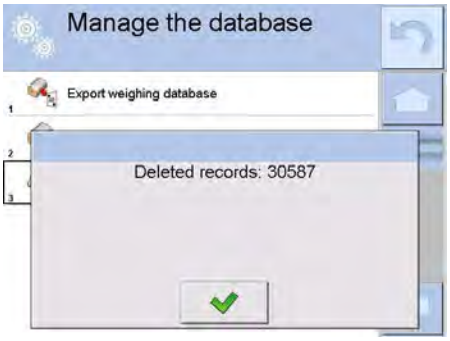
Upon confirmation the software returns to a previous window; you may continue weighing or proceed to other operations.

30.21.3. Delete Weighings and Reports

Function allowing you to delete weighings and reports of a given database. Activate <Delete weighing records and reports> parameter, a window with a numeric keyboard is displayed. Using the keyboard, enter a date specifying which data is to be removed. Date is given in the following form: year-month-day.



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



31. COMMUNICATION

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

- COM 1 (RS232),
- COM 2 (RS232),
- Ethernet
- Wi-Fi,
- TCP

The ports are to be configured in < Communication> parameter.

Enter <Communication> parameter and press SETUP key and next press:

< Communication> button.

31.1. RS 232 Settings

Procedure:

- Select communication port < COM1> or < COM2>.
- Configure ports.

There are following 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

31.2. ETHERNET Settings

Procedure:

- Select communication port < Ethernet>. Set the following parameters:

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

CAUTION:

Above settings are for information purpose only. Transmission parameters have to be selected in accordance with the settings of customer's local network.

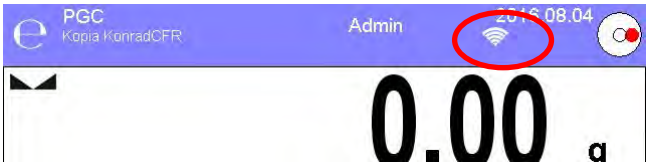
Upon completing modifications, press button, the following message is displayed:

<Restart balance to implement changes>.

Return to weighing mode and restart the device.

31.3. Wi-Fi Settings

Balance equipped with Wi-Fi module displays respective pictogram:



Procedure:

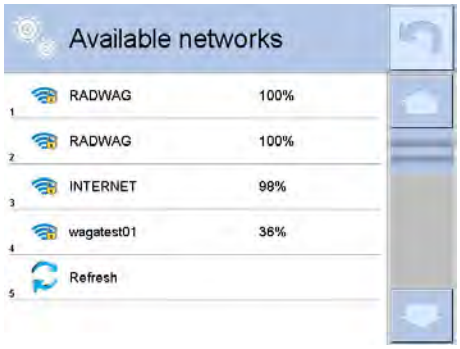
– Select < Wifi> communication interface. Set the following parameters:

- DHCP: Yes – No
- IP Address: 10.10.9.155
- Subnet mask: 255.255.255.0
- Default gate: 10.10.8.244

CAUTION:
Above settings are for information purpose only. Transmission parameters have to be selected in accordance with the settings of customer's local network.

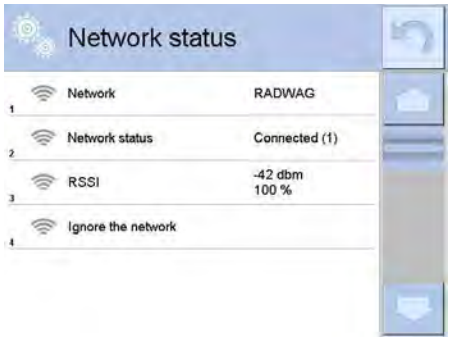
Upon completing modifications, press button, the following message is displayed:
<Restart balance to implement changes>.
Return to weighing mode and restart the device.

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



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

Press <Network status> field to check selected network parameters. The following message is displayed:



The selected network and connection parameters are saved to 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. Given network gets disconnected.

31.4. TCP Settings

TCP (*Transmission Control Protocol*) operating in customer-server mode enables communication of two computers. You can establish connection on a port specified by server.

Procedure:

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

32. PERIPHERALS

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

32.1. Computer

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

Procedure:

- Press SETUP key and next press <Peripherals/Computer>.
- Set parameters related to cooperation with a computer.
  - Computer port
    Available options: none, COM 1, COM 2, Tcp,
  - Address
    Give address of balance connected to a computer,
  - Continuous transmission
    Available options: NO, YES *(printout format is conditioned by set weighing printout template – see parameter below),*
  - Interval:
    Parameter enables setting printout frequency for continuous transmission. Printout frequency is set in seconds, with 0.1s accuracy.
    You can set frequency in a range from 0.1 to 1000 seconds for continuous transmission activated using module and computer.
  - Printout template for weighing
    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 30.19 of this user manual*).
  - E2R System
    E2R System performs supervision and control over all weighing processes carried out using mass comparator. With E2R system activated some databases can be operated using computer exclusively (access to specified functions and options using weighing instrument is not possible).

CAUTION:
*<**E2R System**> can only be activated by balance manufacturer or by authorized personnel.*
To provide correct cooperation with E2R System, continuous transmission has to be activated.

32.2. Printer

<Printer> submenu allows you to:

- set port for establishing communication with a printer,
- define printer's code page (by default: 1250),
- define control codes for PCL printer or EPSON receipt printer.
  Caution: Codes must be entered in a hexadecimal form!
- define printout templates.

Speed of transmission respective for a printer (see: Printer settings) must be selected for the module to ensure its right cooperation with a printer (diacritical signs specified for a given language). Additionally, printout and printer code pages must be identical.
Code page accordance may be obtained as follows:

- by setting the right code page in the printer (see the printer manual) – respective to printout code page set in a module; or
- by sending control code, from a balance to the printer, which automatically sets the right code page (respective to code page set in a balance) in advance before execution of the data printout – it is possible only for printers equipped with such option.

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

1. EPSON TM-U220x Dot matrix printer

Communication parameters:

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

Printer's parameters:

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

2. EPSON TM-T20 2. Thermal printer

Communication parameters:

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

Printer's parameters:

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

Printer's parameters:

- *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 case the <CONTROL CODES> parameter setting has to be as follows: control codes – **1B74121B5203**
A printout template describes <u>how to print information from databases</u>.
The template can be modified. In order to check format of printout template, print data related to e.g. product parameters. – function activated on moving to <Products/Edit product> database and pressing printer pictogram.

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

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----------
Date and time {275}
Temperature of sensor 1: {value} ^{o}C
Temperature of sensor 1: {value} ^{o}C
THBS temperature: {value} ^{o}C
THBS humidity: {value} %

Formulation printout template

---------- Formulation ----------
Formulation name: {165}

Ingredients quantity: {167}
Target mass: {168} g
Formulation ingredients:

{169}

32.3. Barcode Scanner

The scale enables cooperation 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 weighings
- Universal variables,

To configure barcode scanner enter:
„SETUP / Peripherals/ Barcode scanner”**.**

CAUTION:
Enter ***<Communication>*** *submenu and set baud rate for a barcode scanner (by default 9600b/s). For detailed description of 'module' - 'barcode scanner' communication read* ***APPENDIX E*** *of this user manual.*

32.3.1. 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

32.3.2.Prefix/Suffix

You can edit **<Prefix>** and **<Suffix>** to synchronize mass comparator’s software with 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 'module' - 'barcode scanner' communication read **APPENDIX 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 **<Prefix>** parameter and enter hexadecimal value using the on-screen keyboard. Press button to confirm.

32.3.3.Field Selection

Parameter allowing you to specify, 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:

Product

Operator

Customer

Series

Universal variable 1

Universal variable 2

Packaging

Warehouse

Formulation

Pipette

Universal variable 3

Universal variable 4

Universal variable 5

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

	Filtering	Declaring search criteria (see table below)
	Offset	Declaring the first significant code's character for which searching is carried out. All preceding characters are omitted.
	Code length	Declaring the quantity of code's characters to be taken into account during search procedure.
	Start marker	Declaring the starting point of scanned code used for searching.
	End marker	Declaring the ending point of scanned code used for searching.
	Ignore marker	Determining whether start and end markers are to be used when comparing 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

32.3.4.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 field and HEX filed, next the test result is displayed in the bottom part.

When:

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

32.4. Transponder Card Scanner

You can log in to the balance by means of:

- password entered using an on-screen keyboard,
- registered transponder card scanner.

CAUTION:

*For correct 'balance - transponder card scanner' cooperation set appropriate baud rate value in <**Communication**> submenu (by default 9600b/s).*

Transponder card scanner port

Communication between the weighing device and the transponder card scanner can be established via the following ports:

- RS 232 (COM1)
- RS 232 (COM2)

In order to log in an operator via transponder card scanner, first assign a number of an already registered card to a selected operator in the database of operators.

Procedure:

- Connect a transponder card scanner to a given port (RS 232 COM1 or RS 232 COM2), select communication port for 'balance-transponder card scanner' communication.
- Go to< Communication> submenu and set baud rate compatible with baud rate of the transponder card scanner (by default 9600b/s).
- Enter operators database, go to <RFID Card no.> parameter and edit desired operator's record.
- Upon entering editing mode in <RFID Card no.> parameter, a <Card no.> edit box is opened with an on-screen keyboard.
- Approximate the card to the transponder card scanner. The mass comparator automatically displays number of detected card in the <Card no.> field.
- Accept recognized number by pressing button and return to weighing.

32.5. Additional Display

Communication between the weighing device and the additional display can be established via the following ports:

- RS 232 (COM1)
- RS 232 (COM2)
- TCP

Type of data displayed on an additional display is declared in <Project> variable.

Procedure – designing a variable:

- Enter <Peripherals> submenu.
- Select <Additional display/Project> parameter, a <Project> edit box with an on-screen keyboard is displayed.
- Use the on-screen keyboard to insert desired value of a project, or press < > button and select respective value from the list.
- Press button to confirm.

CAUTION:
*The balance cooperates with RADWAG WD5/3Y additional display. In order to ensure correct cooperation between the balance and the additional display, set **{140}** variable for <Project> parameter, next set 38400 bits/s baud rate for a port to which the additional display is connected.*

32.6. Ambient Conditions Module

Ambient conditions module (THB) can be connected to the balance via COM 1 or COM 2 port. In order to provide correct cooperation enter module's 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 an ambient conditions module data plate).

32.7. Automatic Feeder

(mode not available in balance's standard version)

Communication between the weighing device 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 an automatic feeder data plate).

33. INPUTS/OUTPUTS

Application of inputs:
The set of inputs is used to control module's operation. The following functions or keys can be assigned to each of 4 inputs:

- o Checkweighing thresholds
- o Target value
- o Right door
- o Parameters

- o Profile
- o Adjustment
- o Zero
- o Tare
- o Set tare
- o Disable tare
- o Restore tare
- o Packaging
- o Print
- o Header printout
- o Footer printout
- o Universal variable 1÷ 5
- o Accept
- o Abort
- o Operator
- o Left door
- o Statistics
- o Add to statistics
- o Product
- o Warehouse
- o Customer
- o Parts counting: set part mass
- o Parts counting: determine part mass
- o Percent weighing: set reference mass
- o Percent weighing: set 100%
- o Solid density
- o Liquid density
- o Air density
- o Automatic Weight Crane Control
- o Task
- o Reference weight

Upon change of the logic state of the input system, e.g. from [0] to [1], a function that is assigned to the system is carried out. For instance:

- automatic balance adjustment,
- display of set checkweighing threshold values,
- restoring tare value.

Procedure:

- Press SETUP key, next press: <Inputs/Outputs> button.
- Enter <Inputs/Outputs> submenu and select <Inputs> parameter.
- Edit a selected input; list of available functions is displayed.
- Select a given function and return to weighing.

Application of outputs:
Outputs are used to SIGNAL the status of measurement result. Change of logic status of the output system, e.g. from [0] to [1], takes place on meeting a requirement assigned to the output.

The following data can be assigned to each of 4 outputs:

Option	Module status switching output logic.
None	-------
Stable	Each stable measurement switches the logic state.
MIN stable.	Stable measurement below [MIN] threshold switches the logic state.
MIN unstable.	Unstable measurement below [MIN] threshold switches the logic state.
OK stable.	Stable measurement within [MIN] [MAX] thresholds

	switches the logic state.
OK unstable.	Unstable measurement within [MIN] [MAX] thresholds switches the logic state.
MAX stable.	Stable measurement above [MAX] threshold switches the logic state.
MAX unstable.	Unstable measurement above [MAX] threshold switches the logic state.
Confirmation of cycle completion	End of procedure.

Procedure:

- Press SETUP key, next press: <Inputs/Outputs> button.
- Enter <Inputs/Outputs> submenu and select <Outputs> parameter.
- Edit a selected output; list of available functions is displayed.
- Select given function from the list, next return to weighing and save changes.

34. MISCELLANEOUS

This menu contains parameters facilitating balance operation. To enter <Misc.> submenu, press SETUP key, next press <Misc.> button.

34.1. Interface Language

Procedure:

Enter < Misc.> submenu.

Select <Language> parameter and select language.
Available languages: Polish, English, German, French, Spanish, Korean, Turkish, Chinese, Italian, Czech, Romanian, Hungarian, Russian.

34.2. 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>** parameter**.**

Enter date and time settings, an on-screen keyboard is displayed. Set date and time: year, month, day, hour, minute. Press button to confirm.

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

Pictogram	Name	Value	Overview
	Time zone	(UTC+01:00) Sarajevo, Skopje, Warsaw, Zagreb	Parameter value: name of time zone/country, which informs of summer/winter time change. The information comes from Microsoft website.
	Automatically adjust clock for daylight saving	Yes	Function enables or disables automatic clock adjustment. Upon parameter change restart the balance.

	Date and time	2016.04.04 08:00:00	Enter this parameter to set internal clock and date.
	Date format	yyyy.MM.dd *	Enter this parameter to select date format. Available values: 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. Available values: 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

*) - 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 administrator in <Permissions> menu.

34.3. „Beep" Sound

Procedure:

Enter <Misc.> submenu, select <Beep> parameter and set appropriate value:

None	-	Beep sound disabled for keys/buttons and proximity sensors
Keys/Buttons	-	Beep sound enabled for keys/buttons
Sensors	-	Beep sound enabled for proximity sensors
All	-	Beep sound enabled for keys/buttons and proximity sensors

34.4. Volume

You can change volume of the loudspeaker mounted in the weighing indicator.
Procedure:
- Press SETUP key, go to <Misc./Volume> submenu.
- An on-screen keyboard is displayed.
- Enter volume in percent: 100% - maximum volume, 0% - minimum volume (loudspeaker off).

34.5. Sleep Mode

You can turn on display sleep mode.
Procedure:
- Press SETUP key, next go to: <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:
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 mass comparator returns to weighing.

34.6. Display Brightness

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

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

34.7. Touch Panel Calibration

Display calibration is required if the touch panel does not react correctly during operation.

Procedure:

- Enter <Misc.> submenu.
- Select <Touch panel calibration> parameter, an edit box is displayed.
- Use finger or a thin , soft stylus to press and hold a display area with a cross. After pressing the fifth cross in order, accept the changes by pressing key.

CAUTION:
The process can be aborted by pressing Esc key on an external keyboard connected to the balance indicator.

34.8. Level Control

The balance is equipped with Automatic Level Control mechanism. You can define its operation for non-verified devices.

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

Procedure:

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

CAUTION:
For detailed information on mass comparator levelling refer to section 10.3 of this user manual.

34.9. Proximity Sensors Sensitivity

The parameter is adjustable between 0 – 9, and it determines the distance from which the IR proximity sensors react.
Default value ranges between 5 and 7.

Procedure:

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

34.10. Proximity Sensors Timeout

Parameter for setting timeout of proximity sensors expressed in [ms].
Default value: <0>.
When you use the option of motion recognition set <Proximity sensors timeout> parameter to <**500ms**> value.

Procedure:

- Enter <Misc.> submenu.
- Select <Proximity sensors timeout> parameter, an on-screen keyboard is displayed.
- Enter <500> value.
- Confirm. Menu is displayed.

34.11. 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 regular optimisation of balance settings which is necessary in

order to maintain the best possible repeatability and weighing time at the workstation. The function allows you to monitor the parameters at optional moment and save records from carried out tests.

There are two modules:
AUTOTEST FILTER; AUTOTEST GLP.
Prior 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. Optimum 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 balance memory until it is turned off,

- test results printout,
- direct and fast selection of optimal parameters.

Upon completed autotest, a summary with results is displayed.
Information regarding filters settings is provided automatically via display of respective pictograms: - settings providing the fastest measurement (the shortest measurement time).

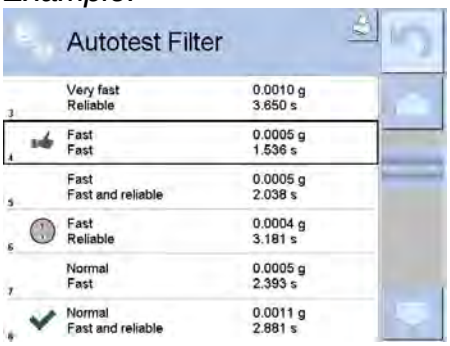
- settings providing the most accurate measurement (the lowest possible value of deviation for 10 measurements).

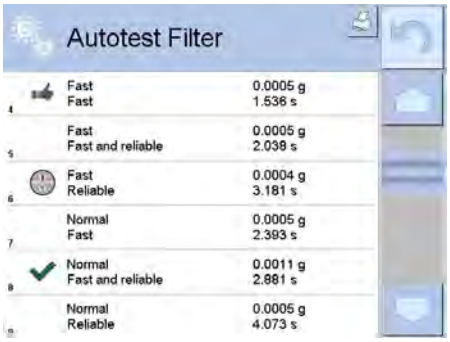
- settings providing optimal measurement (the lowest value of time and deviation product).

- current settings for filters.

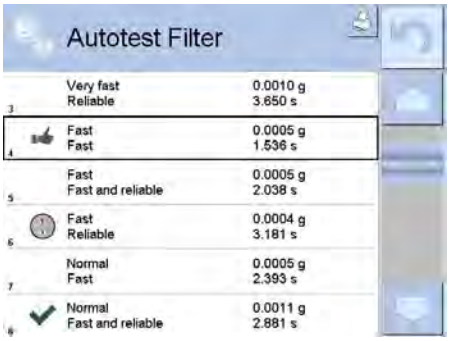
Measurement results:
*Filter type.
* <Value release> parameter value.
*Repeatability of indications expressed as standard deviation.
*Average time of measurement stabilization.

Example:





You can quickly modify ‘filter’ and ‘value release’ settings. To do that, select results for particular settings that are to be saved. Press <Activate>.



Report example:

-------- Autotest Filter: Report --------
Balance type XA 4Y
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 °C
Temperature: Stop 25.66 °C

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

Signature
.....

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

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

AUTOTEST GLP
The test controls repeatability of loading the internal weight and determining error of indication with reference to module’s maximum capacity.

Procedure:

- Two times loading of the internal weight, followed by 10 times loading of the internal weight.
- Adjust the weighing instrument,
- Calculating and recording the value of standard deviation.
- In weighing instrument with automatically opened doors, door opening and closing test is carried out.

Autotest GLP function enables:
Report display and printout,
Record of a report containing basic balance data, ambient conditions 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 4Y
Balance S/N 400010
Operator Admin
Software ver. L0.0.21 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 & reliable

Deviation for Max. -0.0118 g
Repeatability 0.00088 g
Signature

.....

Procedure:

Press entry with test name, a message box is displayed.
You can:

- Start subsequent AUTOTEST GLP process,
- Preview results of completed autotests, and export all saved test results as file with *.csv extension,
- 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 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 balance USB port as a file with *.csv extension.

34.12. Start-Up Logo

(option enabled only for authorized mass comparator operators)

The parameter enables you to change logo that is displayed on balance start-up.

34.13. Export of System Events

(option enabled only for authorized mass comparator operators)

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

Procedure:

- Plug a USB flash drive to mass comparator's 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.

35. UPDATE

Update function enables update of:

- Help files available from the operator level.
- Application.
- Metrological parameters: main board (administrator exclusively).

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

Procedure:

- Prepare a USB flash drive with update file. Required file extension: **.lab2.*
- Connect the USB flash drive to balance USB port.
- Select <Application> entry.

- The display previews content of the USB flash drive, search for the update file and press its name.
- Updating proceeds automatically.

Update of help files and the main board file is analogous; required files extensions are: *.hlp - help, *.mbu – main board.

36. ABOUT

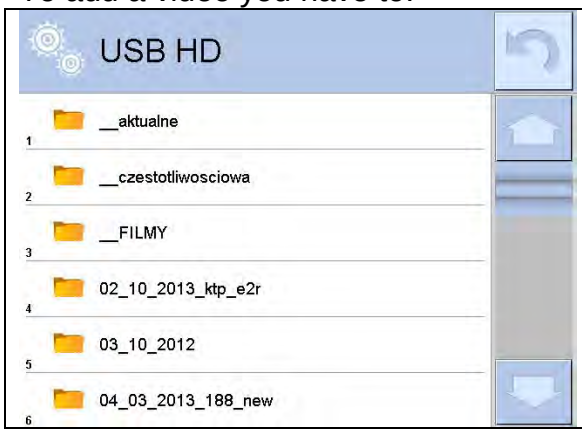
'About' menu provides information on balance and balance program. Most of parameters in this menu are for the information purpose only.

<Ambient conditions> parameter enables preview of present ambient conditions: temperature, humidity, pressure (if the balance features ambient conditions sensors).
<Print settings> parameter enables you to send all parameters to printer port.

37. VIDEOS

Videos menu enables display of instruction videos (*.wmv) presenting how to operate the balance. Administrator can add/delete videos. Remaining operators may only watch the videos stored in the balance memory.

To add a video you have to:



- Save the video on a USB flash drive.
- Plug the drive to the USB port.
- Enter <Videos> menu.
- Press < > button.
- Select respective file.
- The video is saved to the balance memory.

To play the video you have to:

- Save the video to the balance memory (see instruction above).
- Enter <Videos> menu.
- Press the name of a video to be played.

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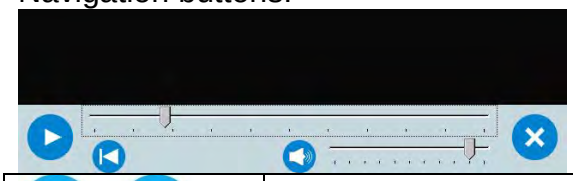
The video starts automatically.
Navigation buttons:



	Play/ Pause playing
	Stop playing
	Increase/decrease the volume (volume power adjusted, for settings go to <Misc.> menu).
	Enabling/Disabling the volume
	Restart video

38. COMMUNICATION PROTOCOL

GENERAL INFORMATION

A. A character based communication protocol (balance-indicator) is designed for establishing communication between a RADWAG balance and a peripheral device via 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.

38.1. 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 module serial number
PROFILES	Set balance profile
PRG	Give set profile name
LOGIN	Operator logging
LOGOUT	Operator logout
SS	Value release
IC	Internal adjustment performance
IC1	Disable automatic internal adjustment of the module
IC0	Enable automatic internal adjustment of the module
K1	Lock scale keypad
K0	Unlock scale 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 module type
FS	Give max capacity
RV	Give program version
A	Set AUTOZERO function
EV	Set ambient conditions state
EVG	Give set ambient conditions state
FIS	Set filter
FIG	Give current filter setting
ARS	Set value release
ARG	Give current value release setting
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.

38.2. Response Format

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

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

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 - 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 - 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_MASA 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_MASA 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 stable measurement result

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

Disable automatic internal adjustment of the module

Format: **IC1 CR LF**

Response options:

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

IC1_E CR LF - operation not possible, e.g. in case of verified module

IC1_OK CR LF - command carried out

Operation not possible for verified modules.
For non-verified balances the command disables internal adjustment until it is enabled via IC0 command or until the balance is turned off. The command does not change module settings that concern factors determining adjustment process start.

Enable automatic internal adjustment of the module

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 not possible for verified modules.

Give balance serial number

Format: **NB CR LF**

Response options:

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

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

x - module serial number, inserted in between inverted commas

Example:

Command: NB CR LF - give serial number

Response: NB_A_”1234567” - module serial number - ”1234567”

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

Unlock scale 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 given on a particular balance display, it is provided in a currently selected language.

n - parameter, decimal value determining working mode number.

n →
1 – Weighing
2 – Parts counting
3 – Percent weighing
4 – Dosing
5 – Formulations
6 – Animal Weighing
8 – Solids density
9 – Liquids density
10 – Peak hold
12 – Checkweighing
13 – Statistics

Caution:
Working 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> 4_” Dosing” <CR><LF> 12_” Checkweighing” <CR><LF>	- return accessible working modes, mode number + name
	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> 12 <CR><LF>	- return accessible working modes and mode number,
	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 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 indicator sent all implemented commands.

Give balance type

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

Response options:

BN_A_”x” <CR><LF> - command understood, response: module type

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

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

Command:	BN <CR><LF>	- give module type
Response:	BN_A_”AS”	Balance type XA 4Y

Give max capacity

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

FS_A_”x” <CR><LF>	- command understood, response: module 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>	- return 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>.

Give set ambient conditions state

Command overview:

Command gives information about state of currently set ambient conditions.

Format: **EVG<CR><LF>**

Response options:

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

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

x - parameter, ambient conditions symbols

Example:

Command: EVG<CR><LF> - give current ambient conditions state

Response: EVG_0_OK<CR><LF> - current ambient conditions state: 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 balance 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

Give current filter setting

Command overview:

Command gives information about currently set filter.

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

Response options:

FIG_x_OK<CR><LF>	- command carried out, response: currently set filter
FIG_I <CR><LF>	- command understood but not accessible at this moment

x - parameter, symbol of currently set filter

Example:

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

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

Example:

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

Give current value release setting

Command overview:

Command gives information about current value release setting.

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

Response options:

ARG_x_OK<CR><LF>	- command carried out, response: current value release setting
ARG_I <CR><LF>	- command understood but not accessible at this moment

x - parameter, symbol of current value release setting

Example:

Command:	ARG<CR><LF>	- give current value release setting
Response:	ARG_2_OK<CR><LF>	- current value release setting: fast+reliable

Set last digit

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

Response options:

LDS_OK<CR><LF>	- command carried out
LDS_E <CR><LF>	- error in-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.

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

Example:

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

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 set profile name

Format: **PRG CR LF**

Response options:

PRG_A_”x” CR LF	- command understood, response: profile name
PRG_I CR LF	- command understood but not accessible at this moment

x - profile name (in between inverted commas)

Example:

Command:	**PRG** CR LF - give profile name
Response:	**PRG** _A_”Fast” – profile name –-”Fast”

Profile selection

Format: **PROFILE_*Name* CR LF**

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

Response options:

PROFILE OK CR LF - command understood, new profile set

LOGIN ERROR CR LF - command understood, an error in name, profile setting impossible

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

38.3. Manual Printout / Automatic Printout

- It is possible to generate printouts either manually or automatically. Manual printout: upon indication stabilization press key.
- Automatic printout is generated automatically in accordance with the parameters set for automatic printout (read section 14.5 of this user manual).

The content of printout depends on settings of <Standard printout> parameter - <Weighing printout template> (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, with reference to <Weighing printout template> settings, from a weighing device upon pressing key:

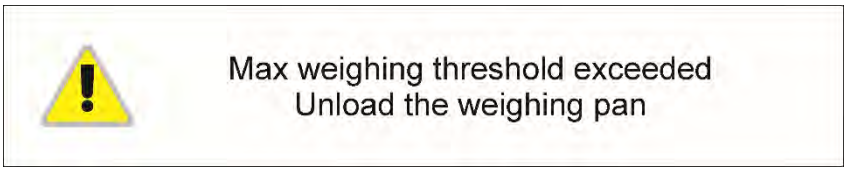
N (measurements quantity)	**NO**	Universal variable 1 … 5	**NO**
Date	**NO**	Net	**NO**
Time	**NO**	Tare	**NO**
Level status	**NO**	Gross	**NO**
Customer	**NO**	Current result	**NO**
Warehouse	**NO**	Additional unit	**NO**
Product	**NO**	Mass	**Yes**
Packaging	**NO**	Non-standard printout	**NO**

39. CONNECTING PERIPHERALS

The module can cooperate with the following peripheral devices:

- computer,
- receipt printer: KAFKA, EPSON,
- PCL printer,
- additional display,
- barcode scanner,
- an optional peripheral device operating ASCII communication protocol.

40. ERROR MESSAGES



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 In-course process resulting in unstable measurement (automatic feeder – pills feeding process or comparator – load change process)

41. ACCESSORIES

Type	Name
P0136	RS232 cable for KAFKA printer
P0151	RS232 cable for EPSON printer
KAFKA	Thermal printer
EPSON	Dot matrix printer
	PCL printer
WD- xx	Additional display in plastic housing
CK-01	Transponder card scanner
LS2208	Barcode scanner

AP2-1	Power loop output
SAL	Anti-vibration bench for XA laboratory balances
	PC keyboard.

Computer software:

- **„LABEL EDITOR”**
- **„PW-WIN”**
- **„RAD-KEY”**

42. APPENDIX A - Printout Variables

42.1. 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}	Standard printout in adjustment unit
{1}	Standard printout in current measuring 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 in adjustment unit
{9}	Tare in adjustment unit
{10}	Current measuring unit
{11}	Adjustment unit.
{12}	Min threshold
{13}	Max threshold
{15}	Statistics: Number
{16}	Statistics: Sum
{17}	Statistics: Mean
{18}	Statistics: Minimum
{19}	Statistics: Max

{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}	Additional unit
{45}	Target value
{46}	Tolerance
{47}	Difference
{48}	Balance type
{50}	Product: Name
{51}	Product: Code
{52}	Product: EAN code
{53}	Product: Mass
{54}	Product: Tare
{55}	Product: Price
{56}	Product: Minimum
{57}	Product: Maximum
{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: TIN
{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}	Epson printer: Paper crop
{151}	PCL printer: Form feed
{155}	Cooperation with RADWAG CONNECT
{165}	Formulation: Name
{166}	Formulation: Code
{167}	Formulation: Ingredients quantity
{168}	Formulation: Sum
{169}	Formulation: Ingredient
{170}	Formulation: Ingredient number
{175}	Formulation report: Start date
{176}	Formulation report: End date

{177}	Formulation report: Sum
{178}	Formulation report: Target value
{179}	Formulation report: Difference
{180}	Formulation report: Measurements quantity
{181}	Formulation report: Status
{182}	Formulation report: Measurements
{188}	Ingredient: Target mass
{189}	Ingredient: Difference
{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:

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

42.2. Variables Formatting

You can format numerical variables, text variables and dates 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 variable from format item	**{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}	Date in EAN 128 code
{61:yyMMdd}	Product date in EAN 128 code
{62:yyMMdd}	Product expiry date in EAN 18 code

43. APPENDIX B – Programmable Buttons List

Pictogram	Name	Pictogram	Name
	Profile selection		Right door opening/closing
	Adjustment	Open Close	Open / close door
	Zeroing		Parameters
	Taring		Products
	Tare setting		Warehouses
	Disable tare		Customers
	Enable tare		Help
	Packaging selection	2.47	Parts counting: Set part mass
	Print	10..20..	Parts counting: Determine part mass
	Header printout	5	Parts counting: Reference sample quantity - 5 pcs.
	Footer printout	10	Parts counting: Reference sample quantity - 10 pcs.
[ct] [g]	Units	20	Parts counting: Reference sample quantity - 20 pcs.
Var 1	Edit universal variable 1	50	Parts counting: Reference sample quantity - 50 pcs.
Var 2	Edit universal variable 2	100	Parts counting: Reference sample quantity - 100 pcs.

	Edit universal variable 3		Parts counting: Assign reference sample mass to product
	Edit universal variable 4		Pipettes
	Edit universal variable 5		Differential weighing: Series
	Checkweighing thresholds		Differential weighing: Sample
	Statistics		Differential weighing: Tare
	Add to statistics		Differential weighing: Weighing A
	Target value		Differential weighing: Weighing B
	Percent weighing: Set reference sample mass		Differential weighing: Weighing T and A
	Percent weighing: Set 100%		Differential weighing: Deleting value
	Density: Solids density		Differential weighing: Copy tare
	Density: Liquid density		Differential weighing: Add sample
	Density: Air density		Moisture analyzer: Drying mode
	Animal weighing		Moisture analyzer: Drying chart
	Formulation		Moisture analyzer: Sample description
	Formulation with multiplier		PGC: Additional information
	Formulation with target mass		PGC: Measurements chart
	Formulation using out of database ingredients		Working modes

	Formulation: Skip ingredient		Operator
	Accept		Left door opening/closing
	Abort		

44. APPENDIX D - ZEBRA Printer Settings

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

It is possible to generate printouts either manually or automatically.

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

Procedure for printing information printout and resetting printer parameters is to be found in ZEBRA printer manual.

45. APPENDIX E - Communication with Barcode Scanner

1. For communication with barcode scanners, RADWAG scales 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. Transmission parameters can be set for both weighing devices and scanners. 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

46. APPENDIX F – Menu Structure

User adjustment

Overview	**Value**
Internal adjustment	Function
External adjustment	Function
User adjustment	Function
Adjustment test	Function
Automatic adjustment time	1 - 12
Report printout	No / Yes
GLP Project. . →→	

Name	**Selection**
» Adjustment	No / Yes
» Working mode	No / Yes
» Date	No / Yes
» Time	No / Yes
» Operator	No / Yes
» Balance type	No / Yes
» Balance S/N	No / Yes
» Level status	No / Yes
» Nominal mass	No / Yes
» Difference	No / Yes
» Temperature	No / Yes
» Current mass	No / Yes
» Empty line	No / Yes
» Dashes	No / Yes

	» Signature	No / Yes
	» Non-standard printout	No / Yes
Adjustment history	Displays a report on completed external adjustments	

Databases

- Products
- Weighing records
- Customers
- Formulations
- Formulations reports
- Density reports
- Pre-packaged goods controls
- Average tares
- Pipettes
- Pipette calibration reports
- Series
- Ambient conditions
- Packages
- Warehouses
- Printouts
- Universal variables
- Delete data older than
- Export weighing database to a file

Communication

Overview		Value
COM 1		-
	» Baud rate	9600
	» Data bits	8
	» Stop bits	1
	» Parity	None
COM 2		-
	» Baud rate	9600
	» Data bits	8
	» Stop bits	1
	» Parity	None
Ethernet		-
	» DHCP	No
	» IP address	192.168.0.2
	» Subnet mask	255.255.255.0

	» Default gateway	192.168.0.1
TCP		-
	Port	4001

Peripheral devices

Overview		Value
Computer		-
	» Port	COM 1
	» Address	1
	» Continuous transmission	No / Yes
	» Printout template	Option
	» E2R System	Option
Printer		
	» Port	COM 2
	» Code page	1250
	» Printouts	Option
Barcode Scanner		
	» Port	None / COM 1/ COM 2
	» Offset	0
	» Code length	0
Transponder card scanner		
	Port	None / COM 1/ COM 2
Additional display		
	Port	None / COM 1-2 / Tcp
	Project	Option
Ambient conditions module		
	Port	None / COM 1-2 / Com internal
	Address	3

Inputs / outputs

Overview		Value
Inputs		
	» Input 1	Option
	» Input 2	Option
	» Input 3	Option
	» Input 4	Option

Outputs		
	» Output 1	Option
	» Output 2	Option
	» Output 3	Option
	» Output 4	Option

Permissions

Overview		Value
Anonymous operator		
	» Guest	Option
	» Operator	Option
	» Advanced operator	Option
	» Administrator	Option
Date and time		
	» Guest	Option
	» Operator	Option
	» Advanced operator	Option
	» Administrator	Option
Printouts		
	» Guest	Option
	» Operator	Option
	» Advanced operator	Option
	» Administrator	Option
Databases		
	Products	Options: - Guest - Operator - Advanced operator - Administrator
	Customers	
	Formulations	
	Packages	
	Warehouses	
	Printouts	
	Delete data older than	

Miscellaneous

Overview	Value
Language	Option
Date and time	Option

Beep	Option
Touch panel calibration	Function
Level control	Option
Autotest	Option

RADWAG BALANCES AND SCALES
ADVANCED WEIGHING TECHNOLOGIES