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User manual

IMMU-131-01-04-25-EN

Weighing Modules

MAS.M
MPS.M
MPS.T

Thank you for choosing and purchasing the RADWAG balance.
The balance has been designed and manufactured to serve you for many years.
Please read this Manual to assure its reliable operation.

MAY 2025

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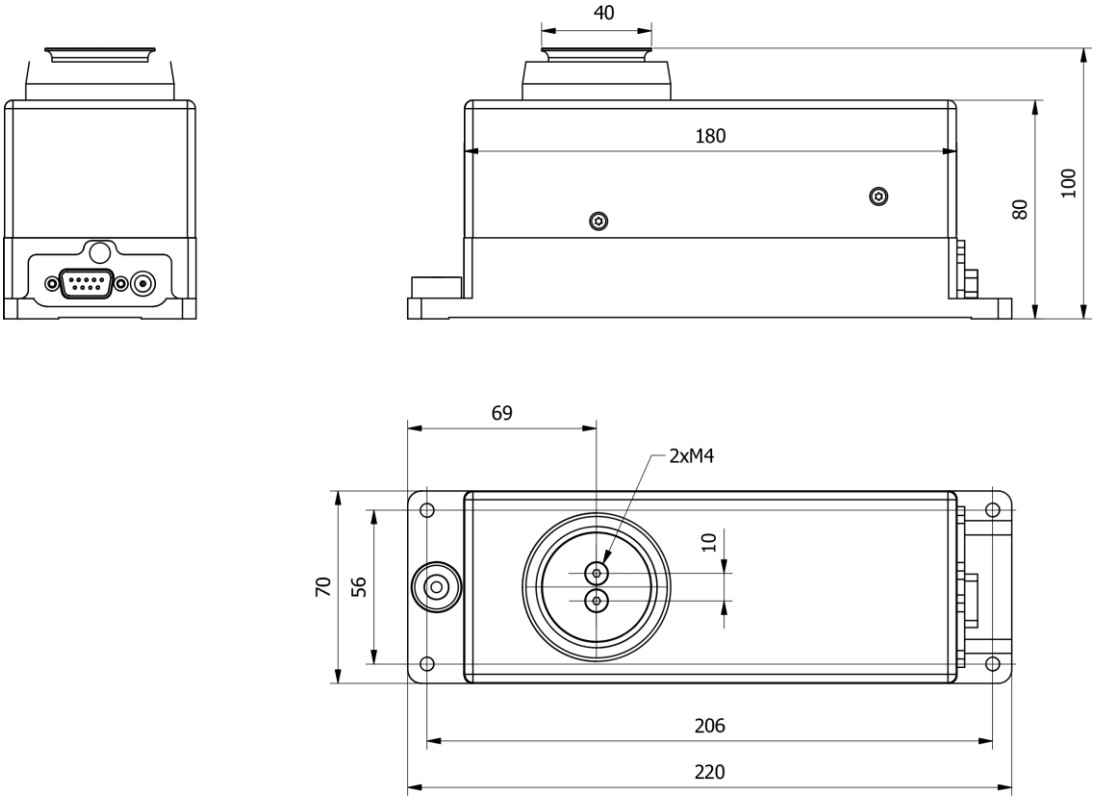
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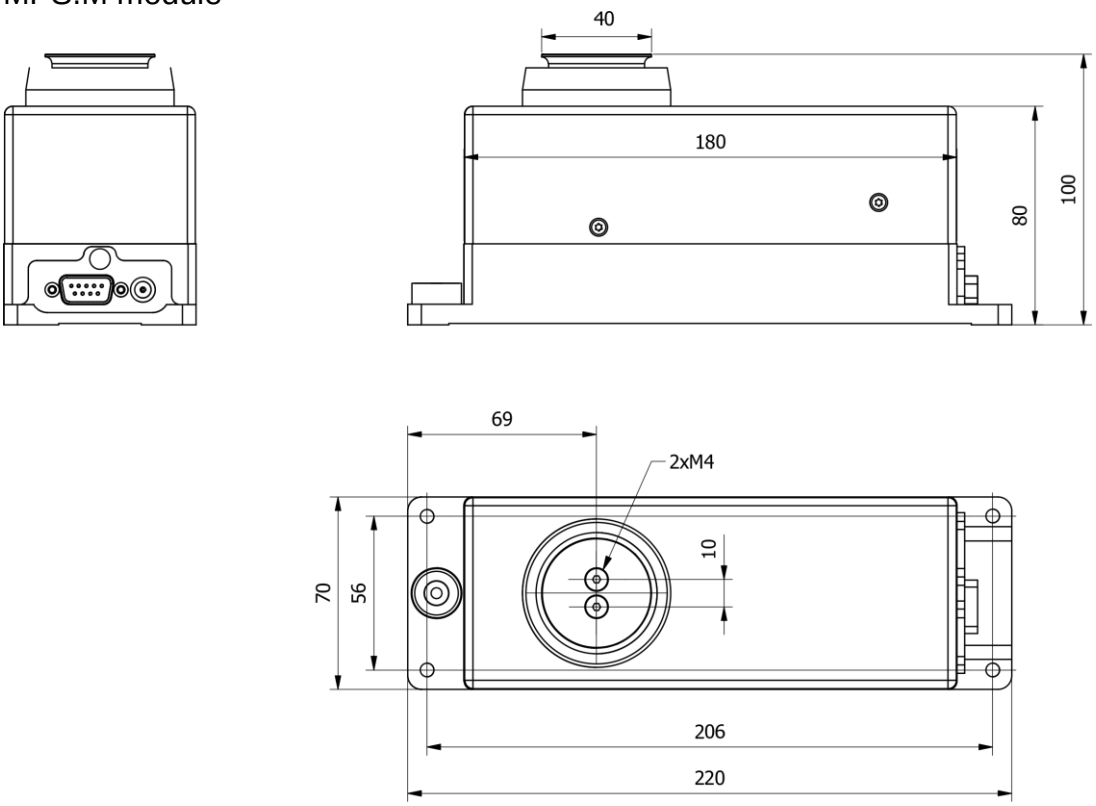
1. BASIC INFORMATION

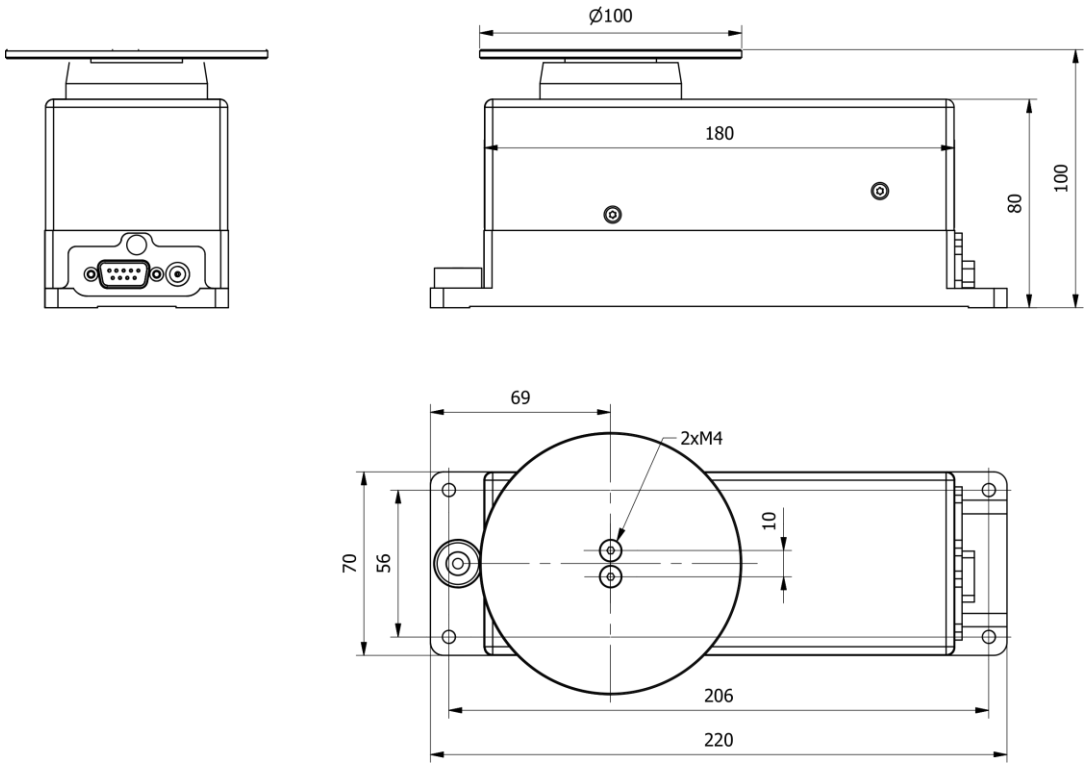
1.1. Overall dimensions

MAS.M module

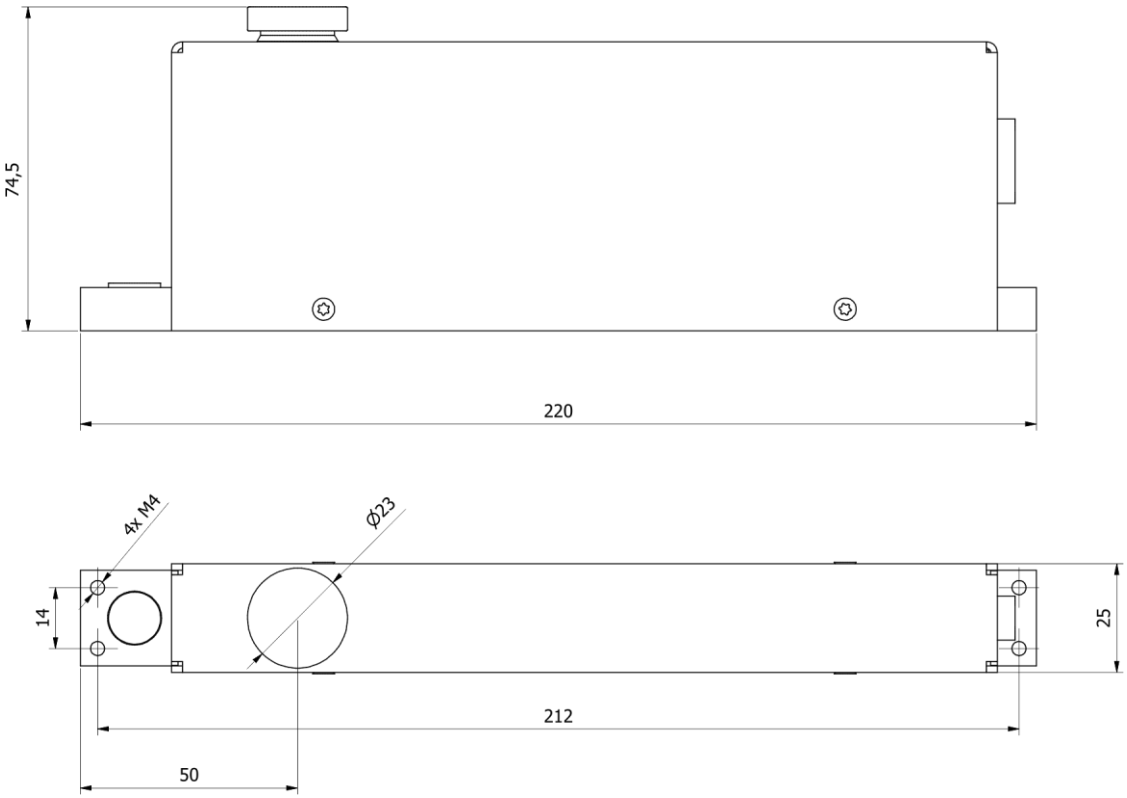


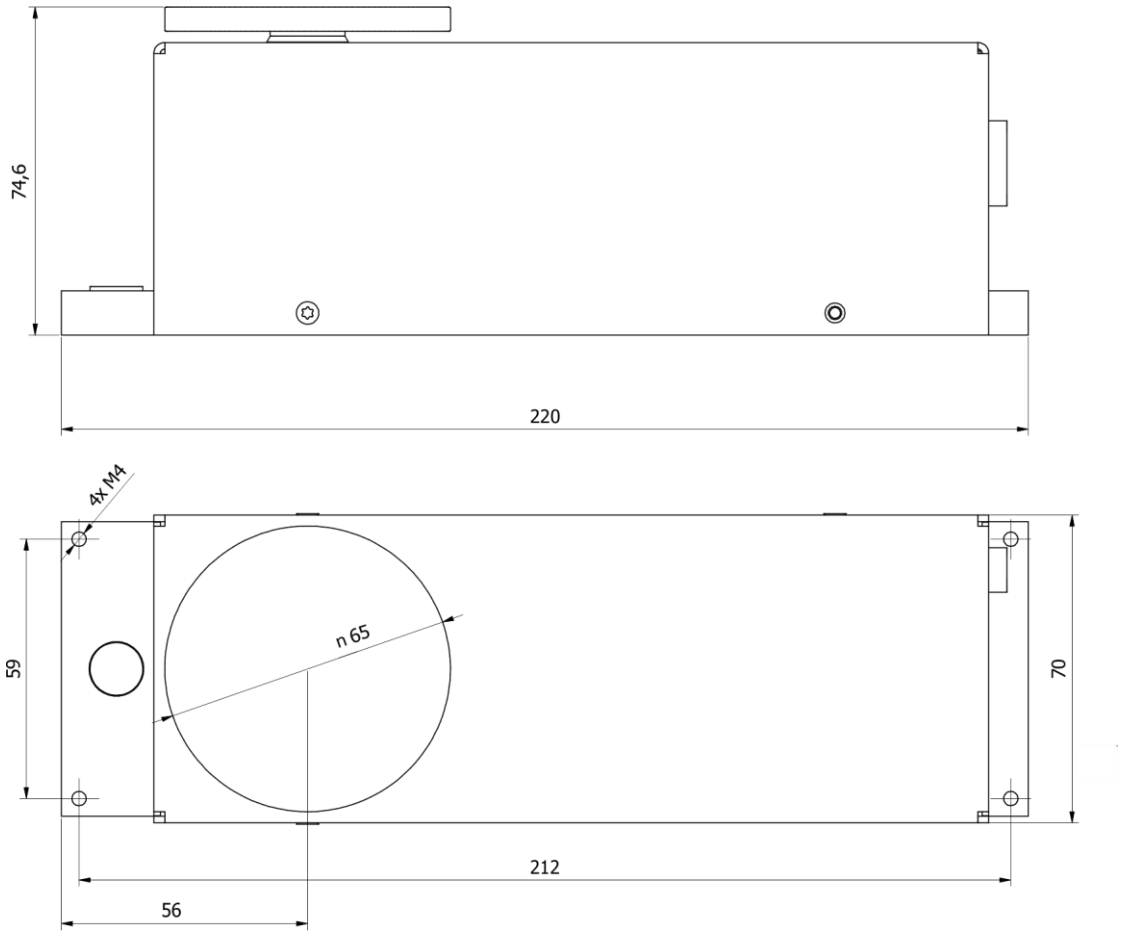
MPS.M module



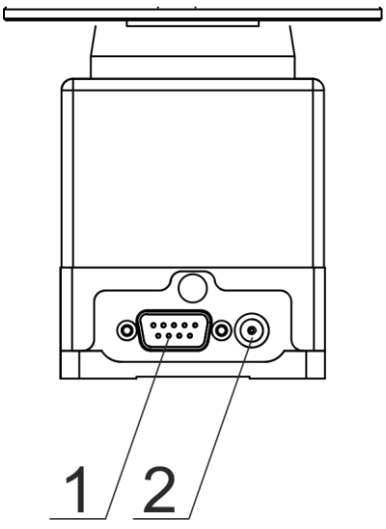

Ø100
180
80
100
69
2xM4
70
56
10
206
220

MPS.T module


74,5
220
4x M4
Ø23
14
25
212
50



Connection ports



1 - COM 1 port (e.g. computer)

2 - power port

2. BASIC INFORMATION

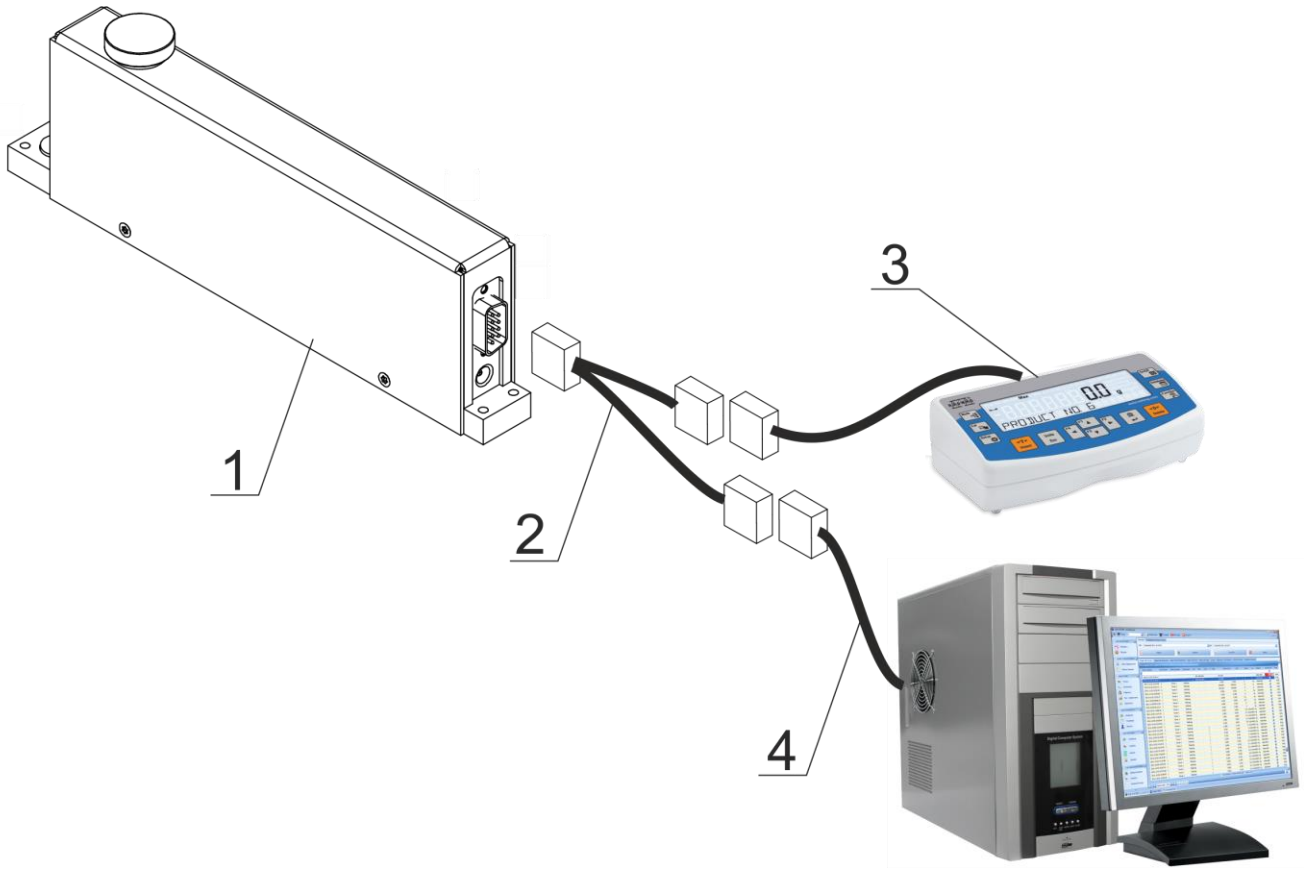
2.1. Intended use

The operation of the weighing module is based on a magnetoelectric force transducer or strain beam. The device is intended to be integrated into processing lines or laboratory equipment requiring mass measurement with an accuracy of at least 0.1 mg. It is possible to communicate with the module directly through a RS 232 interface or using an optional operator panel.
Measurements can be performed on the weighing pan.
The module may be equipped with an internal adjustment system triggered by temperature changes and definable interval. It is also supplied with a RS 232 communication interface.

2.2. Connection

To control its operation, the module can be connected to a personal computer [PC] (with a dedicated RPANEL software) or PLC controller (via ASCII communication protocol, RADWAG CBCP-07), via the RS232 interface, and/or to the R-type operator panel.

1. Weighing module
2. RS232 T-splitter cable (module-display)
3. R-type operator panel
4. RS cable (balance-computer)



2.3. Operating conditions

You can use other weighing pan than the standard one by adapting it to the fixing system adopted in the specific module.

In view of high measuring accuracy, it is advisable to integrate the module into the customer's device (e.g. in the draft cabinet) in order to limit the impact of ambient conditions on the weighing result.
The module cannot be used for dynamic weighing. If any minor items are added to or removed from the weighed material, the weighing result must be read only after the stability marker has been displayed. Do not place magnetic items on the weighing pan as it may lead to damage to the measuring unit.
Avoid dynamic loading of the weighing pan and overloading of the balance with the mass that exceeds the maximum lifting capacity limit. Please remember to consider (remove from the module lifting capacity) the tare mass (e.g. a container on the weighing pan). It is forbidden to use the module in the ex zone as the product is not designed to operate in hazardous areas.

2.4. Warranty

The device is covered by the comprehensive manufacturer's warranty that excludes the following:

- use at variance with guidelines specified in the operator's manual,
- use at variance with intended use,
- own alterations and modifications of the balance,
- unauthorised opening of the housing,
- mechanical damage and other damage caused by utilities, liquids, water and natural wear,
- unsuitable adaptation or defects of the electric system,
- measuring mechanism overloading.

2.5. Metrological parameters supervision

Metrological parameters of the balance must be checked by the operator at specific predefined time intervals. The aforesaid frequency depends on ambient conditions in which the balance is operating in, types of weighing procedures as well as quality supervision system in use.

2.6. Operator's manual

Please read the manual carefully before you activate and start the balance, even if you are experienced in working with such equipment. The manual contains all information required for suitable use of the device; adherence to the guidelines guarantees correct and reliable operation of the balance.

2.7. Staff training

The balance must be operated and supervised only by people that have been properly trained and are experienced in using it.

3. TRANSPORT AND STORAGE

3.1. Delivery check

Check the packaging and device upon delivery and inspect for outer signs of damage. If any damage is found, contact the manufacturer's representative.

3.2. Packaging

Please keep all parts of the packaging to use them for potential shipping in the future. Only the original packaging of the balance can be used for shipping. Before you pack the product, unplug all cables and remove all moving components (i.e. weighing pan, covers, inserts). Put elements of the balance in the original box and secure them against transportation damage.

4. UNPACKING, INSTALLATION AND INSPECTION

4.1. Place of installation, place of use

* the air temperature in the room must range from +10 °C to +40 °C,
* relative humidity must not exceed 80%,
* while using, room temperature fluctuations must be very slow,
* pay special attention to magnetic material weighing as a strong magnet is part of the module,
* if static electricity has influence on module indications, please ground its base.

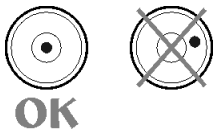
4.2. Unpacking

Slash the protective tape. Remove the module from the factory box. Remove all parts of the device from the accessories box.

4.3. List of standard delivery items

- Module with weighing pan
- Power cable

4.4. Settings



Before you supply power, level the module by adjusting its legs so that the air bubble in the level is in the central position.

The balance must stand firmly on the floor, resting on all its legs.

4.5. Cleaning

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

1. Disassemble the weighing pan and other moving parts of the balance; depending on the type of balance (see description in: UNPACKING AND ASSEMBLY). Take all steps carefully in order not to damage the mechanism.

Note:
Cleaning the weighing pan while it is being installed may lead to damage to the balance.

Cleaning ABS elements:

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

Cleaning glass elements:

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

Cleaning stainless steel elements:

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

Fingerprints	Wash with spirit or solvent. Rinse with pure water and wipe it dry.
Oils, fats, greases	Wash with organic solvents and then warm water with soap or soft detergent. Rinse with pure water and wipe it dry.
Stains and blooms	Wash with a soft scrubbing detergent. Clean gently as per surface structure direction. Wash with pure water and wipe it dry.
Strong discolouration	Clean with a detergent as per cleaning direction. The following cleaning materials will prove perfect: brushes with natural hair and synthetic hair, brushes with microfibres, chemical and natural fibres, plastic cloths, spongy cloths, sponges.

	Rinse with pure water and wipe it dry.
Traces of rust	Moisten with oxalic acid solution and leave for about 15-20 minutes. Then wash with warm water and soap or soft detergent. Rinse with pure water and wipe it dry.
Paints	Wash with paint solvent, and then wash with warm water and soap or soft detergent. Rinse with pure water and wipe it dry.
Scratched surface	Gently polish with unwoven fabric (iron-free) as per surface structure direction, and then wash with a soft scouring detergent. Rinse with pure water and wipe it dry.

Cleaning powder-painted elements:

The first step is preliminary cleaning under running water or with a large-pore sponge and a large amount of water in order to remove loose and major dirt. Do not use abrasive agents. Next, using a suitable cloth and water-cleaning agent solution (e.g. soap, dishwashing liquid), clean the surface by applying a regular pressure of the cloth against the surface of elements. Do not use only a detergent to clean it dry as it may damage the coating. Use a large amount of water, or water together with a cleaning agent.

Cleaning aluminium elements

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

4.6. Mains supply connection

The module can be connected to the mains only using the original power cord (supplied). The power cord rated voltage (specified on its rating plate) must comply with the rated voltage of the mains.
To supply power, insert a power plug into the mains socket and then insert the power connector into the port located on the side of the housing.
Once the power has been supplied, the program launching procedure will be initiated. During the module activation procedure, the internal adjustment mechanism is also tested (the internal adjustment mass is positioned and lifted once).

4.7. Connection of additional equipment

Before you connect or change any additional equipment (e.g. personal computer), you are strictly required to disconnect the module from the source of power.
Only the additional equipment that has been recommended by the manufacturer may be connected.
Once you have connected the devices, supply power to the module.

5. INITIATION OF WORK

In its basic variant, the module is devoid of a display unit while the weighed load mass is directly sent to the computer connected to the module via the RS232 port. To configure the module, use the operator panel that must be connected to the DB9-type port located in the module housing (see figure below).

When connected, the device has all the functions of the standard R-series balance. For this reason the functions and method of setting them are described in further sections of the manual.

After connecting to the mains, the program name and number will be displayed and the weighing function will be activated.

5.1. Temperature stabilisation time

Before you start measurements, wait for the module to stabilise thermally. With regard to modules that had been stored at a way lower temperature (e.g. in winter) before being connected to the mains, the acclimatisation and warming time ranges from 4 hours for MPS variants, to 8 hours for MAS modules. It is advisable to make sure potential ambient temperature fluctuations in the place of using the device are gradual and very slow.

6. INTEGRATION WITH SUCH PERIPHERALS AS PRINTER OR COMPUTER

Note:

A peripheral that is connected to the RS 232 or USB port must be supplied with power from the common low-voltage mains with shared electric shock protection in the way that prevents emergence of potentials difference between the neutral lines of the balance and connected device.

Transmission parameters programmed in the balance must comply with the ones of the device connected.

- Baud rate - 2400 ÷ 115200 bit/s.
- Parity check - NONE, ODD, EVEN.

The value showed in the display unit can be sent via the RS232 port, USB to a peripheral in one of the following ways:

- Manually – when key is pressed.
- Automatically – when value has stabilised.
- Continuously – when function is enabled or control command has been sent.
- Upon request from the peripheral (see additional functions).

The value showed in the display unit may be sent via the COM or USB port as one of the following values:

- stable **–** when weighing result has stabilised, the information will be sent,
- unstable – displayed status is sent to the peripheral when the command is given (the status is marked with <?> in the printout, before the weighing result).

6.1. Data format

To send the weighing result from the balance to the peripheral, press key in the balance or send the control command from the computer.

6.2. Data format after pressing PRINT key

Note: *For a verified balance, the temporary measurement printout is blocked.*

Printout format for non-verified balances

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

stability mark - [space] – if stable
- [?] – if unstable
- [^] - if upper range limit is exceeded
- [v] - if lower range limit is exceeded

mark - [space] – for positive values or [-] for negative values

mass - 9 marks – right alignment

unit - 3 marks - left alignment.

Printout format for verified balances

1	2	3	4 - 14	15	16 - 18	19	20
stability mark	space	mark	mass	space	unit	CR	LF

stability mark - [space] – if stable
- [?] – if unstable
- [^] - if upper range limit is exceeded
- [v] - if lower range limit is exceeded

mark - [space] – for positive values or [-] for negative values
mass - 11 marks – right alignment (includes digit markers)
unit - 3 marks - left alignment.

6.2.1. Data format for computer-generated commands

Upon receiving the command, the balance initially responds with:

XX_A CR LF – command understood, execution initiated,
XX_I CR LF – command understood but currently unavailable,
XX_^ CR LF – command understood but upper range limit exceeded,
XX_v CR LF – command understood but lower range limit exceeded,
XX_E CR LF – command execution error occurred – timeout while awaiting stable result (time limit is the distinctive feature of the balance),
XX – command name.
and then:

1 – 3	4	5	6	7	8 – 16	17	18 - 20	21	22
command	space	stability mark	space	mark	mass	space	unit	CR	LF

command - 1 ÷ 3 - marks
stability mark - [space] – if stable
- [?] – if unstable
- [^] - if upper range limit is exceeded
- [v] - if lower range limit is exceeded

mark - [space] – for positive values or [-] for negative values
mass - 9 marks – right alignment
unit - 3 marks - left alignment.

7. COMMUNICATION PROTOCOL

Basic information

- The mark-based communication protocol between the balance and terminal is intended for communication between the RADWAG balance and a peripheral via the serial link.

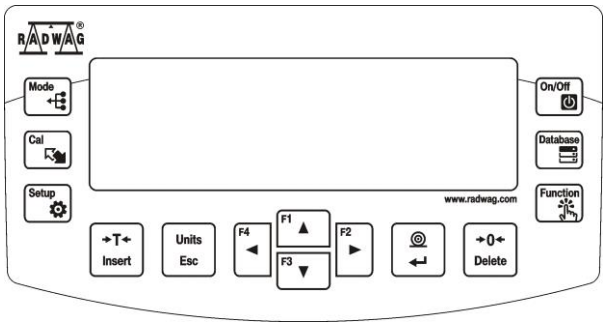
- The protocol is composed of commands sent from the peripheral to the balance and responses from the balance to the device.

- The responses are sent from the balance every time the command is received, as a reaction to the specific command.

- Using commands that form the communication protocol, you can obtain information on the balance status and method of influencing its operation. For example you can receive weighing results from the balance, zero, etc.

	***For detailed description of the communication protocol between the balance and computer, please see „CBCP-07" in the manual.***

8. OPERATOR PANEL KEYPAD



On/Off	***ON/OFF*** *key used to activate/deactivate the module display unit. After deactivating the display unit, other components are still powered, and the module remains in a standby mode.*
Database	This key allows you to directly select data saved in such databases as user, product, tare.
Function	This functional key allows you to quickly enter functions dedicated to a specific working mode.
Mode	**MODE** key for selection of a working mode.
Units Esc	**UNITS** key for changing weighing units.
	PRINT/ENTER key for sending the displayed message to a peripheral (PRINT) or for approving the specific parameter or function value (ENTER).
→0← Delete	**ZERO** key for zeroing of module indication.
→T← Insert	**TARE** for tarring of module indication.
Cal	This key is used to directly initiate the module adjustment/calibration procedure.
Setup	The key used to enter the main menu.
F4 F1 F2 F3	Directional keys allow you to navigate in the menu or change parameter set values.

NOTE:
To activate specific operations in the program, press a relevant key in the operator panel (as described in this manual) or send a relevant command from the computer.

!	***For detailed description of the communication protocol between the balance and computer, please see „CBCP-07”.***

8.1. User menu

The menu is divided into 9 basic function groups. Each group is assigned a unique symbol, starting with a capital P.

P1 CALIBRATION

P1.1 INT. CAL. | [internal calibration]
P1.2 EXT. CAL. | [external calibration]
P1.3 USE. CAL. | [user calibration]
P1.4 CAL. TEST | [calibration test]
P1.5 AUTO. CALIBR. | [automatic calibration]
P1.6 AUTO CAL. C. | [aut. calibration time]

P2 WORKING MODES

P2.2 WEIGHING | [weighing function settings]

P3 COMMUNICATION

P3.1 COM 1 | [COM 1 port transmission parameters]

P4 PERIPHERALS

P4.1 COMPUTER | [computer integration settings]

P5 PRINTOUTS

P5.1 CAL. REPORT | [balance calibration report content]
P5.2 HEADER | [header printout content]
P5.3 GLP PRINTOUT | [footer printout content]
P5.4 FOOTER | [weighing result printout content]
P5.5 NSTD. P. 1 | [non-standard printout template, no. 1]
P5.6 NSTD. P. 2 | [non-standard printout template, no. 2]
P5.7 NSTD. P. 3 | [non-standard printout template, no. 3]
P5.8 NSTD. P. 4 | [non-standard printout template, no. 4]
P5.9 VARIABLE 1 | [variable 1 template]
P5.10 VARIABLE 2 | [variable 2 template]

P6 MISCELLANEOUS

P6.1 LANGUAGE | [menu language]
P6.2 PERMISS. | [permission level for menu edition]
P6.3 KEY SOU. | [key sound]
P6.4 ILLUM. | [display illumination level]
P6.5 OFF | [illumination shutdown time]
P6.6 AUTO OFF | [display shutdown time]
P6.7 DATE | [date setting]
P6.8 TIME | [time setting]
P6.9 DATE FORM. | [date format]
P6.10 TIME FORM. | [time format]
P6.11 AUTOTEST GLP| [balance autotest]

P7 INFO

P7.1 BALANCE ID | [balance ID]
P7.2 BALANCE TYPE | [balance type]
P7.3 SOFT. VER. | [software version]
P7.4 TEMPERATURE | [temperature]
P7.5 BAL SETT. | [balance parameters printout]

P8 UNITS

P8.1 AVAILAB. | [declaration of particular units]
P8.2 START UNIT | [selection of unit for balance startup]
P8.3 UNI. U1 | [definition of first custom unit]
P8.3 UNI. U2 | [definition of second custom unit]



Note:
The changes entered into the memory will be saved permanently, also after you leave the menu (return to the weighing function). To leave the menu, press the ***Esc*** *key a few times.*

8.2. Logging

To gain full access to user parameters and edit databases, the balance operator must log in as <**ADMINISTRATOR>** every time the device is activated.
The program allows you to enter 100 users with various permission levels.

First login:

- While in the home screen, select <**LOG IN>** item available after taking one of the following actions:
  - press 

key,
  - press one of the functional keys that has been assigned **<LOG IN>** shortcut,
  - press 

key,

  next enter the operator base and select <**ADMIN>** user.
- After selecting **< ADMIN>** user and confirming it via  key, the operator password field will be displayed.
- Enter **„1111”** password and press  key to confirm.
- The home screen will be restored.
- After you have logged in for the first time, at first enter users and assign them relevant permission levels (as described in further sections of the manual, see section 12.1).

  While you are logging in again, select the user from the list and enter the password to start working with specific permission level. If a user is logged in, the following pictogram is displayed: .

Logout:

- To log out, select <**NONE>** item from the list of available users.
- The home screen will be restored and absence of the logged user will be communicated (no  pictogram in the screen).

8.3. Units

P8 UNITS parameters group allows you to change availability of mass units while working with the balance as well as define two custom units. The possibility of making these changes significantly improves comfort and working efficiency. It is possible to change the unit into other than [g] in the weighing mode.

8.4. Selection of temporary mass unit

This function allows you to select a weighing unit to be displayed for the mass while working. The unit will apply from the change of unit until deactivation of the balance or rechange of the weighing unit. Press [Units Esc] key to change the unit of measure.

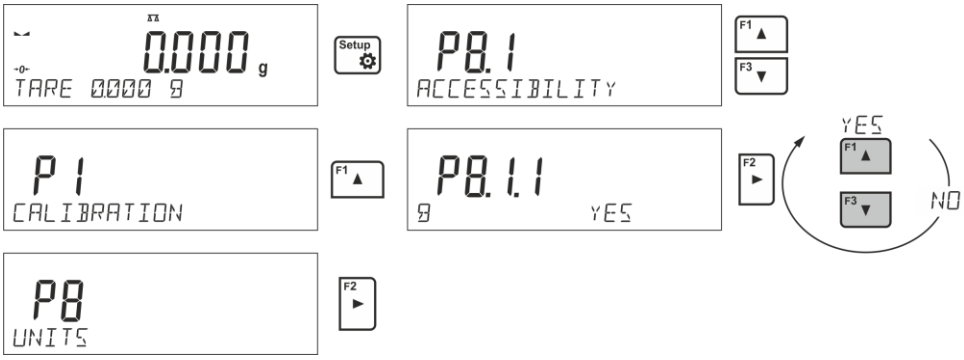
Options:

- For non-verified balances – the following units may be selected: [g], [mg], [kg], [ct], [lb], [oz], [ozt], [dwt], [tlh], [tls], [tlt], [tlc], [mom], [gr], [ti], [N].

8.5. Availability of weighing units

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

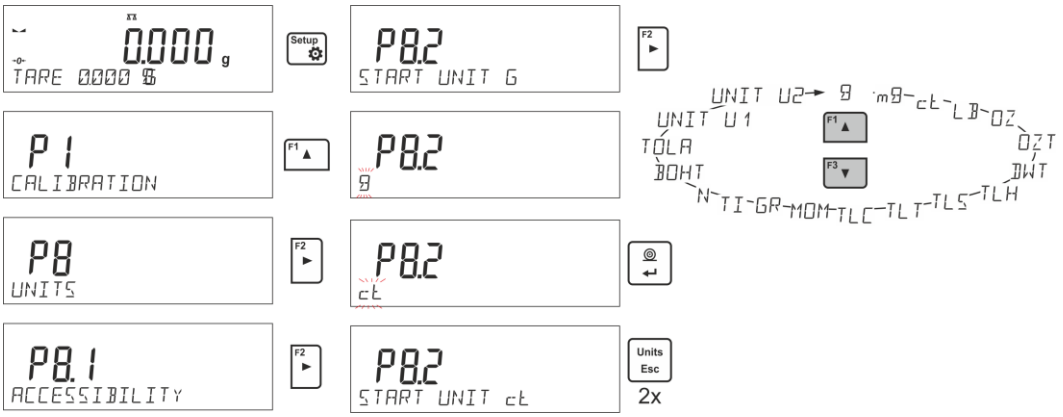
Procedure:



8.6. Selection of start-up weighing unit

After selecting the start-up unit, the activated balance will enable the unit selected as start-up (in which it is possible to change units).

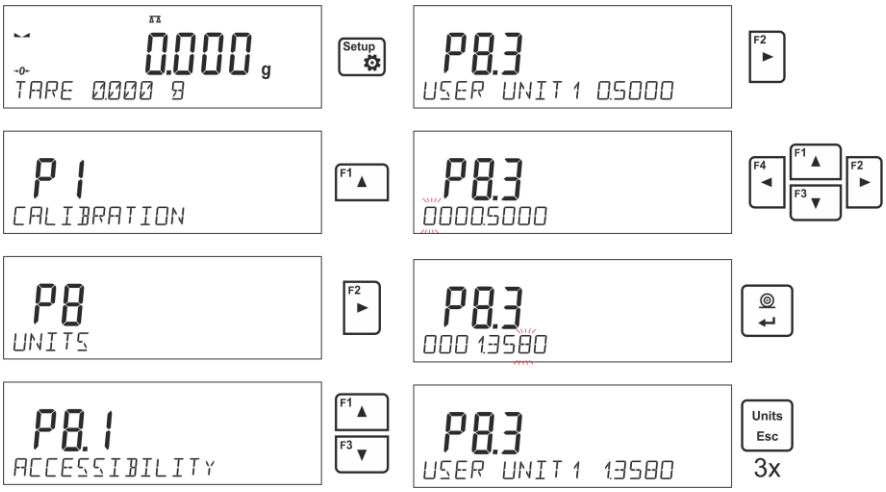
Procedure:



8.7. Custom unit

You can declare two custom units. The custom unit arises from multiplication of the indication (value) by the factor entered for the specific custom unit.
In the screen, custom units are marked as **[u1]** – custom unit 1 and **[u2]** – custom unit 2.

The method of declaring the factor for the custom unit is showed below:



Custom units are available only with regard to non-verified balances.

9. OTHER PARAMETERS

You may change parameters to influence the operation of the balance. These parameters can be accessed in the **P6 MISCELLANEOUS** group.
To change settings of particular parameters, just follow steps described in the previous section of the manual.

Menu language
This parameter allows you to choose menu descriptions.
Available languages: POLISH, ENGLISH, GERMAN, SPANISH, FRENCH, TURKISH, CZECH, ITALIAN, HUNGARIAN.

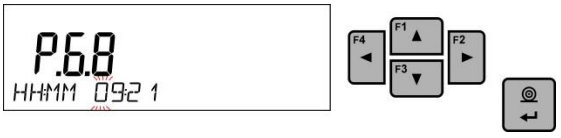
Permission levels
This parameter allows you to select the permission level for the unlogged operator who wants to enter the menu.
Available permission levels: ADMIN/USER/ADVANCED
Depending on the variant you choose, you do not need to be logged in to be allowed to make changes to settings in the menu; to the extent permitted for the specific permission level (see description of permission in section 12.1 of the manual).

„Beep" sound – reaction to pressed button
This parameter allows you to activate/deactivate sound signals informing you that any key on the facade of the device has been pressed.
NO - signal is inactive.
YES - signal is active.

Date
This parameter allows you to set a current date.
How to set:



Time
This parameter allows you to set current time.
How to set:



Date format
This parameter allows you to select a date format in the printout:
[YYYY.MM.DD / YYYY.DD.MM / DD.MM.YYYY / MM.DD.YYYY].

Where: YYYY – year; MM – month; DD – day.

Time format
This parameter allows you to select the time format in the printout: [12H / 24H].
For [**12H**] value, in **<P6.6 TIME>** parameter, the <A> or <P> letter will be displayed next to the time displayed.

Where: **A** represents time before noon, and **P** – stands for time after noon. There are AM or PM letters next to the time in the printout.

Autotest GLP

<AUTOTEST> function has been created to help the operator both in assessment of work and diagnosing of causes of weighing errors that exceed permissible values for a specific type of balance.

AUTOTEST easily allows you to regularly optimise balance settings in order to obtain the best repeatability and weighing time parameters in the specific working environment. Thanks to this function, you can also check the aforesaid parameters at any time, as well as archive test in the form of test report printouts that are generated instantly when the checking procedure is finished. GLP autotest is based on indication repeatability test while the internal weight is placed and on determination of the balance indication error with reference to its maximum lifting capacity.

To perform the Autotest, take the following actions:

- position the internal weight twice, and then position this weight 10 times and calculate the standard deviation for 10 measurements,
- calibrate the balance,
- print the report out.

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

Example of report:

.....
--------- Autotest GLP: Report ---------
Balance type xxx.R2
Balance ID 400010
Operator Admin
Application version v.x.x.x
Date 2013.07.16
Time 09:17:16

No. of measurements 10
Reading unit 0.001/0.01 g
Internal weight mass 1402.094 g
Filter Medium
Result approval Fast and precise

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

Procedure:

Activate <P6.11 AUTOTEST GLP> parameter using F2 ► key. The program will initiate the GLP autotest procedure and it will be performed automatically. You can abort the procedure at any time by pressing Units Esc key in the box.

When the procedure is over, the standard deviation result for all measurements will be displayed in the home screen. <RESULT> inscription will show up in the lower row and the final report will be printed out instantly (see the example of report above). The report can be reprinted by pressing ◎ ↵ key. The report is not saved and will be deleted from the volatile memory once you have left this level. To leave the box, press Units Esc key and you will return to the menu.

10. ADJUSTMENT

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

The adjustment must be performed:

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

Types of adjustment:

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

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

10.1. Internal adjustment

It is possible to initiate the adjustment procedure automatically or manually.

As part of the manual initiation, press Cal key. Next the automatic adjustment system will perform the adjustment instantly, informing you about subsequent steps.

Course of automatic adjustment:

- The program identifies a need to perform adjustment and communicates it via a thermometer or clock pictogram and <Cal> inscription at the top of the screen: 

; from now on the time of 2 minutes is counted down; at this time further weighing cycles can be performed.
- When the period has expired, the following message is displayed: <**CAL_30>** and countdown starts, from 30..29..28 to 0 (the value showed is the time marker).
- To complete the adjustment, no actions must be taken.
- To finish measurements, press <**Esc>** key**.** After you have pressed the key, the weighing mode is restored and the previous weighing result is showed. After about 5 minutes, the following message is displayed again: <**CAL 30>.**
- You can reschedule the adjustment procedure many times but you must remember that long-lasting postponement may lead to increased weighing errors. These errors result from temperature fluctuations and consequently changes to balance sensitivity.

Automatic adjustment is performed in 3 cases:

- Adjustment after connecting to the mains – verified balances.
- Adjustment with special regard to temperature fluctuations inside the balance. The balance is equipped with a precise temperature fluctuation monitor system. The adjustment temperature is recorded. Another is initiated when the temperature taken by the balance changes by more than 1°C or 2°C (MAS, MPS balances).
- Adjustment with elapsed time. You can declare time intervals which will be considered for adjustment performance (available only to non-verified balances).

10.2. Adjustment menu

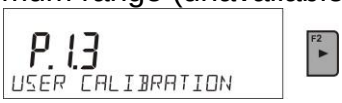
- **P1.1 INT. CAL.** – **Internal adjustment**
  Initiation of the internal adjustment. This procedure is fully automatic, without the operator's intervention. If the weighing pan is loaded, the message about a need to unload the weighing pan will be displayed. If the weight on the weighing pan is minor (up to ±10% of the max. range), the balance will adjust instantly, with no need to unload the weighing pan.



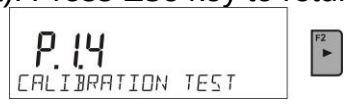
- **P1.2 EXT. CAL.** – **External adjustment (with external weight)**
  The adjustment with an external weight whose value is saved in the factory menu (unavailable to verified balances).



- **P1.3 CUST. CAL.** – **Custom adjustment (with external weight)**
  The adjustment with an external weight of any mass falling within the permitted range, yet not lower than 30% of its maximum range (unavailable to verified balances).



- **P1.4 CAL. TEST** – **Adjustment test**
  It is concerned with comparing an internal adjustment mass with its value saved in the memory. This procedure is automatic, and the result is showed in the screen (if the balance is connected via one of the communication ports to the computer or printer, the adjustment test will be printed out). Press **Esc** key to return to the previous window.



- **P1.5 AUTO. CAL. TEMP.** – **Automatic adjustment**
  Here you need to specify the factor that is to determine the initiation of automatic internal adjustment (unavailable to verified balances).
  NONE - none of factors will trigger initiation of adjustment (automatic adjustment disabled).
  TEMP - adjustment with regard to temperature fluctuations inside the balance.
  TIME - adjustment with regard to time set in **P1.6 AUTO CAL. C.**
  BOTH - adjustment with regard to time and temperature fluctuations.

- **P1.6 AUTO CAL. C. - Automatic adjustment time**
  Here you need to specify period of time after which the automatic adjustment is to start (unavailable to verified balances).

10.3. Manual adjustment

10.3.1. Internal adjustment

The internal adjustment is performed automatically. While it is going on, do not load the weighing pan. <**DO NOT DEACTIVATE ADJUSTMENT>** message is displayed in the lower row of the screen. When it is over, the adjustment results are saved in the memory and the weighing mode is restored.

***Note*:**

*- If it is necessary to abort the adjustment procedure, press **Esc** key.*

- If the weighing pan is loaded while the adjustment procedure is going on, the error message will be displayed. The adjustment will be aborted and the weighing mode will be restored. After unloading, the adjustment procedure may be restarted.

10.3.2. External adjustment

The external adjustment must be performed using an external weight (E_2 class for MAS balances or F_1 class for MPS balances) (unavailable to verified balances).

Procedure:

- Start the external adjustment procedure, you will see the message about unloading the weighing pan: <**REMOVE MASS>** (weighing pan must be empty). After unloading the weighing pan, press key.
- The mass of the empty weighing pan will be determined and the **<ADJUSTMENT>** message will be displayed in the lower row of the screen. Next you will see <**PUT MASS>** message in the lower row, and in the main box – mass value to be placed on the weighing pan, e.g. **200.000g** (depending on the type of balance).
- Put the weighing of a specific mass and press key**.** The mass will be determined and the following message will be displayed in the lower row: **<ADJUSTMENT>.** When the adjustment procedure is finished, you will return to <**P1.2 EXT. CAL.>** submenu.

10.3.3. Custom adjustment

The external adjustment must be performed using an external weight (E_2 class for MAS balances or F_1 class for PS balances) (unavailable to verified balances).

Procedure:

- Declare the weighing mass to be used for adjustment. Its mass must be ≥ 30% of the maximum lifting capacity limit.
- Once you have entered and approved the weight mass, the message on removing the weighing pan will be displayed: <**REMOVE MASS>** (weighing pan must be empty). After unloading the weighing pan, press key.
- The empty weighing pan mass will be determined and the <**ADJUSTMENT>** message will be displayed in the lower row of the screen. Next <**PUT MASS>** message will be showed in the lower row while in the main screen – mass value to be put on the weighing pan, e.g**. 200.000g** (depending on the type of balance).

- Next put the weighing of a specific mass and press  key. The mass will be determined and **<ADJUSTMENT>** message will be displayed in the lower row. When adjustment is over, you will return to **P1.2 EXT. CAL.** submenu**.**

10.4. Adjustment report printout

The adjustment report is generated automatically upon the end of the adjustment procedure or adjustment test, and sent to COM1 communication port. The content of the report is declared in P5.1 CAL. REPORT menu.
To see the method of declaring settings for this variant, please read the section dedicated to printouts in this manual.
The report can be printed using the connected printer or sent to the computer and saved as a file for archiving purposes.

11. PRINTOUT CONTENT SETTINGS

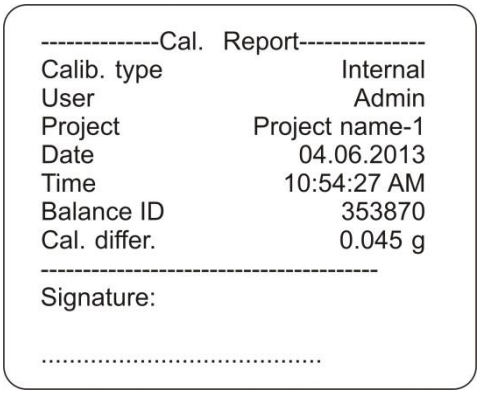
11.1. Adjustment report

P5.1 CAL. REPORT is a group of parameters allowing you to declare the data that are to be included in the adjustment report printout.

Variable name	*Description of variable*
PROJECT	This item allows you to enter the project name (e.g. associated with specific type of weighing). The name may be up to 16 characters long.
ADJ TYPE	This item allows you to print the type of adjustment.
USER	This item allows you to print the name of logged operator.
PROJECT	This item allows you to print the project name (see: Project parameter).
DATE	This item allows you to print the adjustment date.
TIME	This item allows you to print the adjustment time.
BALANCE S/N	This item allows you to print the balance serial number.
ADJUSTMENT RESULT DIFFERENCE	This item allows you to print the difference between masses of the adjustment weight weighed during last adjustment and mass of currently weighed weight.
DASHES	This item allows you to print dashes that separate the printout date from the signature field.
SIGNATURE	This item allows you to print the adjustment performer signature field.

For the parameters showed above, select either of the values:
NO – do not print in the report
YES – print in the report

Example of the report:



11.2. Other printouts

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

List of variables in printouts:

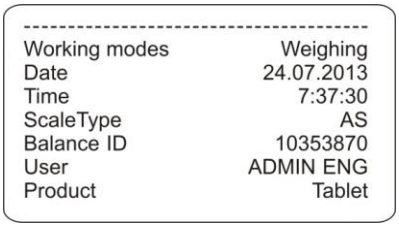
Variable name	*Variable description*	*Included in:*
WORKING MODE	This item allows you to print the working mode name.	Header Footer
BALANCE TYPE	This item allows you to print the balance type.	Header Footer
BALANCE S/N	This item allows you to print the balance serial number.	Header Footer
USER	This item allows you to print the name of logged operator.	Header GLP Printout Footer
PRODUCT	This item allows you to print the name of currently selected product.	Header GLP Printout Footer
DATE	This item allows you to print the printout date.	Header GLP Printout Footer
TIME	This item allows you to print the printout time.	Header GLP Printout Footer
VARIABLE 1	This item allows you to print the content of VARIABLE 1.	Header GLP Printout Footer
VARIABLE 2	This item allows you to print the content of VARIABLE 2.	Header GLP Printout Footer
NET	This item allows you to print the value of NET mass in the basic (adjustment) unit.	GLP Printout
TARE	This item allows you to print the tare value in the current unit.	GLP Printout
GROSS	This item allows you to print the gross value in the current unit.	GLP Printout
CURRENT RESULT	This item allows you to print the current result (NET mass) of the measurement in **current unit.**	GLP Printout
ADJUSTMENT REPORT	This item allows you to print the last adjustment report as per settings declared for the adjustment report printout (see section 14.1 of the manual).	Header GLP Printout Footer
DASHES	This item allows you to print dashes separating the printout data from the signature field.	Header Footer
EMPTY LINE	This item allows you to print the empty separating line.	Header Footer
SIGNATURE	This item allows you to print the adjustment performer signature field.	Footer
PROFILE	This item allows you to print the name of currently selected profile.	Header GLP Printout Footer
NON-STANDARD PRINTOUT	This item allows you to place one of 100 non-standard printouts in the printout. You can select one of the following: NONE/non-standard printout name. The method of including non-standard printouts can be accessed further in the manual.	Header GLP Printout Footer

For parameters showed above, select either of the following:

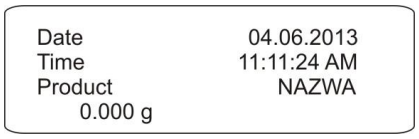
NO – do not print;

YES – print

Examples of printouts:



Header



GLP Printout



Footer

11.3. Non-standard printouts

The program allows you to enter 4 non-standard printouts. Each of them may be around 160 characters long.

The non-standard printout may contain the following:

- variable data, depending on the working mode and operator's other needs (e.g. mass, date, etc.),
- fixed texts, entered into the operator's menu; please remember to use only upper-case letters and not to use Polish characters,
- non-standard printout may contain up to 160 characters (in the form of one string of characters).

11.3.1. Text entry

Variable data, available in all modes and of the same values:

%%	„%" single mark printout
%V	Current net mass in current unit
%N	Current net mass in basic unit
%G	Current gross mass in basic unit
%T	Current tare mass in basic unit
%D	Current data
%M	Current time
%I	Balance ID
%R	Program ID
%P	Project ID
%U	User ID
%F	Name of current function – working mode
%C	Last adjustment date and time
%K	Type of last adjustment
%S	Currently selected (weighed) product
%Y	Deviation in last adjustment
%1	Variable 1
%2	Variable 2

Variable data, dependent upon currently used working mode:

Variable	*Description*	*Mode in which variable is active*
%W	1 piece standard mass	PART COUNTING
%H	Upper threshold	CHECKWEIGHING
%L	Lower threshold	
%A	Target mass	DOSING
%B	Reference mass	DEVIATIONS

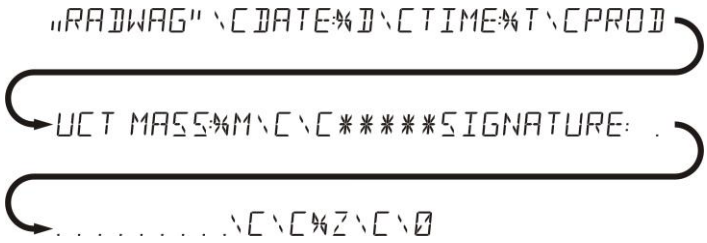
Special marks, used to design special printouts:

\\	„\" single mark
\C	CRLF
\R	CR
\N	LF
\T	Tabulator
\F	Page ejection (for PCL printers)
%E	Paper cut for EPSON printers

Every printout may contain up to 160 characters (letters, digits, special characters, spaces). You can use special characters to include variable data in your printouts, as per your needs.

Example 1:
„RADWAG"
DATE: <current measurement date>
TIME: <current measurement time>
PRODUCT MASS: <current mass value>

******SIGNATURE:.....*
<current working mode>
Enter printout content settings and design the printout using relevant variable data and text-formatting marks.



Example 2:
To cut paper off when the printout has been completed using the EPSON printer (if the printer is equipped with a cutter), enter a non-standard printout 1, 2, 3 or 4 for the specific printout (HEADER, GLP PRINTOUT or FOOTER). In the aforesaid printout, <**%E**> will be included, select this printout for printout settings.

In such a case, <SUFFIX> command must be empty.
Paper is to be cut after printing the FOOTER.

Examples of settings:

- P5.4.14 NSTD PRINT |P. NSTD. 1
- P5.5 P. NSTD. 1 |%E

How to enter texts:

- **using the operator panel keypad**

F2 ►	Select the mark to be changed. Move cursor or active (pulsating) mark to the right.
F4 ◄	Select the mark to be changed. Move cursor or active (pulsating) mark to the left.
F3 ▼	Decrease the value by one unit.
F1 ▲	Increase the value by one unit.
→0← Delete	Delete mark.
→T← Insert	Insert mark.

11.4. Variables

Variables are alphanumerical data that can be associated with printouts, product or other weighing-related information. Variables may be used to enter a series number or batch number while weighing products. The program allows entering 2 variables. Each of them may include up to 32 characters. While entering each variable, enter its content. To enter the content of a variable, go to variable settings (parameter P5.9 – VARIABLE 1 or P5.10 – VARIABLE 2) and enter its content using directional keys (arrows) of the keypad or computer keyboard. The principles of entering texts are identical to the ones related to non-standard printouts.

11.5. Separator

The program allows you to select the type of separator in the printed mass format.

Options:

- DOT --. --
- COMMA --,--

<DOT> is a default value for the separator and used to print the mass value (e.g. 5.45 g). If you switch the parameter into <COMMA>, all mass values will be printed with a comma separator (e.g. 5,45 g).

12. DATABASES

The program uses 3 editable databases (USERS, PRODUCTS and TARES) as well as 2 non-editable databases (WEIGHING RECORDS and ALIBI) in which all measurements are saved.

The range of data that may be saved in particular databases:
USERS – 100 various users.
PRODUCTS – 1000 various products.
TARES – 100 various packaging masses.
WEIGHING RECORDS – 5 000 subsequent measurements.
ALIBI – 100 000 subsequent measurements.

12.1. Users

Each user may be assigned the following data:
NAME (30 characters), CODE (6 characters),
PASSWORD (8 characters, digits only),
PERMISSION LEVELS (USER, ADVANCED, ADMIN),
LANGUAGE (every available).

Permission levels
The software offers 3 permission levels: USER, ADVANCED, ADMIN.
Depending on the permission level, the access to user parameters edition, databases and program functions is showed in the table below.

Permission	Access level
USER	The access to parameter edition from the submenu: P2.1 AVAILABILITY, and INFORMATION and SHORTCUTS for each of working modes, as well as settings in the <MISCELLANEOUS> parameters group, aside from <P6.2 PERMISSION>, <P6.7 DATE> and <P6.8 TIME> settings. He has an access to information preview function in <Databases>, may define variables. He may initiate and perform all weighing procedures.
ADVANCED	The access to parameter edition from the submenu: <READOUT>; <WORKING MODES>; <COMMUNICATION>; <PERIPHERALS>; <MISCELLANEOUS>, aside from <P6.2 PERMISSION>, <P6.7 DATE> and <P6.8 TIME> settings. He may initiate and perform all weighing procedures.
ADMIN	The access to all user parameters, functions and edition of <Databases>.

To add a user, please follow the diagram below. Add a user, name it and provide other settings:



Once you have entered the user name, please enter further data:
user code – up to 6 characters,
user password – up to 6 digits,
select user permission level – USER/ADVANCED/ADMIN,
select menu language for the user.

To delete a user, please do as follows:

- Enter the user database.
- Select the user that is to be deleted from the database.
- Press →0← Delete key.
- The following question will be displayed in the lower row: <**DELETE?**>.
- Press ↵ key to confirm it.
- After confirming, the selected user will be deleted from the list.

After activating the balance, the display unit remains active, which allows you to make mass measurements with no need to log in.

12.2. Products

The **PRODUCTS** database contains 1000 various products. The following data can be assigned to each product:

- NAME (30 characters),
- CODE (6 characters),
- EAN (16 characters),
- MASS (with a reading unit precision),
- TARE (mass of packaging related to specific product, with reading unit precision),
- MIN (lower threshold for CHECKWEIGHING mode>, enter with reading unit precision),
- MAX (upper threshold for CHECKWEIGHING mode>, enter with reading unit precision),
- TOLERANCE (tolerance thresholds in [±] for <DOSING> mode, entered as % from target mass).

To add a product, enter the product database and add a name to the product (follow the same procedure as in adding a user – see description above), and then enter product-related data.

12.3. Tares

The **TARES** database contains 100 various packaging masses. You can enter the following data for each packaging:

- NAME (30 characters),
- TARE (packaging mass, must be entered with reading unit precision).

To add a tare – packaging mass, enter the tare database and add a name to the tare (follow the steps analogical to adding a user – see description above), and then enter other packaging-related data.

12.4. Weighing records

WEIGHING RECORDS database is a non-editable database. It means that data related to measurements are saved in this base instantly. You can only preview these data and possibly print or export them to the pendrive memory (see description of exporting in further sections of the manual).
The program allows you to save and store up to 5000 measurements.
Measurements are saved instantly every time you press <PRINT> key, with no need to take any additional actions or change settings.
Measurement-related data are also saved together with the result:

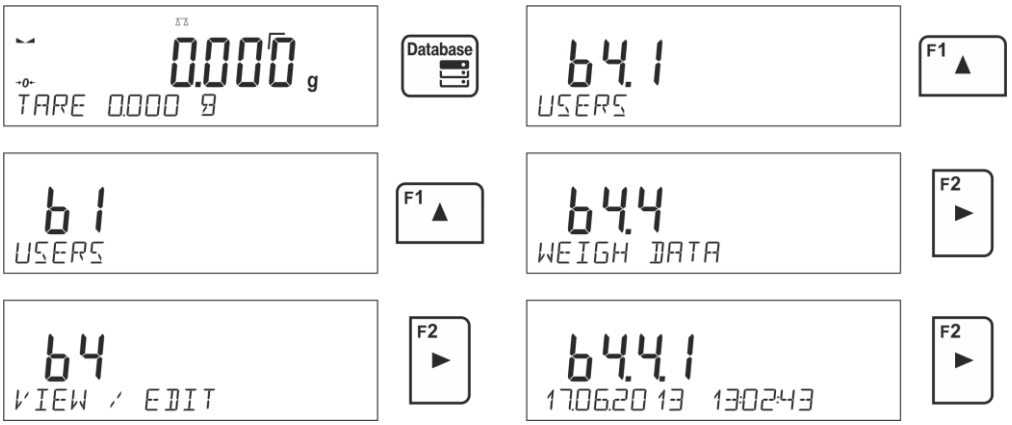
- Measurement date.
- Measurement time.
- Measurement result (mass).
- Tare value.
- Name of weighed product.
- Measuring person (logged user).
- Working mode applicable to the measurement.
- Variable 1 and 2 value.

Measurements are saved in the so-called loop. If the measurement no. 50001 is saved, the measurement no. 1 will be automatically deleted from the memory.

It is not possible to delete measurements saved in the memory.

You can preview and print data saved in the WEIGHING RECORDS database.

Procedure:



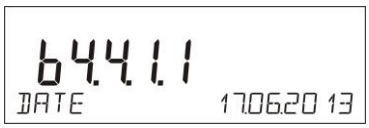
Every measurement is saved with its unique number. The number format takes the following form: b4.4.n; where <n> is a subsequent number of the measurement. For clarity, the date and time of performing the measurement are displayed in the lower row.

To switch between saved measurements, click either of the directional keys, i.e: F1 ▲ or F3 ▼. Click once to switch to another measurement upwards or downwards.

To preview other measurement-related data, select the specific measurement and then press F2 ► key.



The first data related to the measurement will be displayed in the lower row of the screen instantly.



Click either F1 ▲ or F3 ▼ key to change measurement-related data display (lower row of the screen). The data related to this measurement can be printed out by using <PRINT> item and clicking ↵ key.

Example of printout for specific record in the memory:

Date 21.06.2013
Time 13:05:02
User
Product

Tare 0.000 g
Gross 0.000 g
0.000 g
----------Adj. report----------
Adj. type Internal
User
Project 1234567890123459
Date 16.07.2013
Time 13:27:09
Balance ID 10353870
Adj. difference -0.004 g

Signature
.....

The data to be printed out depend on settings in P5.3 GLP PRINTOUT parameter. Depending on the data set for printout in this parameter (<YES> value), they will be printed out at this time. It also applies to printout of the weighing record in WEIGHING RECORDS database (see section 11.2).

12.5. ALIBI memory

The balance is equipped with the ALIBI memory allowing you to save and store up to 100 000 measurements.
The measurements are saved instantly every time you press <PRINT> key, with no need to take any additional actions or change settings.
Measurement-related data are also saved together with the result:

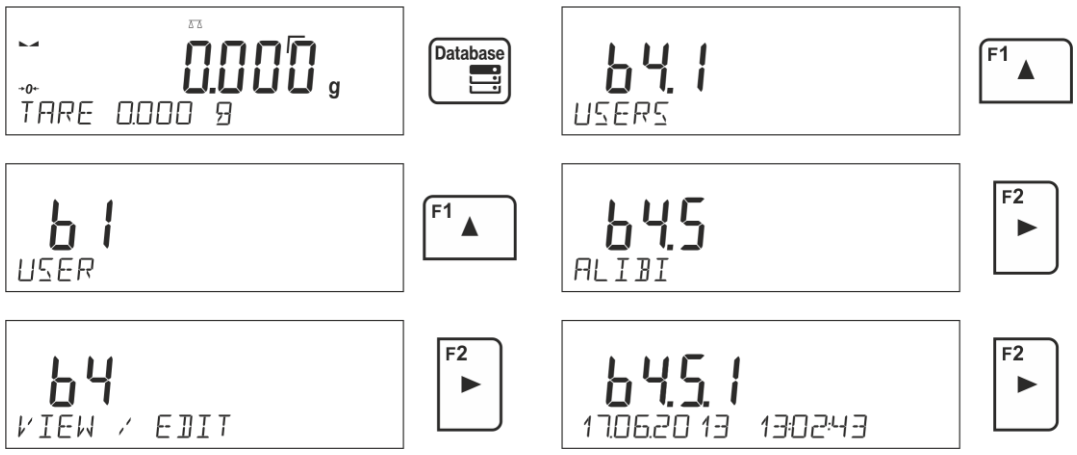
- Measurement date.
- Measurement time.
- Measurement result (mass).
- Tare value.
- Measuring person (logged user).
- Product name.

Measurements are saved in the so-called loop. If the measurement no. 100 001 is saved, the measurement no. 1 will be automatically deleted from the memory.

It is not possible to delete measurements saved in the memory.

You can preview and print data saved in the ALIBI memory.

Procedure:



Every measurement is saved with its unique number. The number format takes the following form: b4.5.n; where <n> is subsequent number of the measurement. For clarity, the date and time of performing the measurement are displayed in the lower row.

Operations in the ALIBI database are analogical to the ones described above for the weighing record database.

<u>Example of printout for specific record in ALIBI memory:</u>

Date	*19.06.2013*
Time	*6:48:41*
Result	*199.90 g*
Tare	*0.000 g*
User	*NOWAK*
Product	*TABLET*

To return to the weighing mode, press Units Esc key a few times.

13. FUNCTIONS

- Weighing

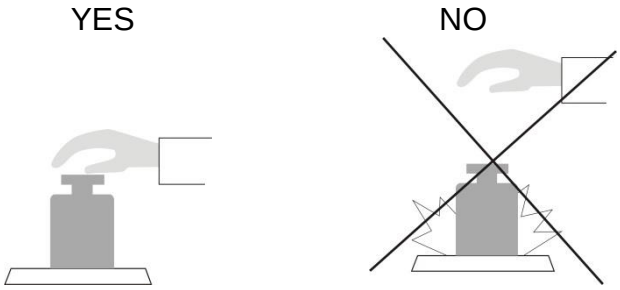
The method of setting this function has been described in further sections of the manual.

13.1. Weighing

13.1.1. Principles of correct weighing

In order to assure a long-lasting use and correct mass measurements, please follow the guidelines below:

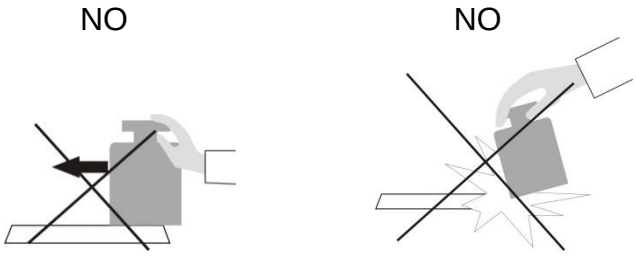
- Activate the balance with an empty weighing pan (permissible load upon activation is ±10% of the maximum lifting capacity).
- Load the weighing pan in a calm way and without shocks:



- Position loads in the centre of the weighing pan.



- Avoid side loading, particularly side impacts:



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

- Before you start measuring, load the weighing pan (a few times) with a load whose mass is close to the maximum lifting capacity limit,
- after removing the load, make sure the unloaded balance shows the exact zero - →0← symbol and check if the measurement is stable - ◣◢; if not, press →0←/**Delete** key,
- using **UNITS** key, set the weighing unit,
- put the weighed load on the weighing pan and read the weighing result when the value has stabilised,

- the mass value of the load on the weighing pan can be repeatedly tarred by pressing →**T←/Insert** key (please make sure the total of tarred loads for the memory does not exceed the maximum lifting capacity limit).

During breaks between subsequent series of measurements, do not unplug the balance from the mains. It is advisable to turn the display unit off by pressing **ON/OFF** key. Press **ON/OFF** key again to make the balance ready for another weighing cycle.

13.1.2. Zeroing

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

Note:
Zeroing is possible only up to ***±2%*** *of the maximum lifting capacity. If the zeroed value is more than* ***±2%*** *of the maximum lifting capacity, the following message will be displayed:* ***Err2****.*

13.1.3. Tarring

To determine the net mass, put the load packaging and press →T← Insert key when the value has stabilised. The exact zero mass value will be displayed, together with the following symbols: ***Net*** and ◣◢.
After removing the load and packaging, the total of tarred masses with a minus sign will be displayed.
You can assign the tare value to the product in the database. If you do so, the tare value data will be instantly collected after you have selected the product.

Note:
It is disallowed to tare negative values. An attempt to tare a negative value will trigger the ***Err3*** *error message. This being the case, zero the balance and retare.*

Manual tare entry
Procedure:

- While in any working mode, press one of the **F** quick-access keys that <**ENTER TARE**> item is assigned to (see description of setting further in the manual, in section F key shortcuts).
- A window will be displayed. Using directional arrow keys, enter the tare value and press ◎↵ key.
- The weighing mode will be restored and the tare value with „-” sign will be displayed.

Selection of tare from TARE database
Procedure:

- While in any working mode, press **F** quick-access key that <**SELECT TARE>** item is assigned to (see description of setting further in the manual, section F key shortcuts) or select <**SELECT TARE**> item after pressing Function key.
- The first packaging masses saved in the tare database will be displayed. Use directional arrow keys to select the tare to be called and press ◎↵ key.

- The weighing mode will be restored and the value of the selected tare with „-” sign will be displayed.

or

- While in any working mode, press 

key.
- Next enter b3 <TARE> item.
- The first packaging masses saved in the tare database will be displayed. Use directional arrow keys to select the tare to be called and press  key.
- The weighing mode will be restored and the value of the selected tare with „-” sign will be displayed.

Tare deletion

You can delete the tare value you have entered by pressing 

key on the facade of the balance or by entering the tare with a value of 0.000g (see description above).

13.1.4. Weighing profiles

For easier operation of the balance, there are 4 default profiles to work with. The settings have been selected and saved for them to make sure weighing is optimal in relation to specific expectations and conditions.
The profile settings are related to a specific working mode and are grouped in the following parameter: *Setup/Working modes/Weighing/Readout.*
The description of these settings can be accessed in another section of the manual.

These are the following profiles:

- **User** – a basic profile for which filter settings have been selected to make sure weighing is relatively fast and precise.
- **Fast** – this profile allows you to quickly weigh any masses, regardless of the working mode. Upon first activation, this profile is instantly launched. For this profile, parameters have been selected to make sure the final measurement result is obtained as quickly as possible,
- **Fast dosing** – this profile is dedicated to dosing and quick mass dosage.
- **Precision** – this profile is intended for precise weighing of any masses, regardless of the working mode. The weighing procedure is the longest for this profile, yet the final result is the most precise.

Note: you can fully modify the profile settings only with regard to the User profile. Other default profiles (Fast, Fast dosing and Precision) may be modified only to a limited extent.

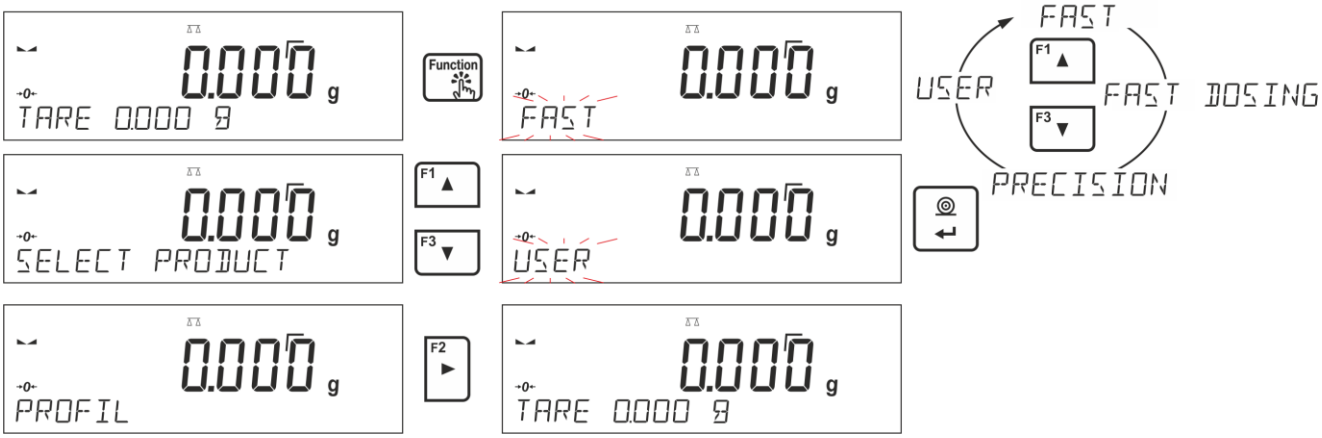
A currently selected inscription (profile name) may be displayed in the lower row. The profile may be adapted to the working mode on a case-by-case basis. The device remembers the last used profile in all of the modes (together with user modifications) and launches the mode with such a profile when selected.

Procedure:

* While in any working mode, press **F** quick-access key that **<PROFILE>** item is assigned to (see description of settings further in the manual, in section *F key shortcuts)* or select <**PROFILE**> item after pressing 

key.

* Using directional arrow keys, select the profile to be used and press key.
* The weighing mode will be restored and the specific profile will be used for operation.

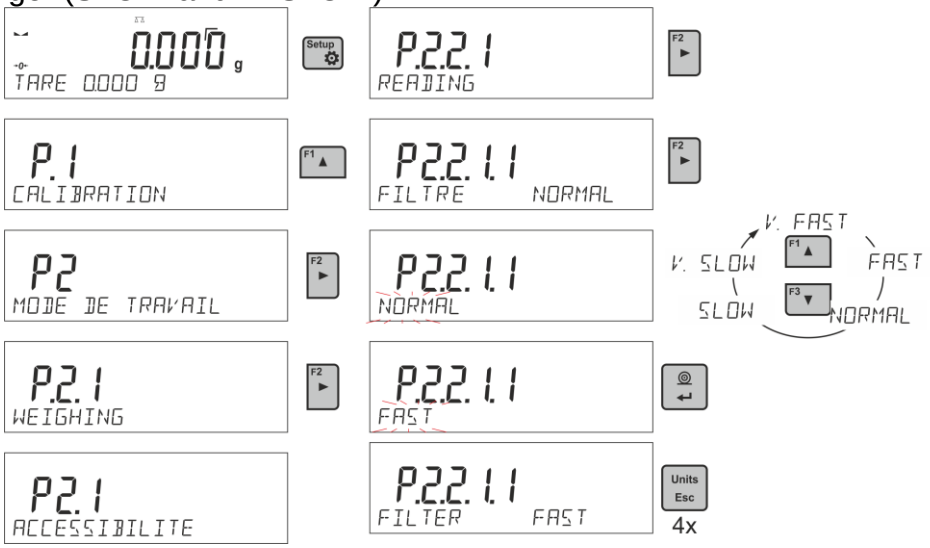


13.1.5. Settings for <WEIGHING> mode – readout

The program allows you to configure useful parameters (filters, result approval and autozero operation, last digit blanking and other settings) for each working mode separately.
It allows adapting the device and its useful properties to the specific working mode (e.g. DOSING) as per user's needs and expectations or requirements, which assures easy and fast operation.

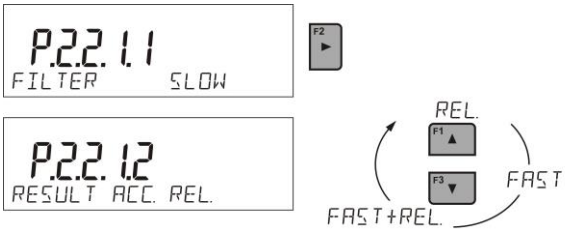
Filtering settings (unavailable to Fast, Fast dosing, Precision profiles).

Depending on working conditions, set the filter. If the conditions are ideal, set the very fast filter (P.2.2.1.1 parameter value into V. FAST). If the conditions are unstable (i.e. vibrations, draughts), switch the filter into slow or very slow (P.2.2.1.1 parameter value into SLOW or V. SLOW). Efficiency of the filter varies, depending on the weighing range. The filter is weaker while value is „approaching" the weighed mass, and stronger when the mass has reached the filter range (filter parameter is available only from the service menu – the operator cannot access it).
Depending on the filter you have set, the weighing time will be shorter (V. FAST and FAST values) or longer (SLOW and V. SLOW).



Result approval (unavailable to Fast, Fast dosing, Precision profiles)

To adapt the balance to variable ambient conditions, please select the result approval as **FAST+PREC, FAST** or **PRECISE.** Depending on the variant you choose, the weighing time will be shorter or longer.

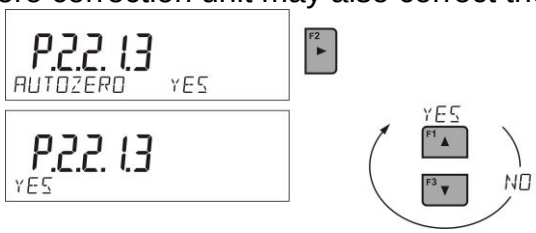


Autozero function

To assure precise values, the autozero function (Auto) has been introduced. The task of this function is to automatically control and correct the zero value. When this function is active, subsequent results are compared at predefined time intervals, e.g. every 1 sec., e.g. when the weighing pan is unloaded and values are close to zero. If these results differ by fewer than the declared autozero range, e.g. 1 reading unit, the balance will instantly reset and stable result and zero value markers will be displayed: ◣◢ and –→0←**,** respectively**.**

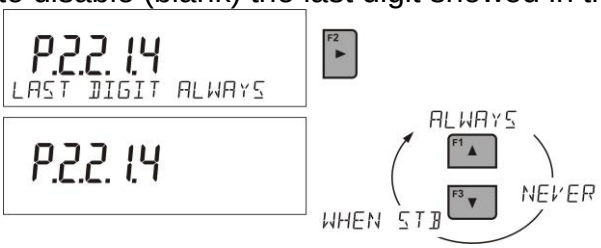
When the autozero function is enabled, very measurement starts from precise zero. There are however situations in which this function hinders measuring. The example is when you put the load on the weighing pan very slowly (e.g. add a load).

This being the case, the zero correction unit may also correct the real load mass.



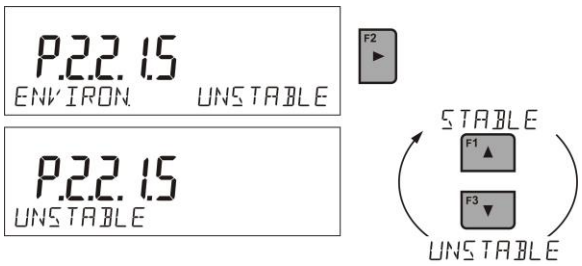
Last digit display

This function allows you to disable (blank) the last digit showed in the mass screen.



Working conditions

This parameter offers two variants: STABLE and UNSTABLE. If you set STABLE, the balance starts working much faster, i.e. weighing time is a way shorter when compared to UNSTABLE item. This parameter refers to surrounding and working conditions of the balance. If ambient conditions are unstable, it is advisable to switch <AMBIENT CONDITIONS> parameter into <UNSTAB>. By default this parameter is set into <STABLE>.



13.1.6. AUTOTARE

The automatic tare function is used to quickly specify the net mass of weighed loads when the tare value is different for every other load.
When this function is active (<P2.2.2 AUTOTARE> parameter value into <YES>), the working cycle is as follows:

- When the weighing pan is empty, press zeroing key.
- Next put the product packaging.
- Once the value has stabilised, the packaging mass **will be tarred automatically** (Net marker will be displayed at the top of the screen).
- Then put the product into the packaging – the product net mass will be displayed.
- Remove the product and its packaging.
- The tare value will be deleted (packaging mas, saved in the memory in the first step of the procedure) after exceeding the gross mass value set in < **P 2.2.3.2 PROG AUTO**> parameter.
- Put the packaging of another product. When the value has stabilised, the packaging mass will be tarred instantly (Net marker will be displayed at the top of the screen).
- Insert another product in the packaging.

To assure correct operation of the AUTOTARE function, set the threshold value too.



<P 2.2.3.2 PROG AUTO> parameter is related to the following functions:
- automatic tare,
- automatic operation.

Another automatic tarring will be performed only after the load mass drops below the gross mass value set in **< P 2.2.3.2 PROG AUTO>** parameter.

13.1.7. Printout mode

This function allows you to set the printout mode, that is key activity.
There are the following settings that you can select:

- <WHEN STAB>: only the stable result and <GLP PRINTOUT> parameter settings will be sent to the printer port. Press key when the result is unstable (no mark in the screen), to send the result to the port only when the stability condition has been met.
- <EVERY>: every time you press key, you will send the weighing result and settings for <GLP PRINTOUT> parameter to the printer port. Every result (i.e. stable and unstable) will be sent. In the case of the unstable result, the <?> mark will be available at the beginning of the result frame. **This function is available only in non-verified balances**.
- <AUTO>: select this item to enable the measurement automatic printout. Remember to set <PROG AUTO> parameter, as per your needs, when you select this option.
- <AUTO WITH INT.>: select this item to activate automatic printout and record in WEIGHING RECORD DATABASE and ALIBI database – cyclically, with a specific interval. The interval can be set in [min] in P2.2.3.3 <INTERVAL A.> parameter. The interval ranges from 1 min to 9999 min.

For automatic operation with the interval, set the interval value in [min] too.

The figure below shows the interval value set into 2 min.

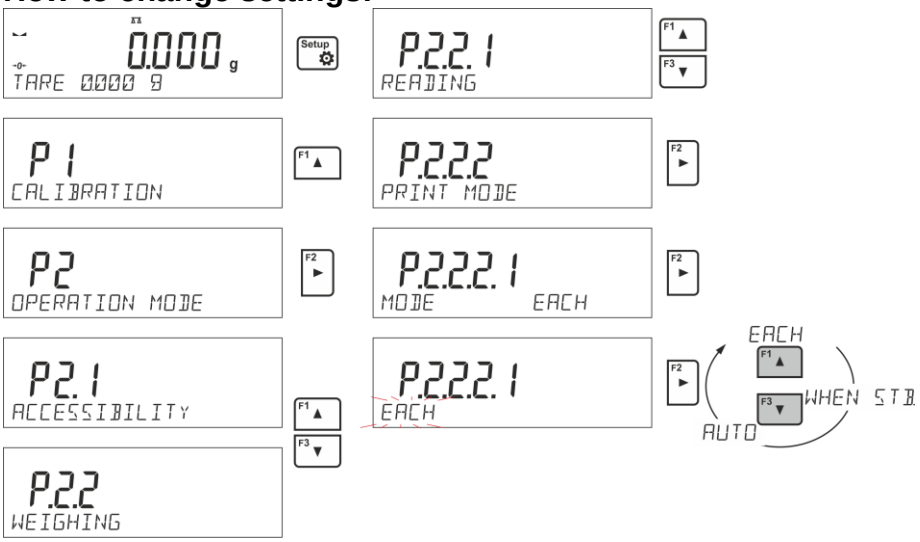


Note:
Every result is printed and remembered: stable (verified balance) and unstable (non-verified balance).
Automatic operation with the interval starts from enabling this option and remains active until you disable it.
After enabling the autoprintout with interval, PRINT key remains inactive (no printing when pressed).

The automatic operation is as follows:

- Press →0← Delete key to zero the balance (the display unit will show stable measurement marker and →0← zero marker).
- Put the load and the first stable measurement value will be sent to the printer port.
- Remove the load from the weighing pan.
- Another measurement will be possible when the value displayed before another measurement is lower than the value set in <PROG AUTO> parameter (zero is not required at another measurement).

How to change settings:

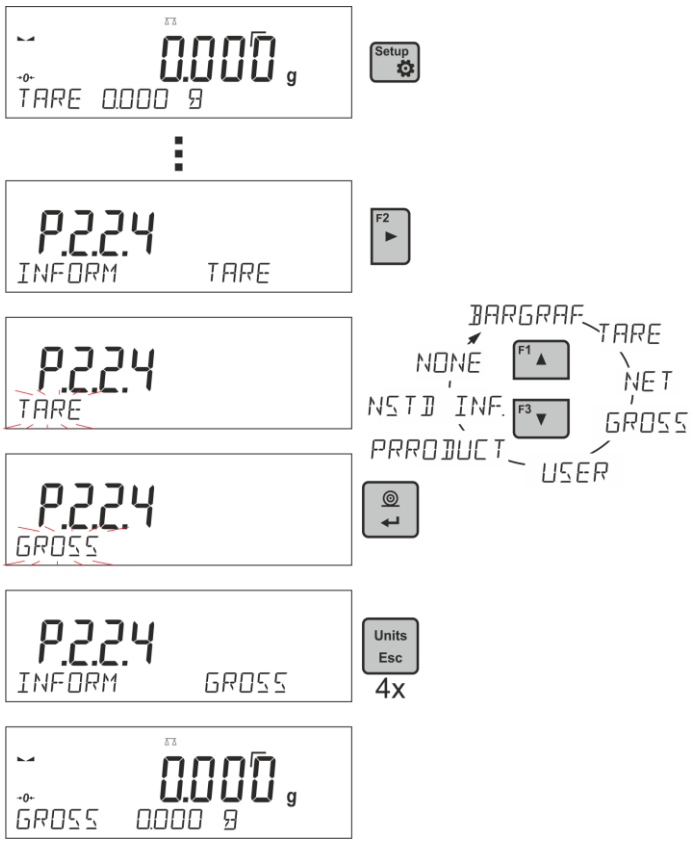


For automatic operation, set the threshold value too.



13.1.8. Information

This function allows you to display additional information in the lower row of the screen. Depending on your needs, you can select the following information to be displayed on an ongoing basis while working in <**WEIGHING>** mode:



<BARGRAPH> item uses graphics to show the lifting capacity of the balance, ranging from 0 to MAX.

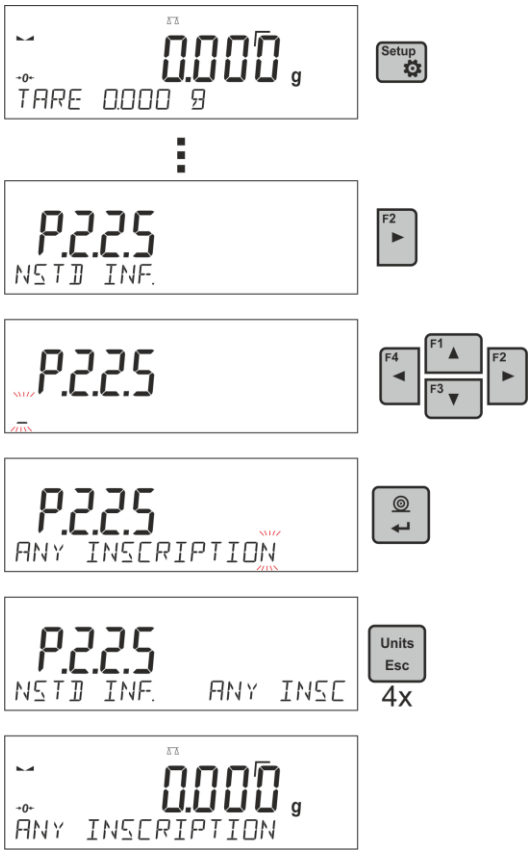


See above for the example of PS 1000.42 balance display unit with enabled <BARGRAPH> item: the load of 500g is placed on the weighing pan, this represents 50% of the use of maximum lifting capacity (half of the bargraph in the lower row is filled).

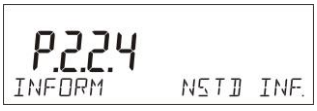
You can enable <BARGRAPH> item also in the following modes: PART COUNTING, CHECKWEIGHING, DOSING, DEVIATIONS, ANIMAL WEIGHING, STATISTICS, SUMMING, MAX HOLD.

13.1.9. Non-standard information

This function allows you to declare the content of non-standard information that is to be displayed in the lower row of the screen. You can declare any text that is composed of up to 19 characters.

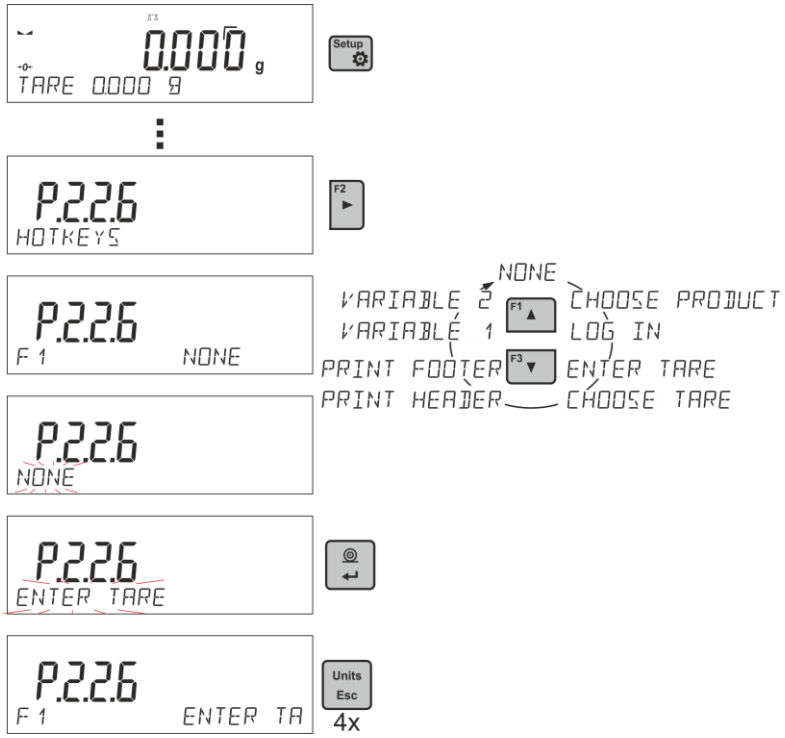


Please remember to switch **P2.1.2** item into **<INF. NSTD>** value to make sure the non-standard information you enter is visible.



13.1.10. F key shortcuts

This function allows you to declare the quick access options for the weighing function, available under F1, F2, F3 and F4 keys. In <**WEIGHING>** mode, you can select the following items that you can freely assign to any of the F keys: < NONE / ENTER TARE / PRINT HEADER / PRINT FOOTER / VARIABLE 1 / VARIABLE 2>. In other modes, other options are also available (see further sections of the manual).



Function selection variants for particular working modes:

Function	*Available in mode*
SELECT PRODUCT	In all modes
LOG IN	In all modes
ENTER TARE	In all modes
SELECT TARE	In all modes
PRINT HEADER	In all modes
PRINT FOOTER	In all modes
VARIABLE 1	In all modes
VARIABLE 2	In all modes
LAST DIGIT ON/OFF	In all modes except for part counting and deviations
ENTER STANDARD	In part counting, dosing, deviations
DETERMINE STANDARD	In part counting, deviations
ENTER THRESHOLDS	In checkweighing only
START	In animal weighing, solid density weighing, liquid

	density weighing, pipette calibration
RESULT	In statistics and adding
FINISH	In statistics, summing and adding
DELETE LAST	In summing and adding
PROFILE	In all modes

14. COMMUNICATION

In the **Communication** menu, you can configure port settings.

To gain access, you need to press Setup key.

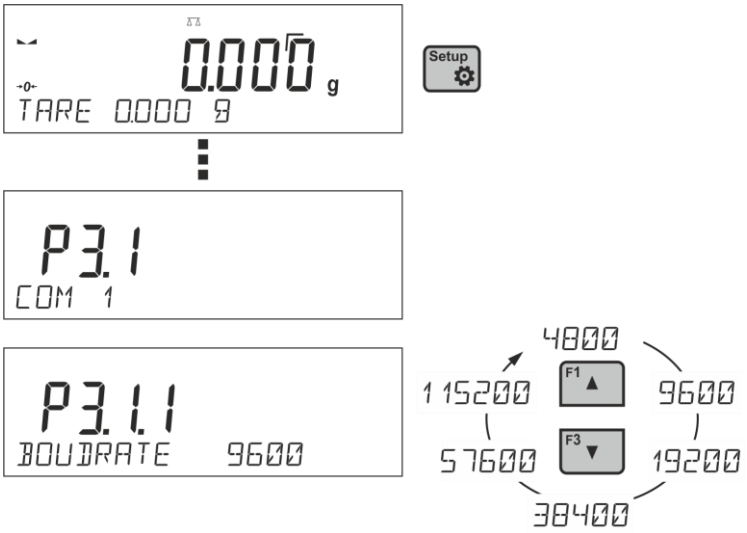
The balance can communicate with an external device (peripheral) via the following port:

- COM 1 (RS232),

14.1. RS 232 (COM 1) port settings

Procedure:

- Select <COM 1> communication port.
- Next set relevant values:



For RS 232 port settings, the following transmission parameters are available:

- transmission rate – 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s,
- parity – NONE, ODD, EVEN.

15. PERIPHERALS

The **Peripherals** menu can be accessed in the Parameters menu. To gain access to this menu, press Setup key. The menu contains a list of devices that may cooperate with the balance.

15.1. Computer

In <COMPUTER> submenu, you can select the port to which the computer with the program for communication with balance activation or deactivation of continuous transmission or shutdown is connected.

15.1.1. Computer connection port

Procedure:

- Press Setup key.
- Enter <P4 PERIPHERALS> menu.
- Next enter <P4.1 COMPUTER> menu group.
- Select the port that the computer is to be connected to:

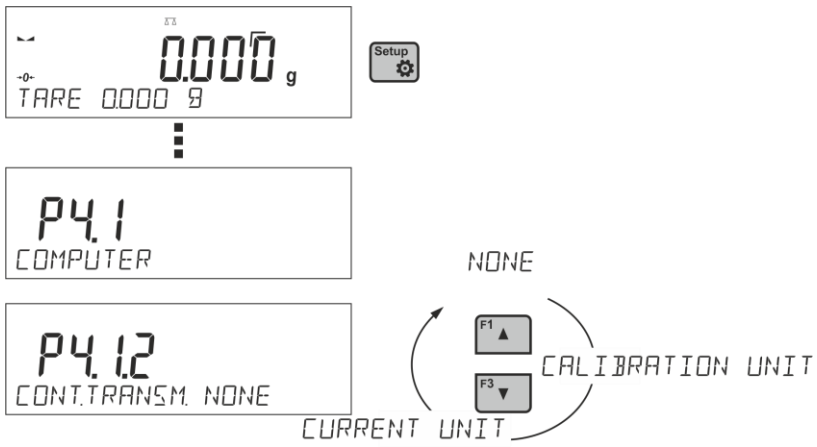
- COM 1 – RS 232 port that the computer is connected to,

15.1.2. Continuous transmission

This parameter allows you to activate or deactivate continuous transmission for weighing result. You can set one of the following three variants:

- continuous transmission in adjustment unit <CAL. UNIT>: regardless of what mass unit is currently selected, the value transmission applies to the main unit of the balance (adjustment unit),
- continuous transmission in current unit <CUT. UNIT>: value transmission applies to currently used unit and changes dynamically as per the change of unit in the screen (Units key),
- continuous transmission is disabled: <NONE>.

How to set:



Note:

You can also activate/deactivate the continuous transmission by sending a relevant command from the computer (see section 15: COMMUNICATION PROTOCOL).

15.1.3. Printout interval for continuous transmission

<P4.1.3 INTERVAL> parameter allows you to set printout frequency for continuous transmission. The printout frequency can be set in seconds, with an accuracy of 0.1 sec.
You can set the lower time value ranging from 1000 to 0.01 second.

This setting applies to continuous transmission in adjustment unit and current unit, activated from the balance (see P4.2.1.2 parameter) as well as continuous transmission activated via the computer command (see point 15: COMMUNICATION PROTOCOL).

15.1.4. Printout

The type of printout that will be sent to the port selected for connection of the computer.

Procedure:

- Press Setup key.
- Enter <P4 PERIPHERALS> menu.
- Next enter <P4.1 COMPUTER> menu group.
- Then select <P4.1.7 PRINTOUT> parameter.
- Select printout:
  - NONE – no printout has been selected
  - P**. NSTD 1 ÷ 4** – one of the non-standard printouts (see description of non-standard printouts)

16. ERROR MESSAGES

-Err2-	Value out of zeroing range
-Err3-	Value out of tarring range
-Err8-	Tarring/zeroing timeout
-NULL-	Zero value from transducer
-FULL-	Measuring range exceeded
-LH-	Start mass error