
SQC
in laboratory
The more data the higher precision
radwag.com

SQC in laboratory

Only series of measurements analysis can provide information on the measurement result accuracy. Automaton of this process by means of Auto-SQC, like in Radwag balances, guarantees quick reaction. It is especially crucial for these laboratories that work in feedback kind of cooperation with production departments.

Analysis of plethora of information is not a problematic issue whenever ergonomic solutions offeredby Radwag are in use.

Being aware of the multiple possibilities of usage, Radwag applications consist of two modules of Statistics. These modules are different in terms of functional capabilities. The first one enables statistical operation performance on freely selected data. Statistical operation provides the user with information on sum, mean value, Min and Max value, range, standard deviation and variance. This module is characteristic for offering the possibility of adding new measurements to an already performed series of measurements (OPEN formula).

The second module, called SQC, i.e. Statistical Quality Control, is intended for mass control of a sample, wherein the weighment tolerance has been specified. The particular process may be defined clearly by a batch number and by a quantity of m easurements performed per series. The module's characteristic feature is the lack of possibility to add new measurements to an already performed series (CLOSE formula).

Considerable advantage of this module is presentation of sample weight by means of graph (SQC- GRAPH). The visual presentation is an invaluable asset for the process of sampling.

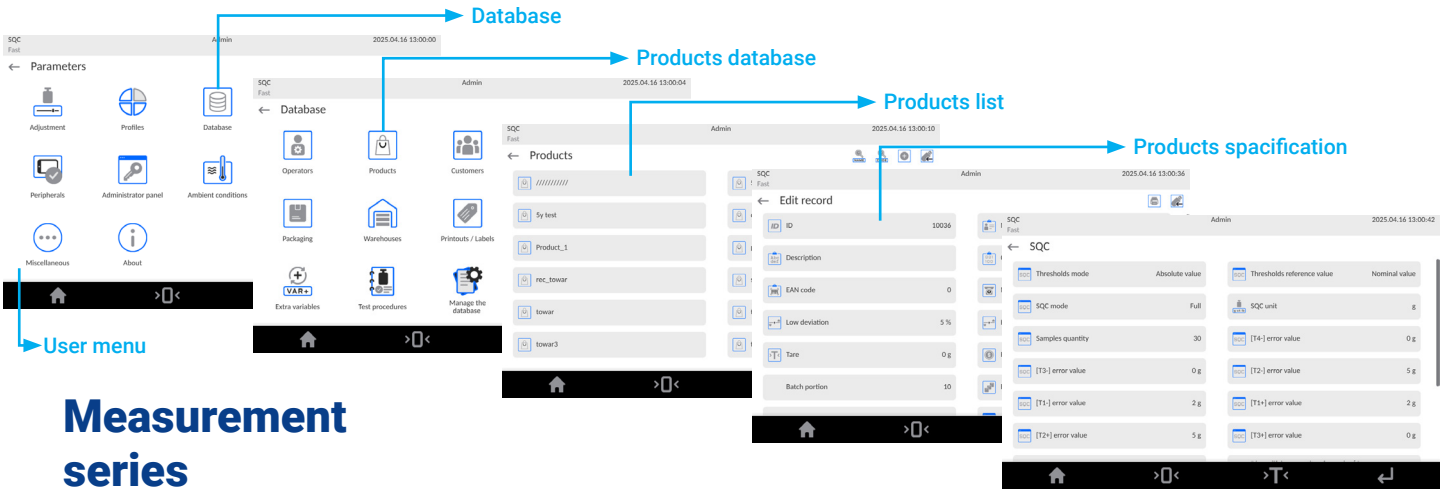
Statistics

Statistics module offers possibility of quick analysis of data regardless of rigors driven by tolerance. Net weight measurement may be performed with different tare settings (single, sum of all, autotare etc.)

Initial filtration of measuring data

Initial filtration is possible, when for a product selected from a database which is to be analyzed, the percent tolerance has been specified in relation to reference mass. In addition to that, the result control function has to be activated. Through such operation only those measurements which are within the weighment tolerance will be selected for analysis. Initial filtration procedure allows to eliminate not only those measurement which are not within the weighment tolerance but also random ones.

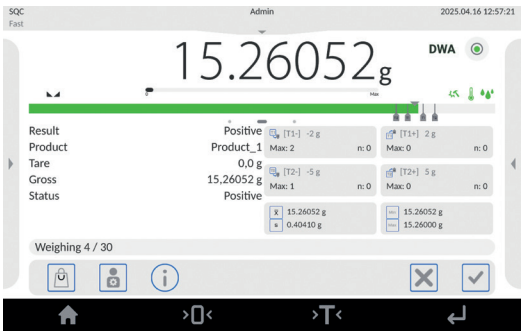
Tolerance settings for a sample



Measurement series

Statistical data are displayed in an Info workspace, all the information is updated on-line after each performed measurement.

The user can:
- Adjust the content of Info workspace (personalization);
- View complete information on measurement data at any time;
- Save information, print reports.



Report example

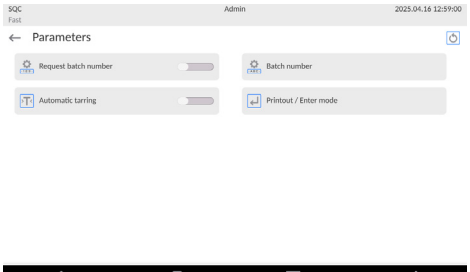
Statistics		
Min	100,10%	100,1 g
Max	104,30%	104,3 g
Dispersion	4,20%	4,2 g
Average	100,29%	100,287 g
Std. div.	0,78%	0,7785 g
Average - Nom.	>TM+	0,287 g
Sum		3008,6 g
Result		Negative

SQC Statistical Quality Control

Statistics module SQC is an ingenious device for control of various samples' weight. The tests may be performed either within production (critical limits and warning limits) or in-course of other monitoring processes.
All data is permanently saved to balance memory thus allowing for its potential verification (compliance with legal acts, branch regulations, etc.)

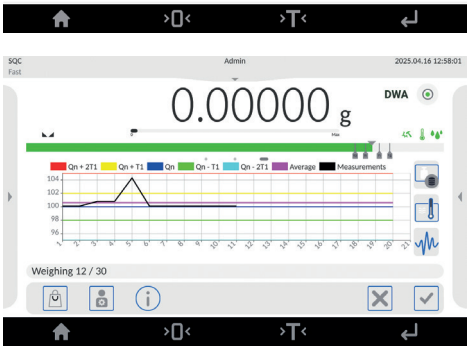
Ergonomics, personalization

The user has three touch panels at his disposal allowing him to freely configure measuring procedures, e.g. number of measurements, names, printouts etc.



Panel allowing specification of test parameters such as batch quantity, control performed accordingly to a given tolerance. Possibility of adjusting a given procedure printout to the users needs is offered.

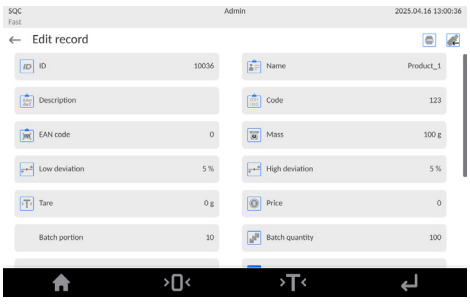
The user can specify the record mode of measurements (manual, automatic, f or s table measurements, with the use of low or high threshold value).



Precise weighing module serves for performing measurements with user-specified parameters for stability and filtering of the measuring signal.
It guarantees measurement accuracy regardless of any influence factors.

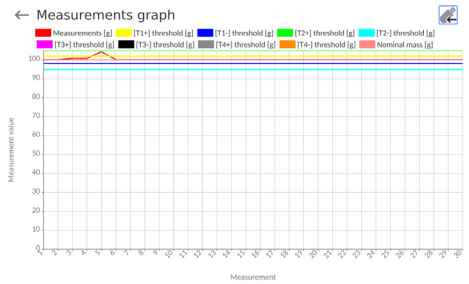
SQC-Graph

The user has at his disposal function of automatic adjustment of weighment tolerance (bargraph) thus being able to perform sampling as safely and quickly as needed.



SQC Reports is a brand new device intended for storing and processing great deal of information.
It records various information on performed test to a database, ie. test number, name, statistical data, information data.

SQC Reports contain Viewer- Graph module which enables dynamic adjustment of the graphs.



Viewer-Graph

The graph can be freely and easily adjusted.
All the user has to do is to touch the panel and move finger to a demanded position in order to enforce automatic adjustment of the graph.
When willing to return to the initial settings the user has to press the zoom icon.

SQC Statistical Quality Control

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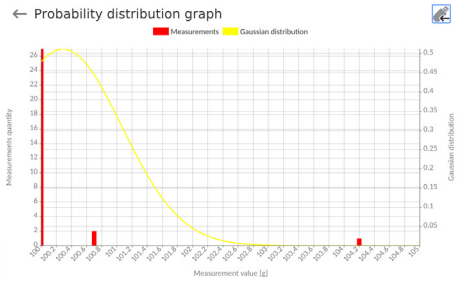
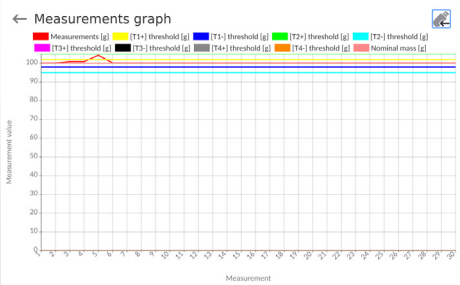
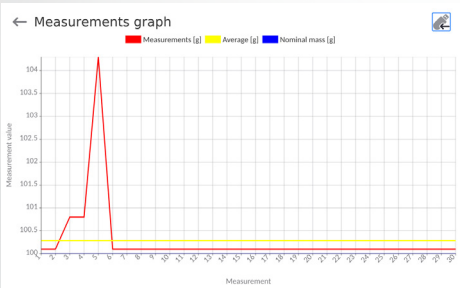
Record

Information on the monitoring process allows to verify data at any moment. This guarantees compliance with quality systems such as ISO, GLP, GMP, HACCP, etc.








```
--- Report number: S/16/04/25/12/58 ----
----------------------------------------
Balance type                       PM 5Y
Range                            3000 g
Balance weighing interval          0.1 g
Balance S/N                            1

Start date          2025.04.16 12:56:58
End date            2025.04.16 12:58:17
Method                             SQC
SQC mode                          Full
Operator                         Admin
Product                       Product_1
Batch number
Batch quantity                       100
Measurements quantity                 30
Nominal mass                     100 g
Tare                               0 g
Density                        0 g/cm?

------------ Error values -------------
[T2-]                 5,00%          5 g
[T1-]                 2,00%          2 g
[T1+]                 2,00%          2 g
[T2+]                 5,00%          5 g

------------ Measurements -------------
1.                | |  #  | |      100,1 g
1.   100,1 g
Net                                100,1 g
2.                | |  #  | |      100,1 g
2.   100,1 g
Net                                100,1 g
3.                | |  |# | |      100,8 g
3.   100,8 g
Net                                100,8 g
4.                | |  |# | |      100,8 g
4.   100,8 g
Net                                100,8 g

---------- Number of errors ----------
T4-                   0,00%          0/0
T3-                   0,00%          0/0
T2-                   0,00%          0/0
T1-                   0,00%          0/1
T1+                   3,33%          1/0
T2+                   0,00%          0/0
T3+                   0,00%          0/0
T4+                   0,00%          0/0

------------ Statistics ---------------
Min                 100,10%      100,1 g
Max                 104,30%      104,3 g
Dispersion            4,20%        4,2 g
Average             100,29%    100,287 g
Std. div.             0,78%    0,7785 g
Average - Nom.         >TM+      0,287 g
Sum                              3008,6 g
Result                          Negative


----------------------------------------
Signature
```

SQC Statistical Quality Control

Statistics module SQC is an ingenious device for control of various samples' weight. The tests may be performed either within production (critical limits and warning limits) or in-course of other monitoring processes.

Archiving

Export of information guarantees data safety and possibility to analyze the data by means of other computer systems. Regular printout means quick assessment of a particular thresholds (T1/T2).

Report

The analysis results may be sent to a chosen peripheral device (printer/computer).

```
------------------ SQC -----------------
Operator                          en
Product                        probe 1
Start date          2025.04.19 13:18:28
End date            2025.04.19 13:21:54
Batch number                    43786
Batch quantity                     10
Nominal mass                   10.3 g
T2- threshold       1.03 g      10 %
T1- threshold       0.515 g      5 %
T1+ threshold       0.515 g      5 %
T2+ threshold       1.03 g      10 %

------------- Measurement 1 -------------
Net                    10.361[0] g
------------- Measurement 2 -------------
Net                    10.373[1] g
. . . . . .
```

Export

The analysis results may be sent to a chosen peripheral device (printer/computer).

- analyse
- information
- procedures
- production
- sample
- verification
- S_16_04_25_12_41_154231.tdb
- S_16_04_25_12_58_154231.tdb

Printout

Export
- record form

S_16_04_25_12_41_154231

(date) (time) (serial no.)

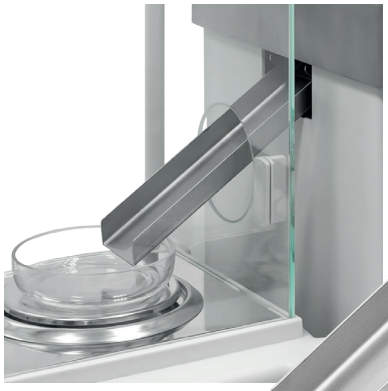
SQC Automatic cycle measurement

Automatic cycle measurement requires cooperation of at least two devices. The first one is PA-04 /H automatic feeder which forms an ordered set out of a particular number of randomly arranged elements. Thus prepared sample's elements are separately transferred one by one by means of a chute to a weighing pan. The second device is balance which measures the elements and records their mass. These two devices work in feedback kind of cooperation for which the vibration level may be adjusted.

Detector of elements

All the tested elements are recorded

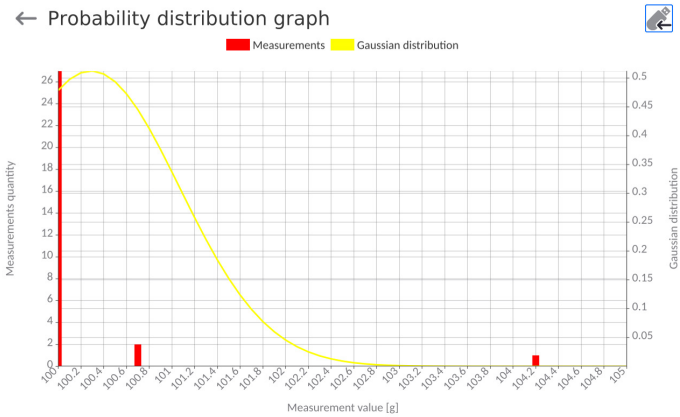
Special solutions

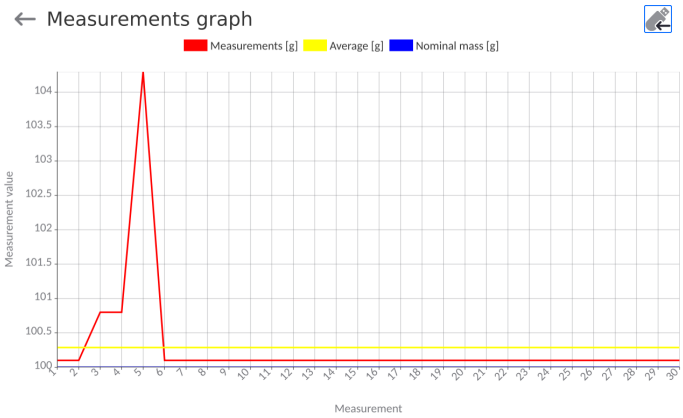


Resistance to infuence factors

PA-04 /H automatic feeder

SQC MODULE of .5Y series balances presents statistical analysis in a form of chart directly on a balance display. The charts may be printed on a freely chosen printer (PLC) or exported to .bmp file (transfer to USB port).





PA-04/H TECHNICAL DATA	PA-04/H
Fed object diameter	3 ÷ 10 mm
Feeder diameter	180 mm
Height of feeder's vibrating element	70 mm
Feeder speed	1 ÷ 15 pcs / min

SQC Automatic cycle measurement

All statistical operations related to a tested sample are performed by SQC MODULE. This makes the statistical control workstation a mobile one and therefore it can be located in various production or control areas. EXPORT option of .5Y series balances allows sending demanded data concerning tested sample to a superior computer system.

Report example

MAIN INFORMATION

The tested sample may be defined in a balance **DATABASE**. Its reference value must be specified in terms of mass and quantity. The tolerance thresholds must be given. Information may be updated by means of **DATABASE EDITOR** computer software.

MEASUREMENTS

The measurement accuracy depends on applied balance type. Generally while selecting balance one should remember that the smaller sample weight is (this condition refers to a single element weight) the smaller scales interval should be chosen.

REPEATABILITY is the most important balance parameter that needs to be considered while selecting an appropriate balance type for cooperation with an automatic feeder.

RESULTS

Sample analysis results are recorded into database and into **ALIBI MEMORY**. Both, text and graphic form of the measurements can be analyzed.
Transfer of data to other applications is possible due to EXPORT option.

```
--- Report number: S/16/04/25/12/58 ----
----------------------------------------
Balance type                       PM 5Y
Range                            3000 g
Balance weighing interval          0.1 g
Balance S/N                            1

Start date          2025.04.16 12:56:58
End date            2025.04.16 12:58:17
Method                             SQC
SQC mode                          Full
Operator                         Admin
Product                      Product_1
Batch number
Batch quantity                       100
Measurements quantity                30
Nominal mass                     100 g
Tare                               0 g
Density                        0 g/cm?

------------ Error values -------------
[T2-]               5,00%            5 g
[T1-]               2,00%            2 g
[T1+]               2,00%            2 g
[T2+]               5,00%            5 g

------------ Measurements -------------
1.            | |  #  | |        100,1 g
1.   100,1 g
Net                              100,1 g
2.            | |  #  | |        100,1 g
2.   100,1 g
Net                              100,1 g
3.            | |  |# | |        100,8 g
3.   100,8 g
Net                              100,8 g
4.            | |  |# | |        100,8 g
4.   100,8 g
Net                              100,8 g

---------- Number of errors ----------
T4-                 0,00%            0/0
T3-                 0,00%            0/0
T2-                 0,00%            0/0
T1-                 0,00%            0/1
T1+                 3,33%            1/0
T2+                 0,00%            0/0
T3+                 0,00%            0/0
T4+                 0,00%            0/0

------------- Statistics --------------
Min               100,10%        100,1 g
Max               104,30%        104,3 g
Dispersion          4,20%          4,2 g
Average           100,29%      100,287 g
Std. div.           0,78%       0,7785 g
Average - Nom.       >TM+        0,287 g
Sum                             3008,6 g
Result                         Negative


----------------------------------------
Signature
```

R2 Series

Statistics

The R2 series balance is a reliable device which meets requirements of any laboratory. It features an LCD display with a new text information line, 14-button keypad and automatic adjustment system.

Statistics function is one of many applications to which the user gets access via the user menu. The function is supported with information contained within databases such as Users Database, Products Database, Packagings Database (tares).

Statistics report consists of 3 defined areas, header, footer and measurements area where statistical results are printed.

Report example

The analysis results may be sent to a chosen peripheral device (printer/computer).

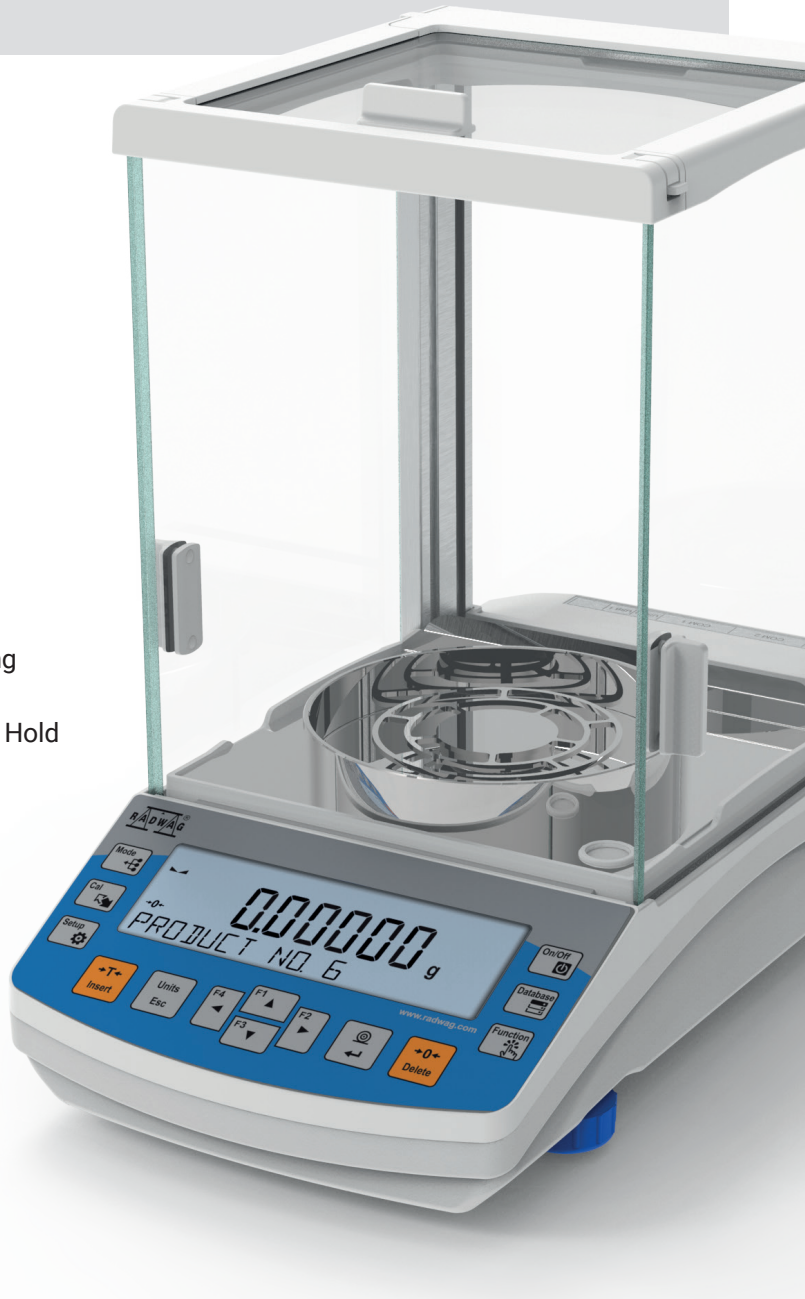
```
Operation mode                Statistics
Date                          18.04.2025
Time                          15:06:13
Operator                          Jack

      7.202[8] g
      7.114[5] g
      7.174[3] g
      7.168[3] g
      7.216[7] g
      7.180[1] g
      7.171[2] g
      7.210[7] g
      7.204[0] g
      7.176[2] g
----------Statistics----------
N                              10
Sum                      71.8188 g
Avg                      7.18188 g
Min                      7.1145 g
Max                      7.2167 g
Dif                      0.1022 g
Sdv                      0.028109 g
Rdv                         0.39 %
-----------------------------------
Signature
.....
```

FUNCTIONS:

- Weighing
- Parts Counting
- Checkweighing
- Dosing
- Percent Setup
- Solids Density
- Liquids Density
- Animal Weighing
- **Statistics**
- Totalizing Peak Hold

The R2 series comprises various balance types with weighing accuracy ranging from 0.01 mg to 0,1 g. Capabilities of all the series types in terms of statistical analysis are identical.



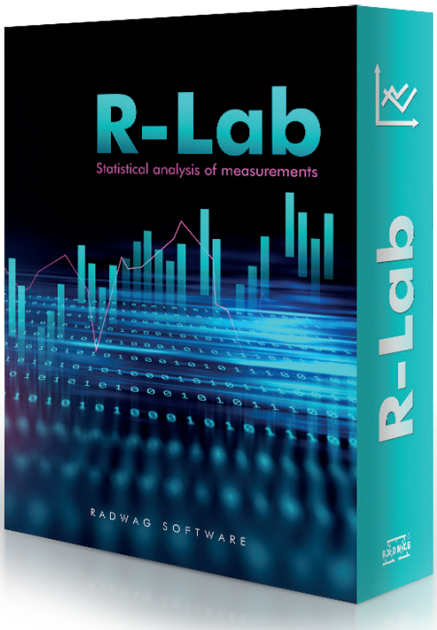
Quick access to information

The balance comprises 2 buttons enabling easy access to DataBase and Functions. Additionally it is equipped with 4 programmable function keys F1-F4. The function keys can perform different operations for each mode:

· header printout · tare editing · footer printout · product selection

Statistic
Analysis with the use of computer software

PC software is a useful tool allowing transfer any data from a freely chosen weighing device. Connection between the balance and the software is either wireless (Wi-Fi) or established via communication interface (usually RS 232) or Ethernet.



R-Lab
flexibility and reliability

R-Lab is an to-date program that stores, presents and subjects to statistical analysis all the measurements carried out using RADWAG-manufactured balances and scales. The software offers advanced functions of stomizing graphs and reports for 20 weighing instruments.

Measurement Record:
- manual: the mea urement record is carried out upon pressing print/enter key.
- automatic: performance of series of measurements of specified quantity and time interval.

Weighing data readout and export to file of the following formats: PDF, MHT (Web), XLS and XLSX (Excel), CSV, text or graphic.

Data visualization (weighings presented in a form of graph):
- measurements graph with statistics data,
- Gaussian distribution graph and a histogram,
- stability graph showing difference between successive measurements,
- all in one graph.

- Statistics - statistical processing of weighing data.
- Generating reports for a selected series of measurements, and possibility of reports filtering.
- Transfer of data from the weighing device to a computer:
  - data transfer using key located on the operation panel
  - data transfer using computer keyboard
  - entering balance-displayed data in keyboard cursor position.

RadKey
unsophisticated program, endless possibilities

By means of this simple application you can capture the weighing result and transfer it to any text editor or spreadsheet.

- Reading weighing data and transfer to any freely selected program (TXT, XLS, DOC, RTF).
- Record of data to file.
- Programmable Hot-key for weighing result tarring and readout.
- Conversion of text characters to numeric ones (spreadsheets acceptable).
- Storing data in rows or columns (control characters).
- Language versions: Polish, Czech, English, German, French.

We do not sell packaging version of the software. The above presented packagings serve virtual purposes exclusively.