

# AS R PLUS Analytical Balances

Innovative design and system solutions for standard-class products



AS R2 PLUS, d = 0.01 mg



AS R1 PLUS, d = 0.1 mg  
AS R2 PLUS, d = 0.1 mg



Communication interfaces



Large LCD display with text information section

## Functions

|                                                                                                     |                                                                                                     |                                                                                                           |                                                                                                                     |                                                                                                         |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|  Parts counting   |  Statistics      |  Density determination |  Totalizing                     |  Alibi memory      |
|  Dosing           |  Animal weighing |  Under hook weighing   |  GLP procedures                 |  Replaceable unit  |
|  Checkweighing    |  Autotest        |  Peak hold             |  Ambient conditions measurement |  Multilingual menu |
|  Percent Weighing |                                                                                                     |                                                                                                           |                                                                                                                     |                                                                                                         |

## Features

### Ergonomic Mechanical Design

Spacious weighing chamber and large open-door clearance allow easy access to the weighing pan and facilitate use of laboratory glassware of various sizes and dimensions. Improved aluminium base of the balance guarantees stability of the weighing system. DUAL-CLICK system facilitates tool-free disassembly and assembly of the weighing chamber. Locating the USB interface at the balance front makes it easier to communicate with peripherals.

### Levelling System

Clearly visible levelling device located at the front of the weighing chamber facilitates level control.

### Antistatic Weighing Chamber

Weighing chamber panes feature antistatic coating compensating electrostatic charges on the sample and accessories used for mass measurement.

### Uncomplicated and Intuitive Operation

Large, easy-to-read LCD display offers not only a clear presentation of the weighing result, but also enables displaying messages related to the drying process as well as pictograms of active functions and working modes. Quick access keys located on the operation panel enable you to run a given function with just one click.

### Data Management

AS R PLUS information system is based on operators, products, weighings and tares databases. All saved data can be analysed, exported, imported or exchanged between weighing instruments.

### ALIBI Memory

Internal ALIBI memory guarantees safety and automatic record of measurements copies, it also offers possibility to preview, copy and archive data.

### Kensington Lock

AS R PLUS balances are equipped with Kensington Lock, which allows to secure the device against theft.

Technical Specifications

|                                   | AS 60/220.R2 PLUS                                      | AS 62.R2 PLUS                                          | AS 82/220.R2 PLUS                                      | AS 120.R2 PLUS                                         |
|-----------------------------------|--------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| Maximum capacity [Max]            | 60 g / 220 g                                           | 62 g                                                   | 82 g / 220 g                                           | 120 g                                                  |
| Minimum load                      | 1 mg                                                   | 1 mg                                                   | 1 mg                                                   | 1 mg                                                   |
| Readability [d]                   | 0.01 mg / 0.1 mg                                       | 0.01 mg                                                | 0.01 mg / 0.1 mg                                       | 0.01 mg                                                |
| Verification scale interval [e]   | 1 mg                                                   | 1 mg                                                   | 1 mg                                                   | 1 mg                                                   |
| Tare range                        | -220 g                                                 | -62 g                                                  | -220 g                                                 | -120 g                                                 |
| Standard values                   |                                                        |                                                        |                                                        |                                                        |
| Repeatability(5% Max)*            | 0.012 mg                                               | 0.012 mg                                               | 0.012 mg                                               | 0.012 mg                                               |
| Repeatability(Max)*               | 0.08 mg                                                | 0.02 mg                                                | 0.08 mg                                                | 0.03 mg                                                |
| Minimum weight (USP)              | 24 mg                                                  | 24 mg                                                  | 24 mg                                                  | 24 mg                                                  |
| Minimum weight (U=1%, k=2)        | 2.4 mg                                                 | 2.4 mg                                                 | 2.4 mg                                                 | 2.4 mg                                                 |
| Permissible values                |                                                        |                                                        |                                                        |                                                        |
| Repeatability(5% Max)*            | 0.02 mg                                                | 0.018 mg                                               | 0.02 mg                                                | 0.02 mg                                                |
| Repeatability(Max)*               | 0.1 mg                                                 | 0.03 mg                                                | 0.1 mg                                                 | 0.05 mg                                                |
| Linearity                         | ± 0.05 mg / ±0.2 mg                                    | ± 0.05 mg                                              | ± 0.05 mg / ±0.2 mg                                    | ± 0.07 mg                                              |
| Stabilization time***             | 2 s                                                    | 2 s                                                    | 2 s                                                    | 2 s                                                    |
| Adjustment                        | internal                                               | internal                                               | internal                                               | internal                                               |
| Verification                      | Yes                                                    | Yes                                                    | Yes                                                    | Yes                                                    |
| OIML Class                        | I                                                      | I                                                      | I                                                      | I                                                      |
| Display                           | LCD (with backlight)                                   | LCD (with backlight)                                   | LCD (with backlight)                                   | LCD (with backlight)                                   |
| Keypad                            | 14 keys                                                | 14 keys                                                | 14 keys                                                | 14 keys                                                |
| Protection class                  | IP 43                                                  | IP 43                                                  | IP 43                                                  | IP 43                                                  |
| Databases                         | 5                                                      | 5                                                      | 5                                                      | 5                                                      |
| USB-A (interchangeable)           | 2                                                      | 2                                                      | 2                                                      | 2                                                      |
| USB-B                             | 1                                                      | 1                                                      | 1                                                      | 1                                                      |
| RS 232                            | 2                                                      | 2                                                      | 2                                                      | 2                                                      |
| Wi-Fi® ****                       | 802.11 b/g/n                                           | 802.11 b/g/n                                           | 802.11 b/g/n                                           | 802.11 b/g/n                                           |
| Power supply                      | 12 ÷ 16 V DC                                           | 12 ÷ 16 V DC                                           | 12 ÷ 16 V DC                                           | 12 ÷ 16 V DC                                           |
| Power consumption                 | 3 W                                                    | 3 W                                                    | 3 W                                                    | 3 W                                                    |
| Operating temperature             | +10 ÷ +40 °C                                           | +10 ÷ +40 °C                                           | +10 ÷ +40 °C                                           | +10 ÷ +40 °C                                           |
| Atmospheric humidity*****         | 40% ÷ 80%                                              | 40% ÷ 80%                                              | 40% ÷ 80%                                              | 40% ÷ 80%                                              |
| Transport and storage temperature | -20 ÷ +50 °C                                           | -20 ÷ +50 °C                                           | -20 ÷ +50 °C                                           | -20 ÷ +50 °C                                           |
| Weighing pan dimensions           | ø 90 mm open-work<br>ø 85 mm standard<br>(option)***** | ø 90 mm open-work<br>ø 85 mm standard<br>(option)***** | ø 90 mm open-work<br>ø 85 mm standard<br>(option)***** | ø 90 mm open-work<br>ø 85 mm standard<br>(option)***** |
| Weighing chamber dimensions       | 190 × 190 × 222 mm                                     | 190 × 190 × 222 mm                                     | 190 × 190 × 222 mm                                     | 190 × 190 × 222 mm                                     |
| Weighing device dimensions        | 351 × 205.5 × 348 mm                                   | 351 × 205.5 × 348 mm                                   | 351 × 205.5 × 348 mm                                   | 351 × 205.5 × 348 mm                                   |
| Net weight                        | 7.3 kg                                                 | 7.3 kg                                                 | 7.3 kg                                                 | 7.3 kg                                                 |
| Gross weight                      | 9.3 kg                                                 | 9.3 kg                                                 | 9.3 kg                                                 | 9.3 kg                                                 |
| Packaging dimensions              | 495 × 400 × 515 mm                                     | 495 × 400 × 515 mm                                     | 495 × 400 × 515 mm                                     | 495 × 400 × 515 mm                                     |

\* repeatability is expressed as a standard deviation from 10 weighing cycles  
\*\* parameter determined in the following temperature range: +15 ÷ +35 °C  
\*\*\* stabilization time depends on external conditions and dynamics of placing loads on a pan, determined for FAST profile  
\*\*\*\* optional solution on purchase order  
\*\*\*\*\* non-condensing conditions  
\*\*\*\*\* ø 85 mm standard weighing pan on purchase order

Values of parameters provided in Technical Specifications table, have been determined under stable laboratory conditions. Due to ambient conditions impact or/and balance setup, the above parameters may vary for environments other than laboratory.

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Technical Specifications

|                                   | AS 110.R2 PLUS       | AS 160.R2 PLUS       | AS 220.R2 PLUS       | AS 310.R2 PLUS       |
|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| Maximum capacity [Max]            | 110 g                | 160 g                | 220 g                | 310 g                |
| Minimum load                      | 10 mg                | 10 mg                | 10 mg                | 10 mg                |
| Readability [d]                   | 0.1 mg               | 0.1 mg               | 0.1 mg               | 0.1 mg               |
| Verification scale interval [e]   | 1 mg                 | 1 mg                 | 1 mg                 | 1 mg                 |
| Tare range                        | −110 g               | −160 g               | −220 g               | −310 g               |
| Standard values                   |                      |                      |                      |                      |
| Repeatability(5% Max)*            | 0.06 mg              | 0.07mg               | 0.07 mg              | 0.08 mg              |
| Repeatability(Max)*               | 0.08 mg              | 0.08 mg              | 0.08 mg              | 0.12 mg              |
| Minimum weight (USP)              | 120 mg               | 140 mg               | 140 mg               | 160 mg               |
| Minimum weight (U=1%, k=2)        | 12 mg                | 14 mg                | 14 mg                | 16 mg                |
| Permissible values                |                      |                      |                      |                      |
| Repeatability(5% Max)*            | 0.09 mg              | 0.09 mg              | 0.09 mg              | 0.12 mg              |
| Repeatability(Max)*               | 0.1 mg               | 0.1 mg               | 0.1 mg               | 0.15 mg              |
| Linearity                         | ± 0.2 mg             | ± 0.2 mg             | ± 0.2 mg             | ± 0.2 mg             |
| Stabilization time***             | 2 s                  | 2 s                  | 2 s                  | 2.5 s                |
| Adjustment                        | internal             | internal             | internal             | internal             |
| Verification                      | Yes                  | Yes                  | Yes                  | Yes                  |
| OIML Class                        | I                    | I                    | I                    | I                    |
| Display                           | LCD (with backlight) | LCD (with backlight) | LCD (with backlight) | LCD (with backlight) |
| Keypad                            | 14 keys              | 14 keys              | 14 keys              | 14 keys              |
| Protection class                  | IP 43                | IP 43                | IP 43                | IP 43                |
| Databases                         | 5                    | 5                    | 5                    | 5                    |
| USB-A (interchangeable)           | 2                    | 2                    | 2                    | 2                    |
| USB-B                             | 1                    | 1                    | 1                    | 1                    |
| RS 232                            | 2                    | 2                    | 2                    | 2                    |
| Wi-Fi® ****                       | 802.11 b/g/n         | 802.11 b/g/n         | 802.11 b/g/n         | 802.11 b/g/n         |
| Power supply                      | 12 ÷ 16 V DC         | 12 ÷ 16 V DC         | 12 ÷ 16 V DC         | 12 ÷ 16 V DC         |
| Power consumption                 | 3 W                  | 3 W                  | 3 W                  | 3 W                  |
| Operating temperature             | +10 ÷ +40 °C         | +10 ÷ +40 °C         | +10 ÷ +40 °C         | +10 ÷ +40 °C         |
| Atmospheric humidity*****         | 40 ÷ 80%             | 40 ÷ 80%             | 40 ÷ 80%             | 40 ÷ 80%             |
| Transport and storage temperature | −20 ÷ +50 °C         | −20 ÷ +50 °C         | −20 ÷ +50 °C         | −20 ÷ +50 °C         |
| Weighing pan dimensions           | ø 100 mm             | ø 100 mm             | ø 100 mm             | ø 100 mm             |
| Weighing chamber dimensions       | 190 × 190 × 226 mm   | 190 × 190 × 226 mm   | 190 × 190 × 226 mm   | 190 × 190 × 226 mm   |
| Weighing device dimensions        | 351 × 205,5 × 348 mm | 351 × 205,5 × 348 mm | 351 × 205,5 × 348 mm | 351 × 205,5 × 348 mm |
| Net weight                        | 7.3 kg               | 7.3 kg               | 7.3 kg               | 7.3 kg               |
| Gross weight                      | 9.3 kg               | 9.3 kg               | 9.3 kg               | 9.3 kg               |
| Packaging dimensions              | 495 × 400 × 515 mm   | 495 × 400 × 515 mm   | 495 × 400 × 515 mm   | 495 × 400 × 515 mm   |

\* repeatability is expressed as a standard deviation from 10 weighing cycles  
\*\* parameter determined in the following temperature range: +15 ÷ +35 °C  
\*\*\* Stabilization time depends on external conditions and dynamics of placing loads on a pan, determined for FAST profile  
\*\*\*\* optional solution on purchase order  
\*\*\*\*\* non-condensing conditions

Values of parameters provided in Technical Specifications table, have been determined under stable laboratory conditions. Due to ambient conditions impact or/and balance setup, the above parameters may vary for environments other than laboratory.  
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Technical Specifications

|                                   | AS 520.R2 PLUS       |
|-----------------------------------|----------------------|
| Maximum capacity [Max]            | 520 g                |
| Minimum load                      | —                    |
| Readability [d]                   | 0.1 mg               |
| Verification scale interval [e]   | —                    |
| Tare range                        | −520 g               |
| Standard values                   |                      |
| Repeatability(5% Max)*            | 0.08 mg              |
| Repeatability(Max)*               | 0.25 mg              |
| Minimum weight (USP)              | 160 mg               |
| Minimum weight (U=1%, k=2)        | 16 mg                |
| Permissible values                |                      |
| Repeatability(5% Max)*            | 0.12 mg              |
| Repeatability(Max)*               | 0.4 mg               |
| Linearity                         | ± 0.4 mg             |
| Stabilization time***             | 2.5 s                |
| Adjustment                        | internal             |
| Verification                      | —                    |
| OIML Class                        | —                    |
| Display                           | LCD (with backlight) |
| Keypad                            | 14 keys              |
| Protection class                  | IP 43                |
| Databases                         | 5                    |
| USB-A (interchangeable)           | 2                    |
| USB-B                             | 1                    |
| RS 232                            | 2                    |
| Wi-Fi® ****                       | 802.11 b/g/n         |
| Power supply                      | 12 ÷ 16 V DC         |
| Power consumption                 | 3 W                  |
| Operating temperature             | +10 ÷ +40 °C         |
| Atmospheric humidity*****         | 40 ÷ 80%             |
| Transport and storage temperature | −20 ÷ +50 °C         |
| Weighing pan dimensions           | ø 100 mm             |
| Weighing chamber dimensions       | 190 × 190 × 226 mm   |
| Weighing device dimensions        | 351 × 205,5 × 348 mm |
| Net weight                        | 7.3 kg               |
| Gross weight                      | 9.3 kg               |
| Packaging dimensions              | 495 × 400 × 515 mm   |

\* repeatability is expressed as a standard deviation from 10 weighing cycles  
\*\* parameter determined in the following temperature range: +15 ÷ +35 °C  
\*\*\* Stabilization time depends on external conditions and dynamics of placing loads on a pan, determined for FAST profile  
\*\*\*\* optional solution on purchase order  
\*\*\*\*\* non-condensing conditions  
Values of parameters provided in Technical Specifications table, have been determined under stable laboratory conditions. Due to ambient conditions impact or/and balance setup, the above parameters may vary for environments other than laboratory.  
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Technical Specifications

|                                   | AS 120.R1 PLUS       | AS 220.R1 PLUS       |
|-----------------------------------|----------------------|----------------------|
| Maximum capacity [Max]            | 120 g                | 220 g                |
| Minimum load                      | 10 mg                | 10 mg                |
| Readability [d]                   | 0.1 mg               | 0.1 mg               |
| Verification scale interval [e]   | 1 mg                 | 1 mg                 |
| Tare range                        | −120 g               | −220 g               |
| Standard values                   |                      |                      |
| Repeatability(5% Max)*            | 0.06 mg              | 0.07 mg              |
| Repeatability(Max)*               | 0.08 mg              | 0.08 mg              |
| Minimum weight (USP)              | 120 mg               | 140 mg               |
| Minimum weight (U=1%, k=2)        | 12 mg                | 14 mg                |
| Permissible values                |                      |                      |
| Repeatability(5% Max)*            | 0.09 mg              | 0.09 mg              |
| Repeatability(Max)*               | 0.1 mg               | 0.1 mg               |
| Linearity                         | ± 0.2 mg             | ± 0.2 mg             |
| Stabilization time***             | 2 s                  | 2 s                  |
| Adjustment                        | External             | External             |
| Verification                      | No                   | No                   |
| OIML Class                        | –                    | –                    |
| Display                           | LCD (with backlight) | LCD (with backlight) |
| Keypad                            | 14 keys              | 14 keys              |
| Protection class                  | IP 43                | IP 43                |
| Databases                         | 5                    | 5                    |
| USB-A (interchangeable)           | 2                    | 2                    |
| USB-B                             | 1                    | 1                    |
| RS 232                            | 2                    | 2                    |
| Wi-Fi® ****                       | 802.11 b/g/n         | 802.11 b/g/n         |
| Power supply                      | 12 ÷ 16 V DC         | 12 ÷ 16 V DC         |
| Power consumption                 | 3 W                  | 3 W                  |
| Operating temperature             | +10 ÷ +40 °C         | +10 ÷ +40 °C         |
| Atmospheric humidity*****         | 40% ÷ 80%            | 40 ÷ 80%             |
| Transport and storage temperature | −20 ÷ +50 °C         | −20 ÷ +50 °C         |
| Weighing pan dimensions           | ø 100 mm             | ø 100 mm             |
| Weighing chamber dimensions       | 190 × 190 × 222 mm   | 190 × 190 × 226 mm   |
| Weighing device dimensions        | 351 × 205.5 × 348 mm | 351 × 205.5 × 348 mm |
| Net weight                        | 7.3 kg               | 7.3 kg               |
| Gross weight                      | 9.3 kg               | 9.3 kg               |
| Packaging dimensions              | 495 × 400 × 515 mm   | 495 × 400 × 515 mm   |

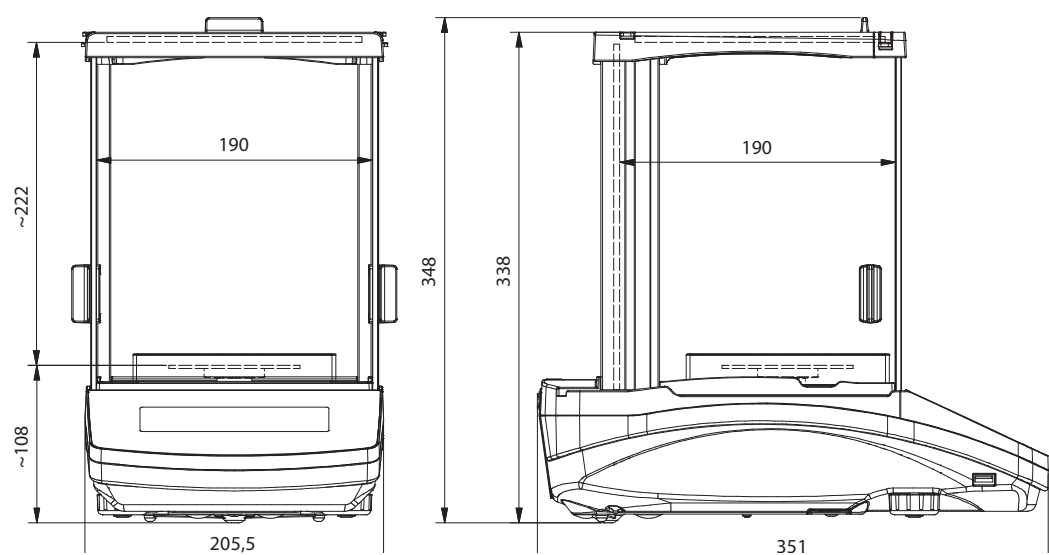
\* repeatability is expressed as a standard deviation from 10 weighing cycles  
\*\* parameter determined in the following temperature range: +15 ÷ +35 °C  
\*\*\* Stabilization time depends on external conditions and dynamics of placing loads on a pan, determined for FAST profile  
\*\*\*\* optional solution on purchase order  
\*\*\*\*\* non-condensing conditions

Values of parameters provided in Technical Specifications table, have been determined under stable laboratory conditions. Due to ambient conditions impact or/and balance setup, the above parameters may vary for environments other than laboratory.

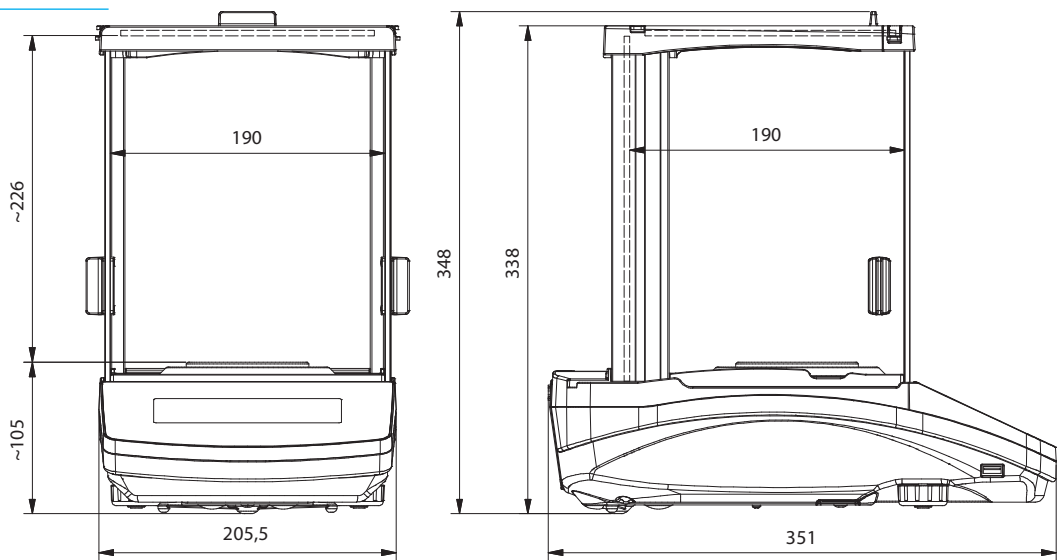
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# Dimensions



AS R2, d = 0.01 mg



AS R2, AS R1 d = 0.1 mg

## Accessories

### Weighing Tables

- granite antivibration table
- antivibration tables for laboratory balances
- professional weighing table

### Professional Weighing

- laboratory ware holders
- KIT 85 density determination kit
- under-hook weighing rack

### Ambient Conditions

- DJ-04 anti-static ioniser

### Peripheral Devices

- label printer
- receipt printer
- Epson dot matrix printer
- barcode scanners
- WD-6 LCD display

### Cables, Converters

- P0108: RS 232 cable (balance - computer)
- P0151: RS 232 cable (balance - Epson printer)
- USB cable type A-B
- AP2-1 power loop output

### Draft shields and anti-draft chambers

- protective cover for R series indicator

### Electrical accessories

- ZR-02 power supply with battery
- panel box

# Dedicated Software

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## R-LAB

- collecting measurements
- carrying out statistical analysis of measurements
- customized graphs and reports

## E2R Weighing Records

- complete, automated databases synchronization
- fully supported processes of labelling and parts counting
- record of weighings, weighings archiving
- basic and advanced (with graphs) reports

## Alibi Reader

- readout of data saved to Alibi memory
- export of data saved to Alibi memory
- data filtering and reports generating
- saving ALIBI database to CSV file

## RAD KEY

- Establishing cooperation between a weighing instrument and a computer

## R.Barcode

- The basic function software is presentation of the data sent by barcode scanners connected to PC via USB or RS232

## Radwag Development Studio

- presentation of functions (and subfunctions) of communication protocol (Common Communication Protocol)
- possibility of connection with weighing equipment on which each function is carried out,
- library with mass control, contained within the development environment
- complete documentation of the communication protocol
- set of user manuals for different solutions addressed for programmers employed in companies using RADWAG-manufactured weighing equipment

## RADWAG Connect

- establishing communication with all balances, scales and weighing modules using Common Communication Protocol
- communication via local network,
- support of basic functions
- auto searching for devices
- connecting with few devices simultaneously, swapping between them
- clear list of connected platforms
- record of measurements in the program,
- export of carried out measurements to CSV file,
- work performed using freely selected device with Windows 10 operating system

## LabView Driver

- operation of RADWAG balances in LabView environment

## R Panel

- operator access to all keys and functions that are to be found on an operation panel
- communication via COM1, COM2 or USB,
- compatible with: Windows Vista, 7, 8, 8.1, 10, Server 2008R2, 2012, 2016.