Checkweighers

INNOVATIVE TECHNOLOGIES FOR INDUSTRY

Functionality

POSSIBILITIES AND ADVANTAGES OF RADWAG CHECKWEIGHERS

ADVANCED FUNCTIONALITY AND POSSIBILITIES FOR ENSURING MAXIMUM BENEFITS

RADWAG checkweighers have been designed to meet the highest demands of users.

Not only do they ensure control and optimization of the production process but also minimise loss and provide significant cost reductions.

Electromagnetic weighing module

Belt conveyors

PGC: Packaged Goods Control

The highest weighing precision and mass control

- 0.01 g accuracy.
- Electromagnetic module developed by Radwag.
- Dedicated solutions for pharmaceutical industry.

Throughput and speed

- Shorter operating time - greater line productivity.
- Minimisation of production downtime.
- Economy - raw material loss reduction.
- Impressive operating speed achieved thanks to Radwag's innovative technology.

High quality

- IP67 protection rate.
- Materials: AISI 304 or AISI 316 steel.
- Quick assembly and installation.
- The maintenance and cleaning process of the mechanical parts is simple and fast.
- Components protected against adverse external conditions.

Vast range of functions

- Data control and protection.
- Customisation of the control type according to user demands.
- 100% control of products.
- Batching processes control via feedback.
- Alibi storage.
- Interfaces: Ethernet, Profibus, USB, Wi-Fi.
- Multilingual, intuitive menu of the device.
- Multi-product.

Control process management: E2R system

- Option of creating multi-workstation networks.
- Keeping records of data stored in scales.
- Exporting data to external systems.

Production safety

- HACCP - food industry attestation for direct contact with food products.
- Protection of out-of-tolerance products that have been rejected.
- Protection of the scale moving elements.
- Removal of metallic impurities with the use of metal detectors.

Accordance with the quality standards

- MID - directive on measuring instruments.
- OIML R51 - in accordance with the test procedures.
- HACCP - system of hazard and critical control points analysis.
- PGC - accordance with the legal requirements of Packaged Goods Regulation.
- GMP - Good Manufacturing Practice.
- FDA - guidelines of US Food and Drug Administration (CFR21).

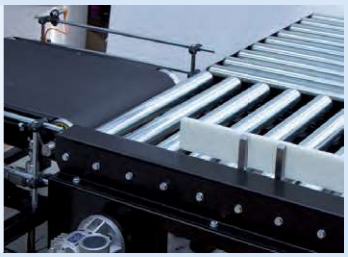
Modular construction

- Easily expandable.
- Light and sound signaling.
- individual selection of the discriminators and bins for out-of-tolerance products.
- Cooperation with metal detectors, label printers, bar code scanners, proximity card readers.

E2R system:
PC software
for process control
management

Pressure control
sensor

Line with belt
conveyors and
roller conveyors
with a pneumatic
rejecter



Open design,
offering simplicity
for maintenance
and cleaning

Metal and metallic
compounds detector

Vertical, flexible
system of side
guides used for
transporting bottles

Communication and Maintenance

SOFTWARE AND COMMUNICATION INTERFACE

WIDE RANGE OF CONFIGURATION OPTIONS AND USER OPTIONS TOGETHER WITH THE SIMPLICITY OF MAINTENANCE

Large touch screen and intuitive, user friendly menu ensure ease of operation and quick way of completing specific tasks.

Interfaces: Ethernet RS 232 USB

Communication interfaces ports of DWM scales

Communication interfaces ports of DWM scales

Configuration window of network connections

Ethernet

- Full data exchange.
- Sending weighing records, databases, scales settings; real-time monitoring of scales operation.
- Communication realized both: via the communication protocol and at SQL Server database level.

USB

- Cooperation with mass storage devices, external drives etc.
- Exporting batch reports and weighing data.
- Software updates.

RS 232

- Cooperation with peripheral devices:
  - label and receipt printers,
  - thermal and ink-jet printers,
  - bar code readers.

PLC Controller

- Exchange of both: binary data or analogue operating signals.

The main window of the program

- Clear screen layout.
- Various views of the displayed data, user-configurable.
- Intuitive menu.
- Process progress indicators.
- Quick access to statistical data.
- Report export and data export directly from the scales..

Operating modes

- Various operating modes and systems of reporting:
  - statistical mode,
  - dynamic mode,
  - CPG control (conformable to Packaged Goods Regulation),
  - CPG control in accordance with custom criteria,
  - measurements registration.

Configuration

- Quick adaptation of scales to working conditions.
- Easy setup of belt speeds with the use of scrollbars.
- Configurable parameters of products rejection, signalization and cooperation with other production line devices (e.g. batchers).

Diagnostics

- Automatic control of all the systems and scale elements.
- Continuous control from the start of the device.
- Recording all errors and breakdowns in the error log.
- Control of other production line devices, with alarming function in the case of production disturbance.

Operators control

- Defining operators access rights.
- Multiple levels of access control for selected functions, defined by administrator.

Database system

- Database based on SQL system.
- Easy configuration and data exchange with computer systems.
- Start-up configuration of the pre-defined data enables immediate device initiation.
- Quick access to configuration settings.
- Reliability and failure-free operation.

The main weighing window with signalisation of the thresholds and statistics

Settings window of signal inputs and outputs

Settings window of drives operation and conveyors speed

Configuration window of faulty products rejecters

Database window for śassortment preview and selection

Database window for editing selected products

Versatile Possibilities

CHECKWEIGHERS WITH ELECTROMAGNETIC WEIGHING MODULE

Mechanical options

- Central control system.
- Conveyor systems adjusted to the user needs.
- Design adapted to existing production lines.
- Various lengths and width of the conveyors.
- Stainless steel or powder coated mild steel design.
- Optional equipment: metal detectors, barcode scanners, video cameras, extra display etc.
- Ingress Protection rating – IP 65/67.

Products separation systems

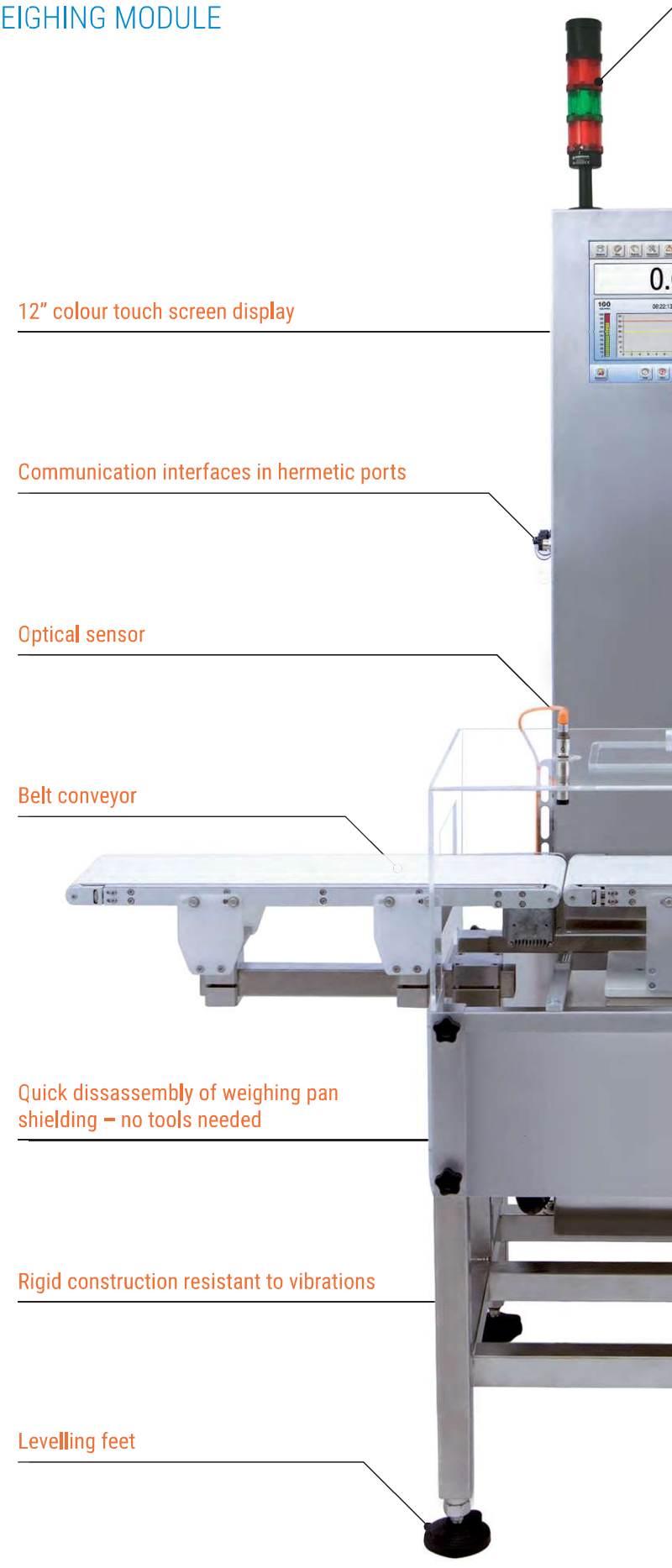
- Air-blast rejecter.
- Pneumatic pusher.
- Diverting arm.
- Drop belt rejecter.
- Production line stop.

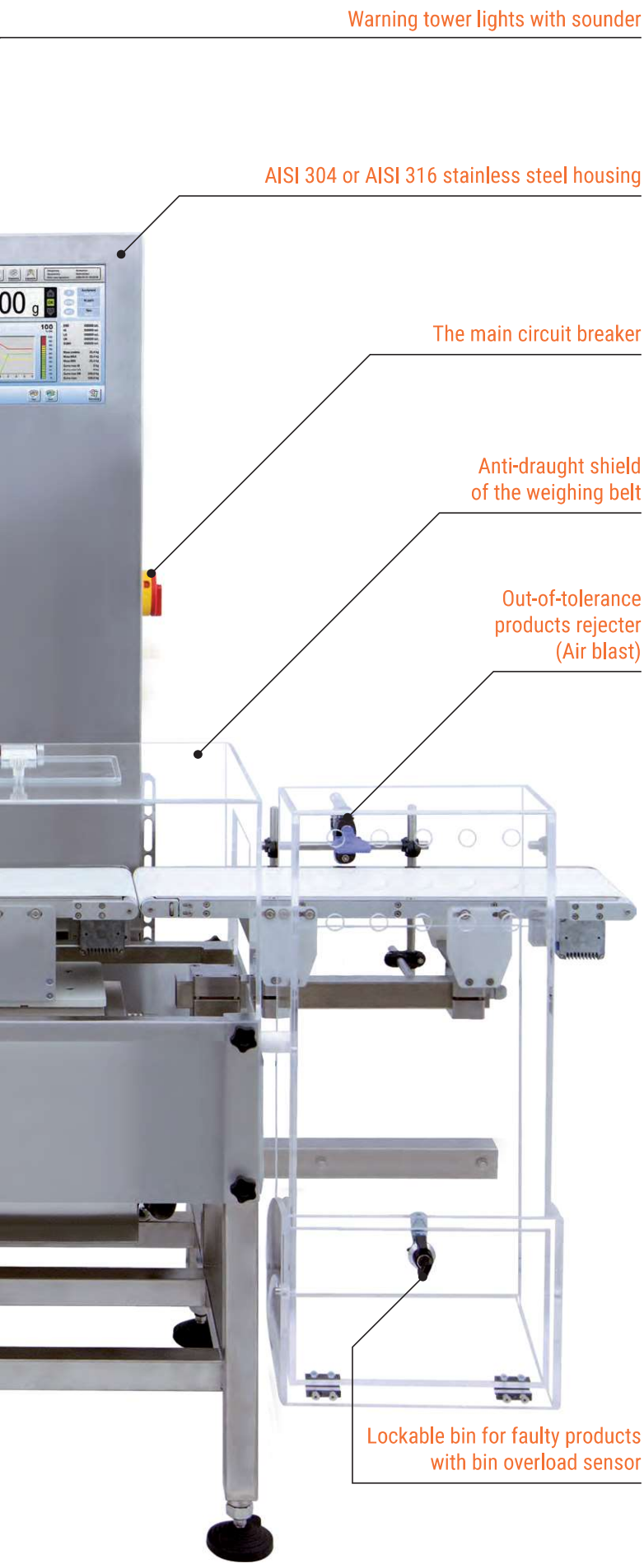
Communication

- USB mass storage devices.
- Implemented communication protocol.
- Cooperation with the thermal and ink-jet printer.
- Support for printers compatible with the Windows OS.
- Interfaces: Ethernet, USB, RS 232, optionally RS 422 and RS 485.
- Profibus DP.
- Data exchange at the SQL level.
- Extended I/O module.

Accesories

- Side guides.
- Transition plates between the conveyors.
- Slat band conveyors.
- Barcode readers support.
- Additional infeed conveyor systems
- Vertical speeding side guides.
- Table tops for rejected products.
- Storage bins.
- Roller conveyor tops.





Conformity with **MID Directive**
Tests in accordance with **OIML R51**

Control and safety systems

- Errors logging.
- Product flow control.
- Line productivity meter.
- Emergency power off system.
- Product rejection control.
- Breakdown signalisation output.
- Emergency stop input.
- Bin overload sensor.
- Downstream conveyor product jam sensor.
- Product length sensor.
- Products gap sensor.
- Servo motor position control.

Electrical options

- Faulty products stacklights.
- Mass range stacklights.
- Alarm and events audio signalling base.
- User conveyor control.
- Conveyors speed line regulation.
- Extra Inputs/Outputs.

Cooperation with the production line devices

- Communication with palletiser.
- Cooperation with batchers (settings error correction mode).
- Emergency line stop upon detection of faulty products.

Extra functions

- Extended statistical system.
- Reporting module.
- Extended PGC module.
- The product average mass control.
- Cooperation with E2R computer system.
- Complete auto diagnostics.
- Production line operation control.

Custom Made Design

INTENDED FOR PHARMACEUTICAL INDUSTRY

DWM

DYNAMIC SCALES WITH AN ELECTROMAGNETIC WEIGHING MODULE

The highest standard of manufacturing.
Unprecedented weighing speed and weighing accuracy!

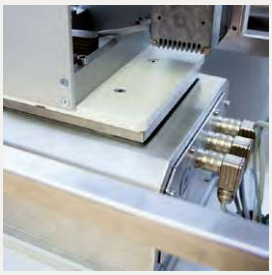
The scales are intended to control single loads of mass up to 7,5 kg. the scales are based on an industrial computer, and they are equipped with 12" colour touch screen.

Electromagnetic module provides extremely fast and accurate mass measurement.

Conformity with MID Directive
Tests in accordance with OIML R51

Specification

Throughput:	up to 500 items/minute
Weighing accuracy [d]:	0.01 g
Verification scale interval [e]:	0.1 g
Weighing range:	2 – 7500 g
Weighing module:	electromagnetic
Screen:	12" colour touch-screen
Operating system:	Windows XP Embedded
Database system:	SQL Server



Electromagnetic weighing module

Air blast rejecter

Ports (Ethernet, USB, RS 232)

Areas of use

- Packaged goods control.
- Complete 100% production process control.
- Production waste minimisation.
- Batchers control.
- Weighing of medical products, blisters, syrups etc.
- Inspection of production packaging.

Characteristics

- Type approval conformable to MID directive.
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design.
- Food industry attestation for direct contact with food products.
- Possibility of seamless integration of the checkweigher into existing production lines.
- Open construction, easy maintenance and cleaning.
- Wiring system designed inside conveyor frames.
- Quick disassembly of weighing pan shielding.
- Anti-draught shielding of the weighing belt (in accordance with industrial safety regulations).
- Lockable storage bin (conformable to HACCP).
- Extra conveyor systems for optimal product distribution.
- Static side guides system and mechanically driven guides system.
- Pressure control, line jam sensor and bin overload sensor.
- Complete system of auto diagnostics.
- Continuous control of all scales systems.
- Online monitoring of the technological process.

DWT/HL

DYNAMIC SCALES WITH STRAIN GAUGE TRANSDUCER

The scales are intended for controlling single loads of mass up to 7,5 kg. the scales are based on the industrial computer, and they are equipped with 12” colour touch screen.

Load cell is a lower cost alternative of an electromagnetic system.

Conformity with **MID** Directive
Tests in accordance with **OIML R51**

Specification

Throughput:	up to 180 items/minute
Weighing accuracy [d]:	0.2 g
Verification scale interval [e]:	0.2 g
Weighing range:	max 7500 g
Weighing module:	strain gauge
Screen:	12” colour touch-screen
Operating system:	Windows XP Embedded
Database system:	SQL Server


Strain gauge transducer


Compressed air service units


Lockable bin for the rejected products

Areas of use

- Packaged goods control.
- Complete 100% production process control.
- Production waste minimisation.
- Batchers control.
- Weighing of medical products, blisters, syrups etc.
- Inspection of production packaging.

Characteristics

- Type approval conformable to MID directive.
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design.
- Food industry attestation for direct contact with food products.
- Possibility of complete integration of the checkweigher into existing production lines.
- Open construction, easy maintenance and cleaning.
- Quick disassembly of weighing pan shielding.
- DWT/HL scales are lower cost alternative to DWM scales based on electromagnetic module, offering complete functionality for production lines where lower accuracy and weighing capacity is required.
- Weighing system is designed with the use of load cells and dedicated module for signal processing.

Universal Solutions

FOR WEIGHING PACKAGED PRODUCTS

DWT/RC

DYNAMIC SCALES INTENDED FOR LARGE-SIZED PRODUCTS

The scales are intended for controlling loads of mass up to 60 kg. The scales are based on the industrial computer, and they are equipped with 12” colour touch screen.

Checkweighers DWT/RC series are autonomous stations controlling mass of packages moving down the conveyor lines.

Conformity with **MID** Directive
Tests in accordance with **OIML R51**

Specification

Throughput:	up to 100 items/minute
Weighing accuracy [d]:	5 g
Weighing range:	max 60 kg
Weighing module:	strain gauge
Screen:	12” colour touch-screen
Operating system:	Windows XP Embedded
Database system:	SQL Server

Strain gauge transducer

Pneumatic rejecter

Quick coupling allowing easy detachment of conveyors

Areas of use

- Weighing of packaged products: sacks, boxes, multi-packs etc.
- The scales are intended for any kind of packaging lines and for the fishing industry fishing industry as well as the meat processing industry.
- Marking packages with the use of the ink-jet printers and labelling machines.
- Packaged Goods Control.
- Complete production process control.
- Batchers control.

Characteristics

- Type approval conformable to MID directive.
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design or powder coated mild steel design.
- Food industry attestation for direct contact with food products.
- Automatic sequencing of products gaps.
- Automatic identification of products with the use of bar code scanners.
- Cooperation with metal detectors.
- Light and sound signaling.
- Batchers operation control.
- Roller belt conveyors, modular belts.
- Open construction, easy maintenance and cleaning.
- Motor drive options: electric drum motors or motoreducers.

DWT/RC

DYNAMIC SCALES INTENDED FOR LARGE-SIZED PRODUCTS

The scales are intended for controlling loads of mass up to 60 kg, mostly packaged products.

Checkweighers DWT/RC series are single conveyor scales, intended for recording the weight of transported loads through cooperation with peripheral devices.

Specification

Throughput:	up to 100 items/minute
Weighing accuracy [d]:	5 g
Weighing range:	max 60 kg
Weighing module:	strain gauge
Screen:	12" or 5.7" colour touch-screen
Operating system:	Windows CE or XP Embedded
Database system:	SQL Server


Warning tower lights with a sounder


Belt conveyor


The main circuit breaker

Areas of use

- Cheese production lines.
- Meat processing lines.
- Integrated identification systems of mass and volume measurement in sorting lines of courier packages.
- Packaged Goods Control.
- Complete 100% production process control.
- Inspection of production packaging.

Characteristics

- Type approval conformable to MID directive.
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design or powder coated mild steel design.
- Automatic identification of products with the use of bar code scanners.
- Cooperation with the palletisers.
- Light and sound signaling.
- Batchers operation control.
- Roller belt conveyors, modular belts.
- Motor drive options: electric drum motors or motoreducers.
- Possibility of connection to the external safety systems.

Custom Made Solutions

FOR WEIGHING SPECIFIC PRODUCTS IN VARIOUS BRANCHES OF INDUSTRY

DWR

ROTATIONAL SCALES FOR CYLINDRICAL PRODUCTS

The scales are intended for controlling single loads of cylindrical items (jars, tubes, sprays, aerosols, bottles).

The checkweigher construction makes it a perfect solution for all the products with a small diameter of the base and a high centre of gravity.

Conformity with MID Directive
Tests in accordance with OIML R51

DWT/HL C

AUTOMATIC SCALES FOR THE CONFECTIONERY INDUSTRY

The scales are mostly intended for weighing wafers.

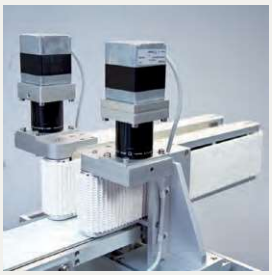
Special construction, where the weighing module is mounted over the conveyor line, keeps it clean (wafer, toppings and cream leftovers fall into the container placed under the conveyor).

Metal detection

Installation of the tunnel metal detector allows detection of any impurities in the weighed products.

Metal and metal compounds detection is carried out, in motion, therefore, there is no need for stopping the conveyor belt. the report on the detector operation and the weighing report on the product series are combined.

Rotational feeder of cylindrical products

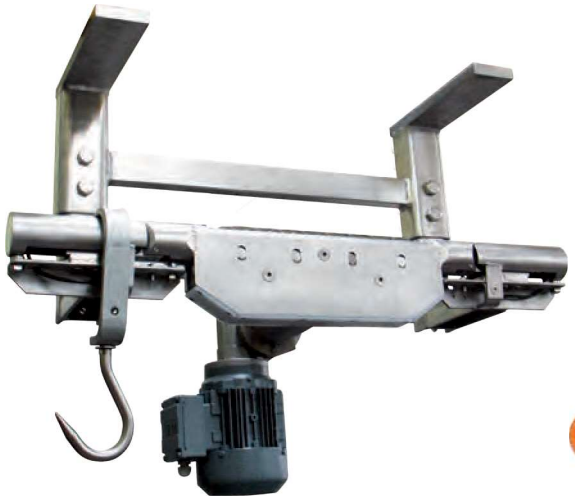


Side guides system for transporting bottles

Tunnel metal detector

Characteristics

- Type approval conformable to MID directive.
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design.
- Food industry attestation for direct contact with food products.
- Possibility of complete integration of the checkweigher into existing production lines.
- Custom-designed for a given product specification.
- Various systems of rejection.
- Quick disassembly of weighing pan shielding.
- Extra conveyor systems for optimal product distribution.
- Static side guides system and mechanically driven guides system.
- Pressure control, line jam sensor and bin overload sensor.
- Complete system of auto diagnostics.
- Continuous control of all scales systems.
- On-line monitoring of the technological process.



Conformity with **MID** Directive
Tests in accordance with **OIML R51**

DWT/RC K

AUTOMATIC OVERHEAD TRACK SCALES

Scales intended for the meat processing industry, they are used for processed animal products transport and weighing (carcass, half carcass, poultry etc.).

Special construction was designed to fit in the tracks of transport rails. the scales allows for unattended weighing in motion, without the need to stop the conveyor.

DWT/RC R

AUTOMATIC CONVEYOR SCALES

The scales are intended to control any type of large loads, mostly palletized products.

Wide range range of applications allows for the scales operation in numerous branches of industry.

Double-track scales

- The scales are intended for cooperation with a double-track batching and packing devices.
- Combination of two measuring systems in one construction allows for a close distance between the scales tracks, which not only makes the product distribution from the batching systems simple but also requires little space for the device.

Conveyor side guides

Stainless steel rejected products bin

Open construction, simplicity of maintenance and cleaning

Characteristics

- Type approval conformable to MID directive.
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design.
- Food industry attestation for direct contact with food products.
- Possibility of complete integration of the checkweigher into existing production.
- Extra conveyor systems for optimal product distribution.
- Complete system of auto-diagnostics.
- Continuous control of the scales systems.
- On-line monitoring of the technological process.

Software

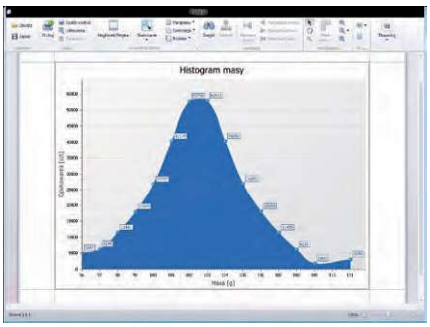
EXTENDED FUNCTIONALITY OF CHECKWEIGHERS

E2R Checkweighers

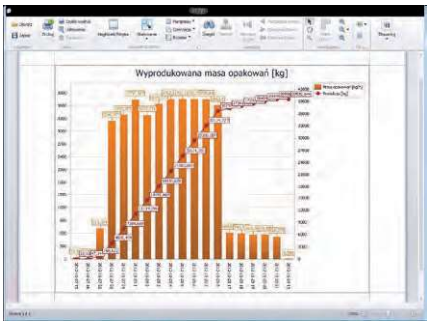
ADVANCED SOFTWARE MODULE OF E2R PRODUCTION MANAGEMENT SYSTEM

E2R system not only lowers the real cost of production and maintenance but also provides production process optimization.

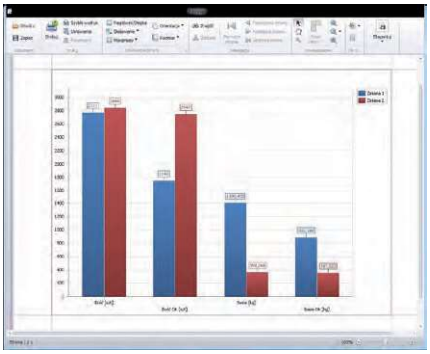
Numerous functions such as database synchronization, scales online status preview, storing measure-ments and advanced static reports of production process are available within one application only.



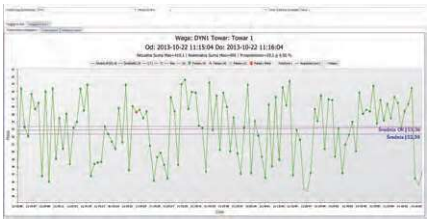
Mass histogram



Production report provided in weight units



Shift reporting of the production process



Linear weight diagram processed in real-time

Production efficiency coefficient preview

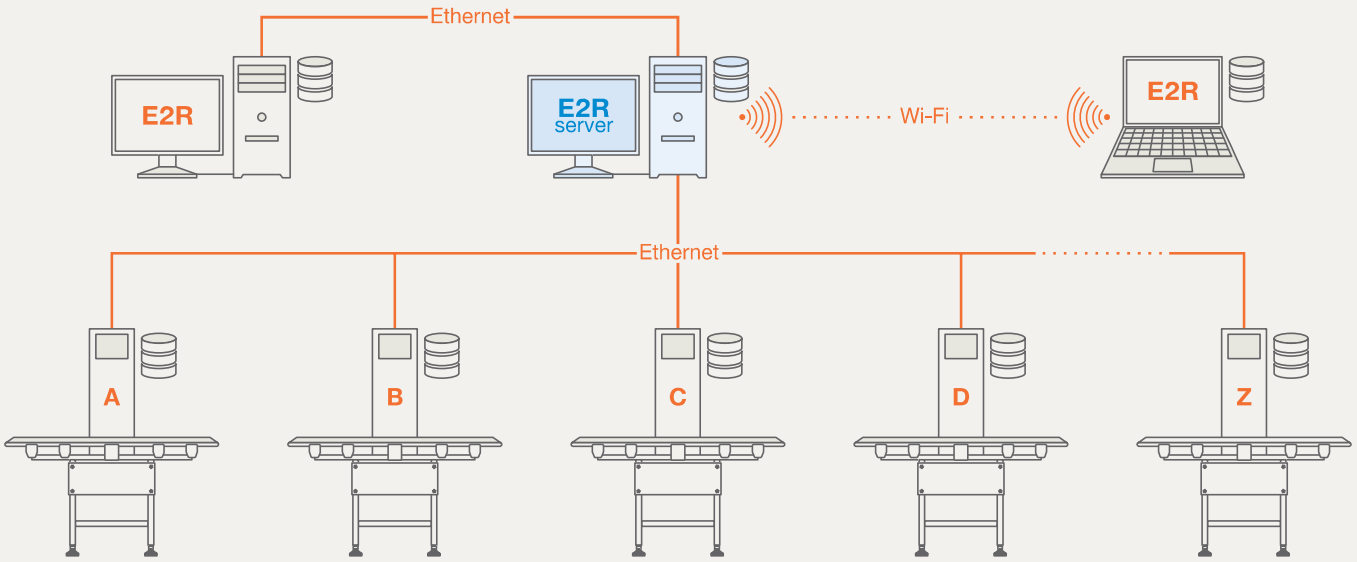
Specification

E2R Checkweighers is one of the modules within multifunctional E2R database computer sys-tem, which operates with any RADWAG scales. the module is intended for cooperation with RADWAG checkweighers. It communicates over Ethernet and is based on the SQL database.

Characteristics

- Real-time monitoring of multiple checkweighers in operation:
  - weight diagrams: linear, histogram, bargraph,
  - diagrams on quantity of items, efficiency diagrams,
  - current measurement readout and checkweigher settings.
- Adding, deleting and editing records:
  - for products,
  - for operators.
- Assigning the products to checkweighers.
- Defining access levels for multiple users.
- Storing weighments.
- Operation on a vast amount of data in a real time.
- Recorded weighments filtration according to:
  - operator name,
  - product batch,
  - product name,
  - weighing date,
  - net mass,
  - tare,
  - status.
- The sum of filtered weighments in the form of:
  - processed weighments sum,
  - processed weighments quantity,
  - average of processed weighments,
  - minimal measured mass,
  - maximal measured mass.
- Access to reports sent from the scales:
  - PGC report in accordance with legal regulations,
  - PGC report in accordance with custom criteria,
  - statistics report,
  - changeable products weighing report.
- Generating the recorded reports of:
  - average mass weighments with the overflow,
  - shift weighments,
  - hourly production weighments,
  - device effectiveness indicator (availability, efficiency, quality),
  - total production,
  - operating time, brakes and the scales status,
  - products metal impurity.
- Reports export to files:
  - PDF, HTML, MHT, RTF, XLS, CSV, TXT.

Functional scheme of the system



E2R system consists of:

- database server, where the management software is located,
- checkweighers operating in the production lines,
- ethernet network connecting the weighing workstations with the database server,
- clients workstations enabling both; a current preview of system operation and database edition.

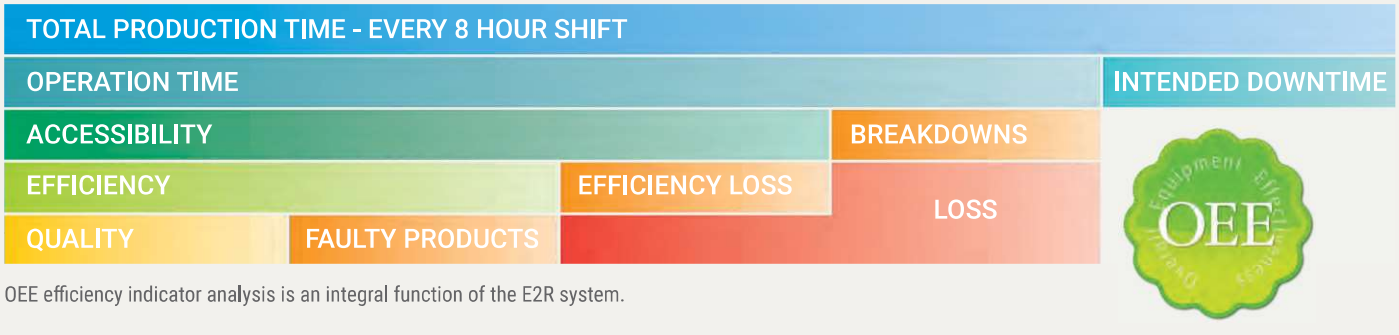
E2R Checkweighers module ensures:

- continuous control of checkweighers via computer network,
- option of wireless communication with the scales and their databases.

Characteristics

- **Extended reporting module** generated in accordance with legal regulations or the custom criteria.
- **Production process administration** through acquiring information on operational time, intended or unitended downtimes, production quality indicators, temporary line productivity etc.
- **On-line control of the production process** through the current access to:
  - weighing workstation on-line preview,
  - currently processed weighment diagram,
  - production bargraph,
  - normal (Gaussian) distribution,
  - throughput diagrams and analytical samples correctness diagrams.
- **Simple edition of databases** at the server level or at the level of any operating scales connected to the system.
- **Data compatibility** of all the system elements, provided by an option of automatic database updates.
- **Production process optimization** through the OEE efficiency indicator analysis and through the information about the line efficiency and production quality.
- **Data security ensured** thanks to:
  - authorized access to the server system and the checkweighers,
  - databases backup option.
- **Reliability of operation**:
  - reliable data storage system, allowing autonomous scales operation even during network or database server breakdowns,
  - scales real-time status preview, allowing for instant system failure detection.
- **Flexibility**:
  - Possibility of quick modification of both; the program interface and the reports layouts.
- **Scalability**:
  - simple modification of the system and expanding it with new weighing workstations without any necessity for stopping measurement recording,
  - possibility of numerous computer workstation connection within the system.

OEE efficiency indicator analysis



OEE efficiency indicator analysis is an integral function of the E2R system.

Validation

RADWAG OFFERS SUPPORT in VALIDATION OF CHECKWEIGHERS and WEIGHING SYSTEMS

The validation guarantees that the measurements errors will be within the defined criteria and that the scales will meet the expectations.

One of the validation processes is complete qualification:

REQUIREMENTS

VALIDATION

PQ PROJECT QUALIFICATION

Validation process is recommended by the Good Manufacturing Practice principles.

IQ INSTALLATION QUALIFICATION → OQ OPERATION QUALIFICATION → PQ PROCESS QUALIFICATION

Technical Specification

Model	Max. capacity	Readability	Conveyor velocity	Protection class
Multi-Track DWM H2	750 ÷ 7500 g	0.1 ÷ 5 g	1.6 m/s	IP 55, IP 65
DWM HPE	1500 ÷ 7500 g	0.5 ÷ 5 g	1.6 m/s	-
DWM HPS	1500 ÷ 6000 g	0.5 ÷ 2 g	2.5 m/s	IP 65
DWM HPX	1500 ÷ 6000 g	1 ÷ 2 g	1.6 m/s	IP 69K
DWM	750 ÷ 7500 g	0.1 ÷ 1 g	1.6 m/s	IP 55, IP 65
DWR 1500 H1	600 ÷ 7500 g	0.2 ÷ 5 g	Capacity max 80 pcs/min	IP 55, IP 65
DWR 1500 H2	600 ÷ 7500 g	0.2 ÷ 5 g	Capacity max 160 pcs/min	IP 55, IP 65
DWT/HL HP	300 ÷ 6000 g	0.2 ÷ 2 g	1 m/s	-
DWT/HL/HPC	1500 ÷ 3000 g	1 ÷ 2 g	Capacity max 60 pcs/min	IP 55
DWT/RC	30 ÷ 75 kg	10 ÷ 50 g	1.7 m/s	IP 55/65
DWT/RC R	300 ÷ 6000 kg	0.1 ÷ 2 kg	0.5 m/s	IP 55/56

Installation of checkweigher based on implementation arrangements

What dimensions should your device have? What kind of products will you weigh on it? A scale configured in what way do you need? What conditions of operation will you provide for it? What devices, additional functions and interfaces should it have? How about accuracy? **Do you have special requests not covered above?**

Checkweigher is a personalized device. Before we design and manufacture it specifically for your order, we need to know what you expect from it. Among other things, we will ask you about the height of the weighing platform, the speed of the conveyor behind and in front of the scale, and the minimum distance between goods. Whether your product will be transported in regular gaps and what properties and form it has. Whether you need a verified scale, what it should be made of and how you would like it to be cleaned. Whether it will be used in a clean conditions or one with high moisture or high dustiness. Do you need a metal detector, a separation goods sensor, a feedback function to the batcher? A communication port, Ethernet, USB?

The list of possibilities we give you when implementing a checkweigher is endless.