



SOLUTIONS FOR THE READY MIXED CONCRETE INDUSTRIES

www.protemgroup.com



PROTEM



PROTEM
group

**SOLUTIONS FOR THE BUILDING
MATERIALS INDUSTRY**



Company History

- **Founded in 1989**

- **Markets:** Ready Mixed Concrete, Pre Cast Concrete Products, Asphalt Mix, Dry Mortar, Quarries

- **Headquarters / Factory:** in Ano Liosia, Athens, Greece,

- **Philosophy of developing:** innovative solutions and products to help our customers achieve their business goals.

Time Line

1989: Company "G. Panagiotidis – D. Tselepis Co" is founded with the distinctive title "PROTEM Electronics".

1991: Development of the first automation control system for a Ready Mixed Concrete Plant • Penetration on other construction materials industrial sectors.

1995: PROTEM Electronics starts developing software applications

2000 • PROTEM Information Systems is founded with the scope of developing, sell, implement software solutions mostly dedicated to the construction materials industries

- **PROTEM Electronics is certified with ISO 9001.**

2001: PROTEM Machinery is founded with the scope of manufacturing, sell, install and support Ready Mixed Concrete Plants, as well as equipment / projects for other construction materials sectors • PROTEM GROUP (PROTEM Electronics, PROTEM Information, Systems and PROTEM Machinery) is now able to offer complete turn-key solutions.

2005: PROTEM Machinery penetrates the Greek aluminium recycling market by installing the first shredding line with its collaborators from EU.

2007: Merge of the three companies of the GROUP under the new name "PROTEM GROUP S.A."

- Strategic decision to target Foreign markets.

2008: Installations in Bulgaria & Romania • 250+ Customers mark

2010: PROTEM GROUP S.A. moves to new premises • New Installations in Egypt.

2011: New Installations in Albania.

2012: New Installations in West Africa.

2013 - 2014 - 2015 - 2016 - 2017: New installations worldwide

Achievements, where do we stand today

PROTEM managed to be established as leader in the Greek market within the first few years of its operations.

We did that by securing the quality of our products and services as well as of our internal operations. We never stopped to improve our products and services and we focus on customer satisfaction offering best-in-class support.

However, what we consider to be our greatest achievement is that we managed to convince the demanding Greek companies that a Greek company has developed state of the art technology and solutions. This achievement allows us to address new markets outside Greece, knowing that we can compete and win over other competitors worldwide.

In the area of software development PROTEM has significant achievements. We have developed the most specialized Enterprise Resource Planning (ERP) System for the Ready Mixed Concrete Industry.

Finally, our factory is able to deliver high quality batching plants for Ready Mixed Concrete and pre cast concrete products industries.



ISO Certifications



Q-CERT

ΠΙΣΤΟΠΟΙΗΤΙΚΟ/CERTIFICATE

QMSCERT, an accredited provider of third-party system certification organization for ISO 14001 environmental management systems and acting in accordance with the requirements of ISO 17021 for registrars attests that:

PROTEM GROUP S.A.

3, 35TH STR., INDUSTRIAL PARK (VIO.PA),
13341 ANO LIOSSIA, ATTICA-GREECE

with a scope of:

*Design, Manufacturing, Project Management & Technical Support
of Construction Materials Plants. Software Design, Development,
Support & Integrated Information Systems.*

has established an environmental management system that is in conformance with the
International Standard

EN ISO 14001:2004

September 14th, 2018

Certification Period Ending

December 29th, 2015

Initial Certification Date

December 29th, 2015

Certification Date

NACE code: 33.12, 42.99, 62,
71.1, 72.1

For the QMSCERT Board

This certification is subject to Annual Surveillance Audits. The certification is valid (for three years) only if it is followed by the annual surveillance audits approval.

For information concerning the validity of the certificate, you can visit the site www.qmscert.com



QMSCERT® N. 291215-5

MS Certification
Cert. No. 110-3

QMSCERT 26th OCTOBER Str. 90 - GR 546 27 - THESSALONIKI - HELLAS

SOLUTIONS FOR THE READY MIXED CONCRETE INDUSTRY

Intelligent RMC batching - Hardware & Software - Upgrading and Retrofitting of existing plants

PROTEM GROUP S.A. offers integrated solutions for the building materials industry.

Our extensive 30 years know-how of each industry's challenges, our innovative technological systems and our premium customer support enables us to offer fast ROI to our customers.

Our solutions enable best practice in the building industry.

PROTEM is certified with ISO 9001 and ISO 14001 PROTEM and has successfully collaborated with more than 250 companies in Greece and EMEA.



*Solutions
strengths*

Our products use intelligent hardware and software in order to decrease:

- Production idle times
- Dependence on operators
- Errors

Thus, increasing production capacity and output.



Processes

PROTEM helps companies to optimize their operational efficiency by streamlining their processes resulting in:

- Increased operational productivity
- Reduced time to market
- Facilitates information flow
- Improved product quality
- Reduced total product cost
- Reduced total operational cost

Service and Support

- Process analysis & optimization
- Assessment and implementation services to deploy technology and minimize production disruption
- Global maintenance support that provides the right team, tools and technology available on demand



PROTEM has three main divisions Mechanical, Automation and Software and provides a one-stop-shop solution to customers.

1. Ready Mix Concrete or Precast Batching Plant Mechanical Design

We design and implement standard and tailor-made types of RMC plants and precast industry products. We supply integrated solutions to RMC plants of 80-100 m³/h both fixed and containerized batching plants for precast applications taking into account existing equipment, available space, number of mixers, feeding automation required and all other customer needs.



2- Ready Mix Concrete, precast batching Plants - asphalt plants - quarry automations, weighing automation and industrial weighing solutions

Our large variety of automation solutions enables us to provide our customers' with unique product features and solutions using the latest technologies. All of our automation solutions are produced in-house and rigorously tested to achieve top quality technological control.

All our automation solutions are supplied with control and power panels.



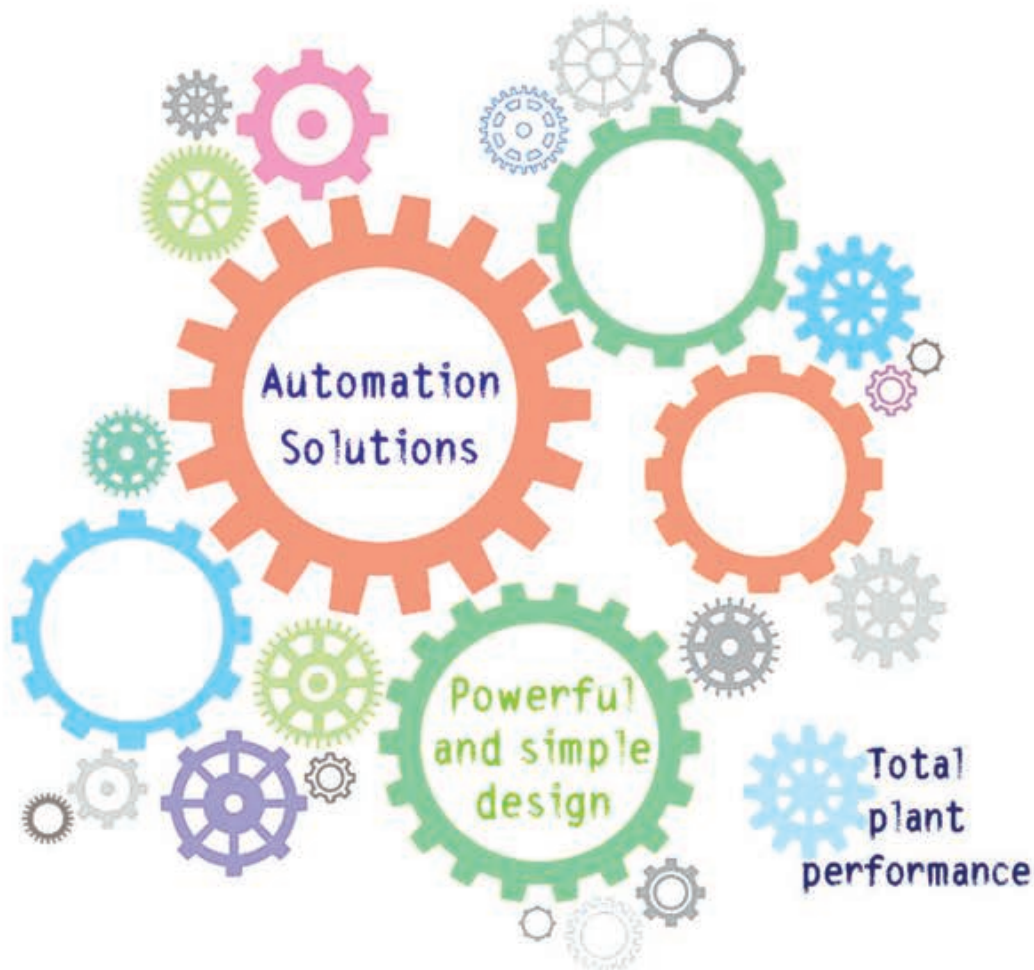
3. Ready Mix Concrete or precast batching Plant ERP and industrial weighing integrated solutions

Our unique integrated ERP software for the RMC and cement industry gives plant managers online access to all activities and daily financial reports.

A central real-time database streamlines all processes resulting in optimum efficiency, elimination of errors and controlled transactions.



SCADA AUTOMATION SYSTEM FOR NEW
OR RETROFIT TO EXISTING PLANTS



We supply a range of automation solutions
for new or retrofit existing plants
Our automation solutions integrated all our
customers needs in RMC batching process

PROTEM® AUTO-LEADER NG



To cover even the most demanding requirements of a modern Ready Mixed Concrete Industry PROTEM has created the ultimate batching control system. PROTEM® AUTO-LEADER NG is the market's leading automation system for the control, supervision and management of Ready Mixed Concrete production. It's a result of 28 years of PROTEM's experience in implementing automation control systems in Ready Mixed Concrete Plants. The system offers the optimal solution to every automated Ready Mixed Concrete production requirement. The system's design, architecture and customization flexibility, facilitates its use in all ready mixed concrete batching plants. The system consists of the Electronic Control Board and the Production Control Board, supervision, management and administration software.



This simple and powerful system maximizes total plant performance and is easily operated. The system monitors and controls the production cycle from materials weighing and dosing till through to mixer truck loading and automatic batch report printing. Auto leaders NG is designed to maximize performance in every RMC Batching plant regardless of size and configuration

Product Features

The system supports:

- Unrestricted number of common raw materials can be included in the mix design (recipe). The system supports as many aggregates and cement qualities (silos) needed (e.g. 10 aggregates, 8 cements)
- Up to 15 chemical additives (admixtures) which can be weighed to 1 or 2 different scales (One of the scales can be for additives with very fine dosing e.g. air entrainer liquid additive)
- Use of metal or synthetic fibers using any weighing-dosing method (subtractive or additive)
- Color usage in the recipe which can be dosed using a dedicated color scale
- Ice, cold or hot water on the same or on separate scales

Moisture meters can be connected to any aggregate material needed. The system automates moisture compensation and accurately manages the water and material quantities used. Calibration of the moisture meters is simplified and one of the key advantages of the system. Quality Control is simplified as moisture content of the aggregate samples is measured in the lab and then input to the automated system.

Additional Features

- Full compliance with European Union Ready Mixed Concrete Production Standards EN206-1
- Simple and easy to use
- Accurate & Optimum Production performance
- Fully Integrated with PROTEM's Software Betolink® Pro (Ready Mixed Concrete Production Management, Dispatching & Ticketing Software)
- Detailed Production Reporting
- Raw Materials depot management
- User Rights Management, Data & Settings security control
- Fast and easy installation and training

PROTEM® AUTO-LEADER 3000 PROFIT



Auto Leader 3000 Profit is an ergonomically designed state of the art automation console type control system, characterized by ease of use and operational independence from other peripheral devices, ensuring an uninterrupted production process.

Product Features

- Non PC based system
- Manufactured solely with industrial electronics
- Small yet extremely powerful console (53cm x 40cm), capable of controlling a whole plant
- Fully protected from network overload, lightning, generator's voltage abnormalities
- Records manual interventions
- Prints full production statistical reports
- Operates in extreme temperatures and humidity etc.
- Fully integrated with scheduling & dispatching software (Betolink® Pro)
- Alarm system monitors mixer conditions (overload protection, oil levels, temperatures) safeguarding operations
- Automatic slump monitoring and recording system

PROTEM / AUTO-LEADER 3000P_ECO

Auto-Leader 3000P_ECO is our latest cost effective product for the control supervision and management of the Ready Mixed Concrete production. We have concentrated all of our experience and know-how into a small package, containing the critical components, which can be connected to existing electric boards resulting in operational and cost efficiency.

The system is comprised of:



1. Central processing unit with:

- 4 high precision weighing-batching controllers with high sample rate and calibration values (log file) memory. An internal calibrations witch that can be secured by a wire seal penetrating two drilled head screws
- 2 fiber optic bidirectional serial ports for printer and computer connection providing increased protection against voltage abnormalities and lightning
- 4 RS485 ports for communication with the PLC, power meter, humidity meters and remote service support

2. Betolink® SCADA software

Betolink® SCADA is used for supervising the production process and allows the operator to intervene manually. As the PC does not control the operations' sequence, operations are not interrupted by failure of the peripherals system, thus increasing overall reliability and safeguarding the production process.

3. PLC

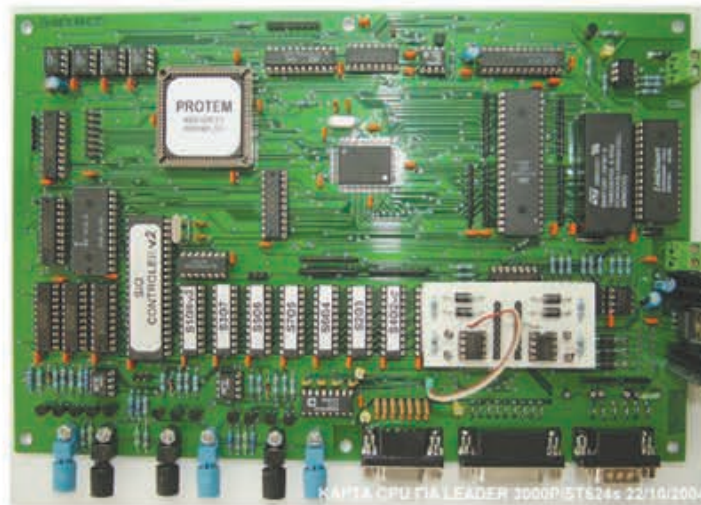
A PLC is connected through RS485 to the central CPU and acts as an I/O terminal. The PLC has built-in input and output cards which are connected to the external input/output modules through connector cables.

4. Two input and two output modules

The input output modules, designed to snap onto a standard DIN rail for installation on a wall mounted enclosure, protect and electrically isolate the PLC, simplifying the cabling process. Wiring connections are made using screw terminals positioned along the top and bottom, accessible from the front for easy installation and servicing. The total number of external I/O 32+ 32 can be expanded.

5. A power meter & power analyzer

A DIN rail-mounted power meter that provides all the measurement capabilities required to monitor the mixer. It communicates through RS 485 with the CPU.



6. A printer

A dot matrix A3 printer communicates through fiber optic cable with the CPU to print batch reports and statistics.

7. An implementation CD

Containing:

Betolink® SCADA installation program (including device drivers and plugins) user manual in printable pdf format Installation Manual in printable pdf format and Electrical Drawings in printable pdf format

BETOLINK ERP SOFTWARE

STEP BY STEP ADDED APPLICATIONS COMPRISING UNIFIED INTEGRATED SYSTEM COVERING:

PRODUCTION / SALES / LABORATORY / SERVICE STATION / FLEET AND FUEL MANAGEMENT /
ACCOUNTING DEPARTMENT / MANAGEMENT INFORMATION SYSTEM CONNECTION
TO EXISTING ERP SYSTEMS(SAP ETC)
Leasing Schemes available



Betolink® ERP

Betolink® ERP is the core of PROTEM's Ready Mix Concrete Production System™ (RMCPS) and is the most reliable highly specialized ERP System for the Ready Mixed Concrete Industry. It fulfills every requirement and addresses every challenge within the industry.

The features that differentiate Betolink® ERP from other ERP software are:

- 100% customized for the RMC Industry
- Integration with Batching Control Systems (bidirectional and on-line) and other hardware such as truck scale weight indicators, fuel pump controllers, GPS tracking devices and compression testing machines
- Streamlines all production processes minimizing costs and maximizing plant productivity
- User Friendly
- Top quality control management
- Fast and reliable implementation





Betolink® Pro Module 1 (basic)

Project, Mix Designs, Fleet Management.

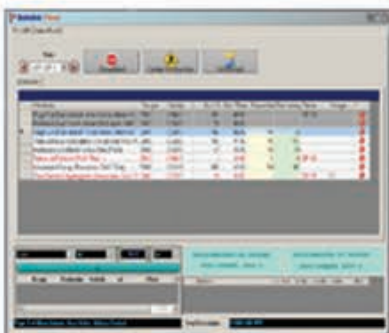
Connected with the batching automation system, the operator can load the vehicles and produce semi-automatic Ticketing.

Production data (Batch report) printed with the delivery note.

Daily production report.

Can be connected with other accounting software if **Betolink® Enterprise** isn't used.

Can be installed in each site. 5 Users/License



Betolink® Pro Module 2 (upgrade)

Daily Orders Management, Scheduling & Dispatching, Quotes,

Daily schedule for production execution, Fully automated Ticketing.

Interconnects with up to 4 batching plants automations simultaneously, enabling centralized daily program execution for companies with several plants in one location.

Step by step procedure wizards enabling scheduler to deal with re-routing, cancelation of delivery, returns etc.

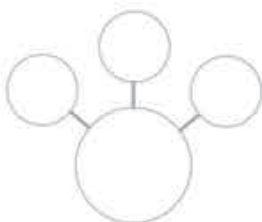


Betolink® Pro Module 3 (upgrade)

Production Reports & Statistics, Plant Inventory Monitoring & Consumption Reporting. Historical data with multiple search options.

Upgrade of Mix Design Management. Can be performed remotely with **Betolink® Laboratory** software.

Materials and cement inventory is automatically updated with all input transactions in connection with **Betolink® Weighing** Station Batching total weight of a load and the weight recorded by the truck scale are continually checked.



Betolink® Pro Module 4 (upgrade)

This module enables companies with multiple sites to centrally supervise production. Each plant has a database (its own BETOLINK PRO) and a central corporate database is synchronized with all the sites' databases.

It is a state of the art on-line integration technique using replication server technology. Production results of all sites are monitored in real time.

Orders are planned centrally and can be modified on-site, recipes are centrally updated. Every site can continue working autonomously even in the event of network failure and when connection is restored all data is automatically synchronized.



Betolink® Pro Module 6 (upgrade)

Scada software for remote production supervision and execution. Can be installed anywhere in the site. Interfaces with the AUTO-LEADER 3000 P_ECO automation through the LAN.



Betolink® Pro Module 7 (Betolink® GP-M.A.T.I.S.)

- Real-time monitoring of trucks' status (project, pouring, returning to plant, etc.)
- On-screen information for each project/truck according to daily schedule.
- Location tracking of each truck on digital map.
- Real-time information on delivery data parameters (time, waiting, poured quantities etc.) allowing informed decisions.
- Real time alarm in the event of: speed limit violation, route change, job feed rate delays.
- Data of previous orders (Mix designs delivered, quantities, time statistics per customer/project).

GPS receiver and other necessary hardware for the trucks are sold separately.

- Availability of historic data for previous orders (Mix designs delivered, quantities, time statistics per customer / project).

GPS receiver or other hardware that has to be installed on the trucks is sold separately.



Betolink® Pro - Bar code printing (Add-on)

Prints Bar Code Labels for the samples tested for quality (hardware is sold separately).

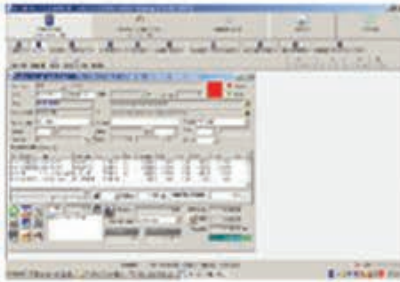
Betolink® Pro-Bar code printing has to be connected to Betolink® Laboratory.



Betolink® Enterprise Module 1 (Basic)

Sales Management, Project Management, Open Items, Warehouses Inventory Management, Receivables/Payables, Credit Control and Payment Methods, Purchasing, Reports, User Rights Management

Installed in Accounting department. 10 Users/License



Betolink® Enterprise Module 2 (upgrade)

Quotes, Pricing System, Agreements, Contracts, advanced Daily Schedule Management & Execution, Ticketing collection from Plants, Automated Invoicing Procedure and Extended Mix Design Management. Replication with Betolink® Pro database. Interfaces with Betolink® Weighing Station. All data necessary for invoicing is available from Betolink® Pro and only needs a 3 step automatic process.

Betolink® Enterprise Module 2.1 (add on)

Central Management of more than one site. When more than one batching plants exist in one site, the price does not change. Price is per remote site.



Betolink® Enterprise Module 3+4

Facilitates Accounting Department functions. Necessary upgrade for cost calculation. Cost Control Mechanism For costing parameters, including those defining how cost estimates are calculated and the material or activity prices that are used to value the costing items.

Betolink® Enterprise Module 5

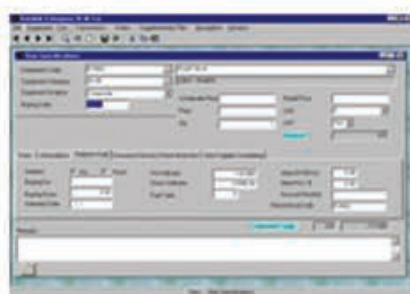
Assets Management



Betolink® VMSs Module 1 (Basic)

Equipment classification, Spare parts, inventory management, Maintenance management, Regular service scheduling and simultaneous checking of availability of spare parts in stock. General expenses management, Breakdown history logs, Statistical Reporting.

Interfaces with Betolink® Enterprise
Installed in the main workshop 5 Users/License



Betolink® VMSs Module 2 (upgrade)

Fuel & lubricant management. Statistical Reporting and consumption per vehicle & per pump warnings. Consumption related to mileage or operating hours. Tracks multiple fuel & lubricant stations.

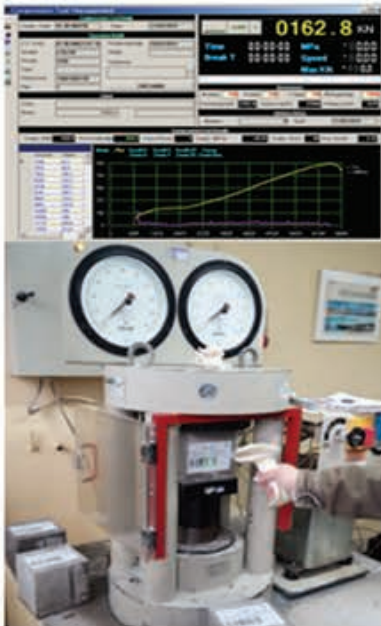
Option to connect with automatic fuel pump dispenser.

Betolink® VMSs Module 3 (upgrade)

Automatically generates lists of parts required per vendor and transforms to purchase orders. The software automatically recommends the vendor per spare part based on best price criteria.

Automatically monitors spare parts delivery per purchase order.

Automatically generates work order based on Preventive Management and scheduled repairs. Purchase order approval and issuing, assigned to authorized personnel only.



Betolink® Laboratory Module 1 (Basic)

Manages specimens and compression test results. When connected to **Betolink® Pro** all test data is directly associated with the specific product from which the specimen was taken. Eliminates errors caused by manual data entry. Communicates with the compression machine and easily records and updates the laboratory's specimen journal. Load-time graph is stored in the data base. Connects results with production and provides reporting. Creates monthly & annual test results comparisons (7d & 36d).

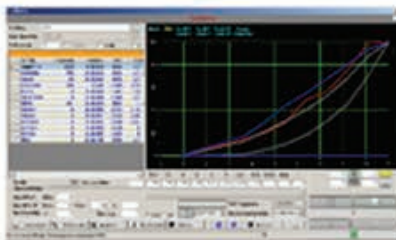
Interfaces with **Betolink® Pro**, **Betolink® Enterprise**

Installed at the company's Laboratory, 5 Users/License.

Betolink® Laboratory Bar code reading (Add on)

Error free specimen management with Bar Code Labels.

All specimens are imported and exported from the curing chamber by automatic label scanning. Compression machine automatic start option when scanning specimen labels.



Betolink® Laboratory Module 2 (upgrade)

Aggregates & other raw materials test Management.

Management & statistical processing of aggregate grain size samples.

Sieves management, Grain size samples registration per aggregate fraction, Statistical process per aggregate fraction (Journals, Limits Graphs, etc.)



Betolink® Laboratory Module 3 RCM (upgrade)

Recipe centralized management and consolidation of company's laboratories.

Installed in each Laboratory when the company has more than one, while the Add on needs to be installed in each plant.

Betolink® Laboratory Module 3 RCM (Add on)



Betolink® Laboratory Module 4 Mix Design

Concrete analysis and mix proportioning software.
Material specifications, aggregate statistics and blending options.
Strength prediction and multigraph analysis.
Specialized software module for skilled Quality Control Managers.



Betolink® Weighing Station Module 1 (Basic)

Weighing Management Software for Weighbridges that automatically records the weight of all incoming and outgoing vehicles and at the same time records raw materials and delivery data (supplier, delivery note, etc.).
When linked with **Betolink® Enterprise** raw material quantities are automatically recorded for precise inventory control. Linked with **Betolink® Pro**, instantly compares weight issued through the batching automation and the actual scale weight.

3 Users/License

Betolink® Weighing Station (Add on)

Tickets and Invoice issuing for companies selling raw materials directly from the weighbridge



Betolink® Manager

Betolink® Manager incorporates in-depth knowledge of the Ready Mixed Concrete Industry requirements.

All data can be consolidated, searched, visualized, and analyzed with just a few clicks.

Betolink® Manager interfaces with all installed Betolink® ERP Modules and collects information, to provide continuous real-time updates. This Business Intelligence software enables you to make smarter, faster decisions that drive spectacular top and bottom line results, to set targets, to see results and to understand what drives the numbers. Formulate strategies for decision-making across every department. Identify and analyze opportunities and threats. Over 300 reports are available including Gross margin and Contribution Reports, Sales Reports, Time Analysis Reports.

3 Users/License

High Quality Admixture Scales



MODEL PR-AS-3

- Plexiglas or INOX Weigh chamber
- Capacity of 40Lt approx. 50Kg
- Weighing is not affected by vibrations due to the chamber's pioneering suspension system
- Weighing accuracy $\pm 20\text{gr}$
- Construction resistant to corrosive materials
- Embodied circuit for the chamber's rinsing using electric valve and water filter
- Air pressure regulator and water trap
- Fast gravity discharge through a 1" squeeze valve with an optional vacuum pump to assist discharge

MODEL PR-AS-4

- INOX weighing container with 4 20Lt capacity compartments
- Hanging admixtures tank by two beam type load cells
- Embodied circuit for the chamber's rinsing using electric valve and water filter
- Fast gravity discharge through 4 electro-pneumatically operated pinch valves
- 4 stainless steel 1Hp/380V/50Hz-charging pumps with integrated fresh water washing system can be added optionally



Hydro-Probe IV (HP04) Moisture Sensor for Bins, Chutes and Conveyor Belts



The Hydro-Probe was the first moisture sensor to use the digital microwave moisture measurement technique. It has integral signal processing which provides a linear output (both digital and analogue) and it can easily be connected to any control system.

Typical applications include sand, cement, concrete, asphalt and aggregates, but the Hydro-Probe IV has also been successfully installed in processing plants for grain, cereal, animal feed and aqua feed. Designed for use in processing plants which use bins (silos), chutes and conveyor or feed belts, the sensor is positioned into the flow of material.

Measurements are taken 25 times per second as the material passes over or around the sensor head, meaning that the sensor can rapidly detect changes in moisture levels.

Real time adjustments to the moisture content of the material can then be made during processing if required. This ensures that the manufacturer can continually produce a consistent quality product and reduce costs by limiting the amount of wasted or spoilt materials.



Rear view of Hydro-Probe IV
with clamp ring fitted



Side view of Hydro-Probe IV
with clamp ring fitted

The sensor HYDRO – PROBE IV measures the moisture of the sand and aggregates, with great accuracy (0.2%).

All the electronic circuits are housed within the probe, thus eliminating the need for external devices apart from the power supply.

It has powerful digital 32-bit micro controller analogue output (0-10 V) and RS485 digital output. The sensor may be internally calibrated using the appropriate software.

The HYDRO – PROBE IV dynamically and continually measures the moisture of aggregates during flow.

Operation relies on microwave technology, which allows moisture measurement at a with 10cm distance of the sensor.

This technology and method is not affected by salt concision of the aggregate, its color or temperature (as happens with many other moisture sensors) or by the thin material layer that is created on the surface of the sensor.

Every Ready Mix concrete producer knows that the moisture in aggregates and especially in the sand affects the quality of the end product.

When using a HYDRO – PROBE IV moisture sensor connected to the automation control, the quantity of the aggregate automatically adjusts and the total water quantity in the batch is measured accordingly.

Concrete Recycling System

Following the latest European Union requirements for the management of fresh concrete residues PROTEM GROUP SA offers complete solutions for immediate reclaiming of raw materials and direct water saving from:

- Returned quantities from customer orders of ready mixed concrete
- Wash outs of production machinery and mixer trucks on their return from the construction sites
- Use of recycled water within the facilities



System Features:

- Environmentally friendly operation
- 3 models available to cover all capacity requirements
- Compact, economical and ergonomically designed system requiring minimum installation space
- Separates aggregates into sand 0.1-5mm and stone >5mm. No other system has this capacity
- Mixer truck drivers can unload their trucks into the system's hopper without monitoring the feeding rate
- The reclaimed aggregates are dry and clean enough for storage
- The system is fabricated with anticorrosive materials
- Full washing cycle can be completed in 10 minutes

Benefits:

- Reduced concrete waste
- High purifying effect. Approximately 90% is recycled clean water that can be reused
- Recirculation system of the recycling water by pumping back into the through
- Simple set-up and easy to operate
- Low maintenance cost
- Secure and fast ROI

Models available:

	PCRS - 80	PCRS - 100	PCRS - 125
Screening Capacity	8 - 10m ³ /h	12-14m ³ /h(Max/h)	>17m ³ /h
Mixing Trucks Number	1 - 10	10 - 30	> 30
Dimension of Main Body (LxWxH)	4.8 x 1.4 x 2.2 m	6.1 x 1.6 x 2.5 m	6.9 x 1.8 x 2.8 m
Weight of Main Body	3.400 kg	4.170 kg	5.270 kg
General Power of Motor	6 kW	8 kW	9.5 kW
Washing Hopper for	1 truck 3m length	2 truck 7m length	3 truck 10m length

SPARE PARTS FOR RM INDUSTRY

We supply at excellent prices and prompt delivery times the following items:



Concrete Mixers

Twin Shaft / Planetary / Turbine Mixers

Load Cells

Stainless steel Load Cells for the different scales (Aggregates, Cement, Water and Admixture)



Water Meters

Water Meters for Ready Mixed Concrete Batching Plants



Water and Admixtures Pumps



Pneumatic Drivings and Electrovalves

PERIPHERAL EQUIPMENT



Turbine flow meters

Flow sensors for measuring flow rate or dosing applications for liquid additives.

- Plastic body (Noryl Pro) unaffected by abrasive liquids
- Fixed pulse rate (855pulse/lt), thus practically no serial deviation
- High precision $\pm 1\%$
- Power supply 24 VDC
- Nominal pressure up to 10 bar
- Max. medium temperature 850 C
- Measuring range 2-40 lt/min
- Diameter DN15. $\frac{3}{4}$ BSP male thread

RMC PERIPHERAL EQUIPMENT



Paddle Level indicator

To prevent silo overfilling installing a level Indicator at the maximum filling point is strongly recommended. When the cement level exceeds the maximum point, the filter's cartridges are damaged.

Rotary level indicators are used for these applications, that an electrical output signal will appear every time the paddle of the sensor stops rotating due to resistance from the materials.

Easy to install, it needs only a 2 1/2" hole. Loose boss included. Tension 220V AC or optionally 24 VDC with extra charges.



Compression machine Integration Kit.

It can be fitted to old analog compression testing machines and enables them to be connected to Betolink® Laboratory software.

The kit consists of:

- Hydraulic pressure sensor 600 bar (Strain gauge type)
- Digital Acquisition system with 7 segment red led display. Interfaces directly with Betolink® Laboratory software through RS232 serial protocol (software is optional).
- Steel wall mounted enclosure with power supply unit and screw terminals.

RS232/485 to Ethernet converter (to connect the controller to the software PC via network)

Tailor made solutions to increase plant's output and intergrate all plants activities



COPYRIGHT 2000-2008 PROTEM

We are specialists in developing advanced fully integrated software solutions to meet the needs of modern Ready mixed businesses. We build our business on our ability to maintain and support the products and services that we all sell. All proposed solutions are developed and produced within PROTEM.



Ready Mix Concrete Production System™ by PROTEM

- | | | | |
|----------------------|---|--|--|
| 1. SALES | Central Management of customers, quotations, contracts, price lists. | 3. LABORATORY | Production integrated quality control system. |
| 2. PRODUCTION | <p>2.1. Productive, accurate batching plants.</p> <p>2.2. Accurate, fast and uninterrupted production through state of art automation control systems, ensuring high product quality.</p> <p>2.3. Orders management, scheduling (for one or more plants). Daily schedule execution, dispatching, fleet monitoring, Delivery Notes.</p> <p>2.4. Management of truck scale for incoming raw materials and mixer trucks.</p> | 4. SERVICE STATION | Stock control, assets and fleet maintenance management system. |
| | | 5. FUELS MANAGEMENT | Unattended fuel pump and supervision of vehicles consumption. |
| | | 6. ACCOUNTING DEPARTMENT | Fast, accurate, simple and secure management of all related processes: Invoicing, Accounts Receivables, Payables, Credit Control, etc. |
| | | 7. MANAGEMENT INFORMATION SYSTEM (M.I.S.) | Management Information System Incorporating all information needed for informed decisions. |

PROTEM's comprehensive maintenance and support service is delivered by a highly skilled team of consultants who have first-hand experience in implementing systems and resolving problems. Flexible leasing plants are available to accommodate customer's financial resources minimizing performance risks.

We consider each RMC batching plant's unique approach renders it a viable investment. In addition to our standard designs, we undertake custom-made RMC projects. We also provide consultancy services.

Stationary Concrete Batching Plants

PROTEM designs and manufactures 40 to 200 m³/h capacity stationary concrete batching plants with different configurations, always maintaining high standards of performance and reliability.

The table below outlines some of the options available:



		Model PR-	40S	80S	100S	120S	160S	200S
Theoretical Production capacity m ³ /h			40	80	100	120	160	200
Mixer capacity (vibrated m ³ concrete/batch)			1,0	2,0	2,5	3,0	4,0	5,0
No Aggregates storage bins	Single Feed Opening / Bin		3 to 5		4 to 6		5 to 6	
	Double Feed Opening / Bin		4 to 5		4 to 6		5 to 6	
Aggregates scale discharging	Lateral (1 Belt)		v	v	v	v	v	v
	Central (2 Belts)			v	v	v	v	v
Aggregates to mixer	by Skip		v	v	v			
	by conveyor belt		v	v	v	v	v	v
	with prehopper above mixer		Optional on Conveyor Belt					
Water measuring	by water meter		v	v	v	v	v	v
	by water scale		v	v	v	v	v	v
	by scale with recycled water dept			v	v	v	v	v
Additives measuring	by time		v	v	v			
	by scale		v	v	v	v	v	v



After an in-depth study of each plant's characteristics we guarantee the production throughput based on a production diagram we produce.



CONTAINERIZED TYPE READY MIX CONCRETE BATCHING PLANTS



This is a state of the art mobile batching plant designed by PROTEM.

The plant is delivered in 5 container sized modules.

They are transported as standard containers thus minimizing expenses such as transportation, civil works, and installation, added to the FOB price.

Available in two mixer and skip versions with different production capacities.



Models & Specifications

MODEL: PR-80/100 CT RMC PLANT CONTAINERIZED TYPE

Standard configuration

Production Capacity (theoretical*)	: 80 or 100 m ³ / Hour
Mixing System	: Twin Shaft 2,0 or 2,5m ³
No of Aggregates compartments	: 4
Aggregate Bunkers capacity	: Total 100 m ³
Electro-pneumatic shutters	: Total Nr. 10
Aggregates scale type	: Lateral unloading
Aggregates conveying to mixer	: By skip
Cement scale Capacity	: 1200 LT/1500 kg
Cement Screw Conveyors	: Ø273mm/ 2pcs std, Max. 4
Water scale Capacity	: 800 Lt / 800 kg
Additives scale capacity	: 30 Lt / 40 kg / 3 admixtures
Compressed Air Supply	: 800 Lt/min – 7,5 bar
Compressed Air Dryer	: Refrigerated type
Electrical power supply cabinet	: Included
Automation Control System	: AUTO-LEADER NG

Optional equipment

1. Aggregate bins ground level feeding & Distribution System

Replaces a ramp for feeding the aggregate bins, avoids the operation costs of a front loader. Delivered as a complete system inside a 40ft container.

Benefits

- Plant can be installed in small plot (approx. 20 x 20 m)
- Plant can be easily covered to protect against extreme weather conditions
- Minimum civil works and foundations required on site
- Can be installed in approx. 3 days and start producing (standard configuration)
- CE certified

Delivery

The standard plant is delivered in 5 container sized modules, 1X40ft and 4X20ft:

- Aggregates scale and bins module with foldable bins walls. Installed on a simple foundation. Delivered pre-assembled and wired as a 40ft container sized frame
- The support module supports the mixer module and the scales module. Installed on a simple foundation. Delivered as a 20ft container sized frame
- The mixer module includes the mixer and the electrical supply cabinet. Installed on top of the support module. Delivered pre-assembled and wired as a 20ft container sized frame
- The scales module includes the water scale, cement scale, admixtures scale and air compressor. Installed on top of the mixer module. Delivered pre-assembled and wired as a 20ft container sized frame
- The control module includes the control room, aggregates skip and the access ladder. Installed on a simple foundation. Delivered pre-assembled and wired as a 20ft container sized frame

The optional equipment is delivered as follows:

- Aggregates bins ground level feeding & Distribution System inside a standard 40ft container
- 2 Cement silos (70 or 100 T) paneled inside a standard 40ft container

Easily Transportable Concrete Batching Plants





PROTEM designs and manufactures 30 to 100 m³/h capacity Easy Transportable Concrete Batching plants.

Benefits

- The compact design allows rapid set up requiring minimum or no concrete foundation works
- Transported to site at minimum cost adhering to international transport standards
- Use of top of the range, powerful Batching Automation Control systems (**PROTEM® AUTO-LEADER NG** or **PROTEM® AUTO-LEADER 3000 PROFIT**)
- Low operation and maintenance costs

The table below outlines some of the options available:

Model -		PR30ET	PR40ET	PR60ET	PR80ET	PR100ET
Theoretical Production capacity m ³ /h		30	40	60	80	100
Mixer capacity (vibrated m ³ concrete/batch)		0,75	1,0	1,5	2,0	2,5
No Aggregates storage bins	Single Feed Opening / Bin	3		3 to 4		
	Double Feed Opening / Bin	3		3 to 4		
Aggregates scale discharging	Lateral (1 Belt)	v	v	v	v	v
	by Skip	v	v	v	v	v
Aggregates to mixer	by conveyor belt			v	v	v
	by water meter	v	v	v	v	v
Water measuring	by water scale				v	v
	by scale with recycled water dept				v	v
Additives measuring	by time	v	v	v		
	by scale	v	v	v	v	v

Concrete Products Precast Batching Plants

Our extensive know-how and experience allows us to offer ready to use solutions taking into consideration the available plot space and the customer's production goals.



PROTEM'S solutions guarantee:

- Secured production capacity
- Ergonomic design
- Flexible positioning
- Efficiency



Top class 3D CAD software enables us to communicate our ideas and designs and work with our customers during the design phase of the project.

All components used in our plants are selected in accordance with our strict quality standards and long-term availability of spare parts.



INDUSTRIAL WEIGHING AUTOMATION

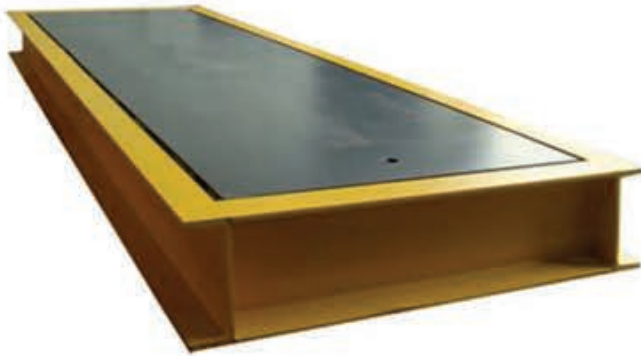
Based on our long-term experience and in-depth technical knowledge, we have developed various Industrial Weighbridge Solutions and automations integrated with the latest Factory Management Software and ERPs.



Axle weighbridges for reliable weighing per truck axle

Axle weighbridges are cost-effective products providing fast and accurate results on axle and gross weight, thus avoiding overloading per axle or gross overloading.

PROTEM provides customized axle weighing systems, offering various options including external printers, data storage devices, computer links and automatic vehicle ID.



In Ground Axle Scale

Fast and accurate axle and gross weight information for all vehicle types from light vans to the heaviest multi-axle vehicles.



Group Axle Weighbridge

Ideal for large multi-axle and articulated vehicles. Useful in eliminating risk of fines.



In Motion Axle Weigher

The system weighs any vehicle up to 30 Tonne / axle "In motion" at speeds up to 10 km / h. Portable . Simple to install and relocate



Mining Truck Axle Scale

Portable system consisting of individual weigh pads which measure dynamically or statically the load on each wheel of a dump truck

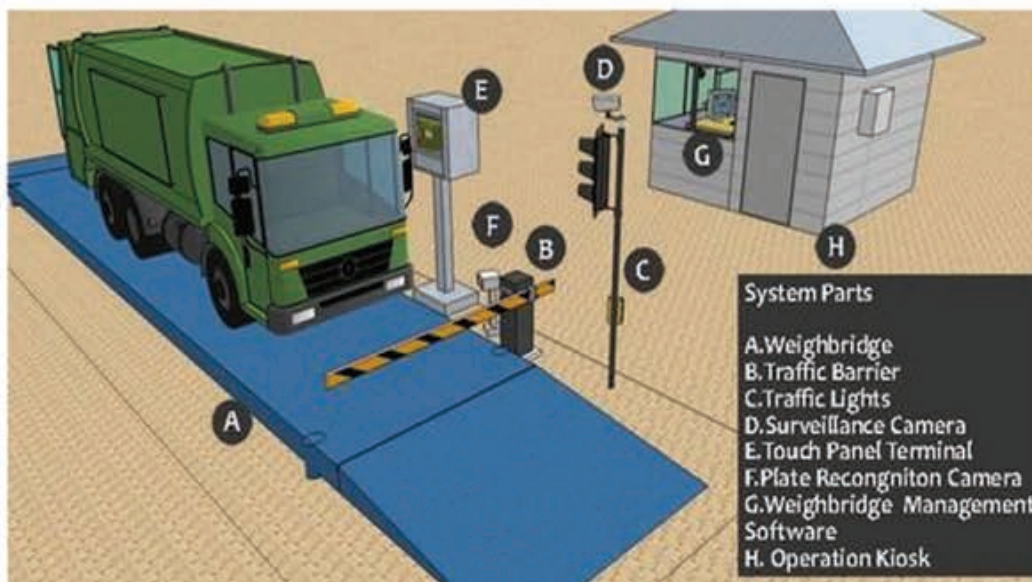


Multiplatform Weighbridge
Eliminates risk of fines. Ideal for large multi-axle and articulated vehicles.

extremely ridged weighbridge that resists on dimpling and prevents the onset of metal fatigue due to extreme or redundant loading.

Weighbridge Automation Systems and applications

Unattended Weighbridge System

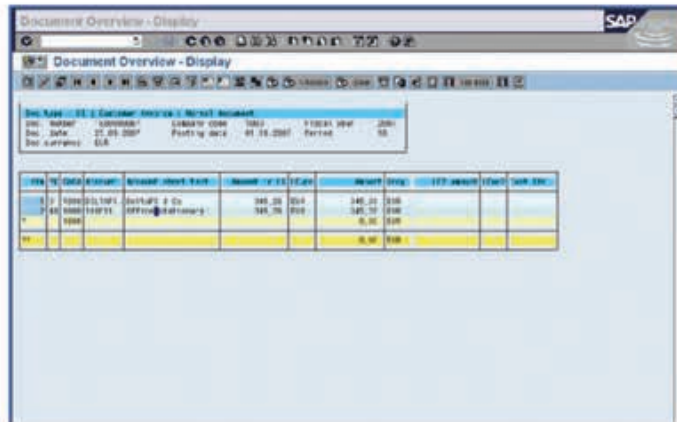


The Unattended Weighbridge System is a stand-alone system which allows 24/7 weighing operations without needing an operator. The system's easy interface enables the truck driver to operate it. Moreover, we can custom design the system to meet your operations' specifications.

Product Features

- Data accuracy with pre-programmed vehicle data using RFID card readers or Touch panel with user friendly interface
- Robust and weather-proof stainless-steel cabinet for added protection with optional climate control.
- Improved facility control and security with traffic barriers, traffic lights, surveillance cameras etc.
- Weighing Data Management Software integrated with industrial scale terminals that provide instant access to critical business information such as operational analysis, billing and inventory control

Weighbridge Plugin For SAP



Item	Material	Weight	Unit	Net Weight	Gross Weight	Tare
1	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
2	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
3	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
4	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
5	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
6	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
7	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
8	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
9	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00
10	CEM 52,5 MPa	345,20	kg	345,20	345,20	0,00

The Weighbridge Plugin for SAP enables the automatic input of weighing tickets into the ERP system. The weighing tickets produced are transferred in a xml form to the ERP's plugin. There they are validated, and forwarded to the SAP system for final confirmation and acceptance. The weighing tickets and their corresponding delivery documents or load sheets are scanned and are immediately visible in SAP for entry validation. There is no need for paper documents to be forwarded from one validation post to another thus time is saved. The approval, invoice generation, and reporting starts immediately after the weighing tickets input. Documents are scanned and immediately available to all SAP clients.

ERP integrated Truck Loading Weighbridge System

PROTEM Cement is an automatic system for truck loading and weighing manipulation. There are five different weighing procedures according to the programmed card type: Bulk loading, material sent, intake material, other types of weighing and internal factory handle.

Program Overview

User's full programmable weighing tickets:

- Separate ticket for first and second weighing
- Separate ticket for each weighing procedure
- Separate ticket for each weighing terminal
- Ticket printed on network PC or weighing indicator
- Entry – Exit from any weighing point

Advanced vehicle management:

- Vehicle legal gross check
- Vehicle nominal tare check
- Card type specific checks before each weighing
- Truck can be grouped for easy management
- Different truck types
- Permanent or temporary cards for each vehicle

Bulk loading:

- Up to fifteen silos connected to each weighing terminal
- Programmable recipe for each silo (coarse, fine, precast)
- Customized or standard recipe for each truck or card
- Several cross-checking procedures take place in, before, after and simultaneously, such as cross-checking of tare and net, overload checking, recipe checking etc
- Remote loading control (stop, pause, ticket print)
- Traffic lights or sound signals for drivers
- Remote messages on indicator screen for driver

Drivers waiting list:

- Waiting time report before each loading is completed
- Drivers in queue

Different card expiration:

- Cards which expire are automatically deleted from the system maximum loading, expiration date, or maximum routes
- Cards can be programmed but disabled
- Different type of checks depended on card category
- Different waiting time for each card

Minimal operation required by drivers:

- Driver only has to pass the barcode card through a local badge reader and then the silo automatically discharges the quantity specified by the central planning office
- Errors or check faults reported from the main system will be visible to the driver from the terminal's display
- Terminal keys can be unlocked from the main system operator

Minimal operation required by operators:

- The operator has complete knowledge of the weighing terminals from a monitor screen
- Errors or check faults are reported on the main system's monitor to the operator with a sound alarm and flashing errors
- The operator is made aware of errors by clicking a button
- The operator can remotely access the weighing terminal (zero, lock, send messages, restart)

Minimal operation required by the card programmers:

- The card programmer can program any type of card very easily
- The programmer can easily view the state of each programmed card
- Easy graphic user interface

Open connectivity with ERP systems:

- Data can be exported to files
- Data can be imported from files

Weighbridge Surveillance Camera



PROTEM development team has incorporated superior surveillance camera technology that feeds snapshots of the truck automatically into the weighing system, when the truck is on the weighbridge. According to needs, (depending on requirements) one picture (front side of the truck) or two pictures (front and rear side of the truck) can be grabbed and stored in the system's memory during the weighing procedure.

Automatic Truck Plate Recognition®



The Automatic Number Plate Recognition (ANPR) system provides a sophisticated and powerful tool for a wide range of weighbridge based operations, particularly for remote or unmanned installations. For automatic or remote weighing in a typical system, the weighbridges usually have entry and exit barriers. When vehicles approach the entrance they are recorded by the camera and the number plate is checked in the database. Registered vehicles are allowed to pass the first barrier onto the weighbridge. At this point the driver inserts his RFID card into the weighing terminal positioned outside and this initiates the weighing. The database can be programmed to contain full details of the vehicle, e.g. tare weight. This information is used to print weighing tickets and invoices.

- Automatic plate recognition, no need for ID tags
- Truck and driver are checked before going on the weighbridge
- Driver verification
- Plate number verification
- Material loaded verification
- Real-time on-line weighing sequence supervision for enhanced security

Industrial weighing applications per sector

Weighbridge Systems For The Cement Industry

Concrete is the second most used product in the world, following water. Consequently, the cement industry plays a fundamental role globally. Cement and cement-related companies require increasingly innovative solutions to maximize overall profit without compromising quality.

PROTEM directly addresses these needs by manufacturing products that facilitate all aspects and stages of the cement manufacturing process including transportation of raw materials (aggregates) from the quarry as well as automating cement shipping from the manufacturing units and connecting them to existing ERP systems (SAP etc.). With almost 30 years of experience in this sector, PROTEM is a pioneer in cement plant installations and can provide customized solutions.

Weighbridge Solutions of Waste Management

Waste is directly linked to human, technological and social development. Pollution and waste management are two key challenges in the modern consumer world and in the rapidly expanding industrialized world. Waste and pollution are plagues of both the modern and developing countries and have become core subjects of national and international legislation. Consequently, finding a solution to effective waste management has become a necessity. We proudly stand at the forefront with our innovative solutions and expertise.



Recycling Sorting Plant

Radiation
Detection System



PROTEM uses its 30-year know-how to offer cost-effective and reliable recycling waste handling systems. Through steady and sustainable solutions, PROTEM has established a bold presence in the installation of waste weighing management systems in Recycling Sorting Plants and has become extremely efficient and effective in the treatment of waste.

Our company is not just offering another waste management system. It offers a complete system that provides the customer with a business activity overview including weighing modules and weighing equipment capable of automatic weighing operations.

This includes connection with ERP systems, enabling the extraction of all statistical data for manipulation useful for billing of different waste operations.

We aim to provide the best solution for Recycling Waste Handling.

We achieve this by a combination of techno - logical know - how and high-quality and personalized customer service.

Weighbridge Solutions For Construction Sites



We have been developing our weighing equipment cutting edge technology for 30 years and we have become the number one company for cost-effective and using reliable solutions for temporary plants and construction sites such as:

- Earthworks
- Road construction sites
- Agriculture plants
- Quarries
- Mining plants, etc.

Conventional truck scales involve costs for civil foundation, making transporting and reinstalling the truck scale from one site to another very expensive. The need for mobility and weighing accuracy has led to the development of our transportable truck scales.

Weighbridge & Weighing Equipment Solutions for Explosive Environments

Hazardous environments are essentially well-regulated, designated areas where explosive materials (such as gases, dusts or fibers) are present. Weighing systems are a vital part of operations in hazardous environments thus must be equipped for such conditions.



PROTEM provides pit and surface mounted weighbridges for hazardous environments. To maximize safety, our pit mounted weighbridges are designed with a row of drilled holes along the deck allowing ventilation from below that prevents gas build-up in the event of spillage during the filling process. No drilling is required for surface mounted weighbridges.

PROTEM® Dumper Weighing



Dumper Weighing is an unattended weighing in-motion system for the control and management of the dumper's weighing process. The axle scale is placed near the feeder of the crusher.

The unattended weighing in-motion of the dumpers is achieved by:

- Drivers are signaled for the axle status
- Vehicles are identified via RFID technology
- Detailed weighing data is automatically registered

The system creates the following reports:

- Detailed/Summary based report per dumper showing when and how much material was unloaded to the feeder
- Per shift, daily, weekly, monthly, yearly crusher productivity report

The system consists of:

- Heavy duty axle scale
- Control panel
- Vehicles identification system
- Weighing management software for scales Betolink® Weighing Station

Advantages:

- Reduced operational cost
- Increased productivity compared to truck scales
- Fully integrated with Betolink® ERP
- Full production statistical reports
- Low implementation cost compared to truck scales
- Ease of installation and training/using compared to truck scales

BELT WEIGHERS AND SCADA SYSTEM QUARRIES AUTOMATION



Quarries Solutions

PROTEM offers turnkey and tailor-made solutions for quarries. We can meet all our customers' needs



Belt weighers



Process Control



Dumper Weighing

We can also offer:

- Mobile and stationary crushing and conveying equipment
- Upgrades/Retrofits of existing plants
- Software solutions and belt weighers
- Weighbridges

SILO BOLT ON OR LOAD-CELLS BASED WEIGHING SYSTEMS

We supply all type of solutions for silo weighing either on loadcells base for high accuracy (1-0,3 per mile) or using an easily retrofit bolt on system of 2-5% accuracy. Silo weight can be further processed upon customer request.





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