HMI Enhancement & Automation of Construction Vehicles

Foundation & Substructure

Concrete Mixing Equipment
VANTAGE COMMERCE PTE. LTD. (Singapore) is a part of a transnational network of trading houses and consulting firms for infrastructure and civil engineering.

Together with our associated companies, Nowitex GmbH (Germany) and OOO Intelmash (Russia), we provide our global clients with quality EU and US technology.

With our team of commercial, technical and legal experts, we are able to deliver critical analyses of projects and offer qualified advice and supporting products from our carefully chosen and highly competitive portfolio.

Our 3 distinct product groups are:

**HMI Enhancement and Automation of Construction Vehicles**

In the field of construction vehicle fleet optimization, we are proud to distribute MOBA Mobile Automation AG. Our offered products are designed for asphalt pavers, motor graders, excavators, bulldozers, pumps, trucks, wheel loaders, and a wide range of other vehicles and equipment.

Our offered products encompass:
- Digital leveling
- Grade control
- Slope control
- Temperature profiling
- Workload analysis
- 2D / 3D machine control

**Foundation & Sub-Structure**

The quality of any construction project is initially determined by the stability of the ground. Through representation of our partner Terra-Mix Bodenstabilisierungs GmbH, we are able to deliver their proven technologies for impulse compaction, ground stabilization and road renovation.

**Concrete Mixing Equipment**

Merko CZ, a.s. belongs among the leading producers in the European Union. We provide high-quality, customisable plants to fit all your concrete mixing and recycling system requirements.

For small to medium construction sites and remote locations, we offer a mobile concrete mixing system which can be easily mounted on any truck or trailer from Zimmerman Industries, Inc. With functional design and patented material feed chain, we guarantee quality production in a compact unit.
HMI Enhancement & Automation of Construction Vehicles

In the field of construction vehicle fleet optimization, we are proud to distribute MOBA Mobile Automation AG products in selected countries in South East Asia (SEA) and the Commonwealth of Independent States (CIS).

Our portfolio is centered on improving the human-machine interface (HMI) of construction vehicles and therefore eliminating human error and consequently empowering the operators to deliver better working results at lower running cost and with higher efficiency and precision.

Thus, our distributed products contribute significantly to improving the predictability and overall quality of results.

Sonic Ski

The system takes advantage of multiple ultrasonic sensors by combining three sets of multi-sensor detectors along the beam to detect and smooth-out both large-scale waves and small-scale bumps. Through combining several sensors, an accurate measurement of an extended range is possible. With these measurements, the system calculates an average, and provides a virtual reference level.

The Sonic-Ski® in combination with the MOBA-matic II control panel, screed control is even easier. Operation of the basic functions is extremely simple, through the use of 3.5 inch colour display and just four control buttons and clear, simple symbols.

MOBA-matic II

The modular system enables a flexible choice of sensors, depending upon the application. It is easy to install and simple to operate. The system has been proved to optimise the paving output of the machine, prevent paving of too little or too much material, thus increase paving quality and planarity.

Xsite® Pro 3D

With Xsite® PRO, the operator, supervisor, or surveyor can create a model with several levels on a wide 8.4-inch colour display. The system will record depth, inclination, and range of the excavator bucket and display all the configuration on the graphic display, located in the cab, for the operator to view.

The GNSS upgrade is also available for Xsite® PRO to enable 3D mode, making it possible to create 3D specifications (excavation pits, foundations, ditches, trenches, etc.) while the excavator is working at the construction site.

Xsite® Easy 2D

The Xsite®EASY 2D system measures depth, range and inclination of the bucket, and furthermore depicts the bucket position graphically and numerically on the display. The system also comes pre-equipped with an additional LED display which shows in a single view the work progress that has been made and if the target level was achieved. Using the displayed information, the machine operator always knows the exact position, and work progress. This allows the operator to precisely implement any specification set, even at construction sites with poor visibility or under water.

Pave-IR™

The purpose of the PAVE-IR™ Scan quality control system is recording the asphalt temperature during paving. The measured temperatures are displayed on the panel while the system generates complete temperature profiles, compiling temperature measurements throughout the entire construction process. This quality control system not only records the temperature data, but also the GNSS position and weather data. The data can then be evaluated with the Pave Project Manager software. Areas with thermal segregation are detected and further analyzed. Using this data, the system allows conclusions to be drawn about the quality of the asphalt, making possible improvements to the process, and the road quality.
GDC-320

The MOBA HLC-1000 is a simple weighing system designed to provide weight monitoring during loading. The weight is determined using sensors that measure hydraulic pressure in front of and behind the hydraulic cylinder. As the position of the loading bucket also makes a difference, its position is also determined using slope sensors. The display shows the load being added to the bucket and automatically calculates the total amount of material loaded (of all separate loads) in real time. Alternatively, the operator can enter a target weight and then the system will count down to zero from it. This makes it possible to record exact weights and monitor for overload during loading without interrupting the work in progress.

3D-matic

MOBA 3D-matic is the optimal 3D levelling system for use on graders, dozers and blades. A height detection precision of ±2 centimetres makes it possible to attain exact planarity of the processed surfaces. With such accuracy, the work process is accelerated, rendering surveying work and manual control measurements no longer necessary.

When equipped with a complete work station, precise leveling is possible even where there is no satellite reception (e.g. in tunnels, as only visual contact from the prism to the total station is ensured). With a GNSS sensor, precise leveling is possible even without visual contact in all weather conditions.

GS-506

As a 2D leveling system, the GS-506 offers precise and reliable height and slope control and a high level of flexibility in the choice of sensors and fields of application. Through its great flexibility, the MOBA GS-506 system is the ultimate solution for most auto-grader and bulldozer applications.

The increased productivity ensures that all leveling is performed faster and more accurately, therefore, the system saves time and money, consequently paying for itself. With its height accuracy, it is eliminating the need for staking out and costly processes of correction from the outset.

MCA-3000

Through the optimal interaction between acceleration sensor, temperature sensor and GNSS antenna the MCA-3000 helps to achieve compaction results at the highest level. With our high-end operand, the entire process is also visualized, thereby helping you to keep track of current asphalt temperature, the compaction target value and the number of crossings at all times. Thanks to an unproblematic display of measurements, the proper interpretation of the measured values are learnt intuitively and quickly. As a proof of quality all compaction data is also summarized and retrievable from a web server on demand at any time.

Due to its innovative fleet management the crossings of different rolls are synchronized with each other, so that each passage is optimally compacted. This automatic coordination ensures all-time highest quality and allows the use of multiple rollers and operators at the same time! Thus, large projects are implemented in the shortest possible time and extremely cost-effectively.
Foundation & Substructure
- Impulse Compaction

The quality of any construction project is initially determined by the stability of the ground. The TERRA-MIX system is an innovative method for ground improvement down to medium depths with the combination of impulse compaction and replacement of base layer. With this system all compactable grounds can be quickly and economically compacted and with the combination of base layer replacement or stone columns, even cohesive soil can be turned into good bearing soil.

With thorough preparations the construction activity using impulse compaction can usually be accomplished quicker than with other foundation building alternatives. Furthermore, every project features complete documentation of all relevant data for all compaction points, such as GPS-coordinates, date, time, applied energy, number of impulses, settling per impulse etc. Based on this data the compaction result can be exactly reproduced during as well as after the initial work process.

Areas of Application
- Substructure improvement for buildings (shopping centers, halls, factories, residential etc.)
- Foundation of infrastructure, such as roads, motorways, railways, bridges etc.
- Water and foundation engineering (flood protection dams, retention basins etc.)

Impulse compaction refers to the methodology of dropping a weight of 9 metric tons onto a steel plate (compactor foot) at a frequency of 40-60 blows / minute. Through this continuous energy transfer, the sub-soil is being homogenized.

The achieved compaction can be most effectively verified using dynamic probing or through CPT pressure probing (Cone Penetration Test) before and after the compaction. Continuous recording, storage and documentation of all relevant compaction parameters for every compaction point ensures the quality. Date and time, exact position using GPS co-ordinates, settling per impulse, total settling curve, number of impulses, and energy provided. Based on this data the compaction result can be exactly reproduced during as well as after the initial work process.
Ground stabilization describes the process of applying a protective replacement carrier layer onto soil which would be otherwise too unstable as a substructure for construction projects.

When higher requirements on the building ground have to be met, the strengthening of the ground is a required process. This in order to ensure an effective frost protection layer and to create a substructure able to take the necessary load. The old method of completely clearing away the soil from the construction site, transporting to a dump site, and replacing the construction site surface with granulated rock - large stone chippings or gravel - becomes less cost-effective and time-consuming.

We introduce the new Terra-Mix technology using a special binder mixture to strengthen the carrier layers, following by thorough compaction. The binder mixture is customized to the specifications of each project. Many load tests prove the successful application of ground stabilisation. Terra-Mix technology in ground stabilisation has been used for new constructions as well as for renovation of roads and streets. Ground stabilisation is also a valuable contribution to the Environmental Impact Assessment for environment protection in construction projects.
Concrete Mixing Equipment

Merko CZ, a.s. belongs among the leading producers of concrete batching plants in Europe. They provide a wide variety of mobile and stationary concrete batching plants which are designed for production of high quality concrete.

Horizontal concrete batching plants have a stationary layout. The output of standard types ranges from 25 m³ / hour up to 120 m³ / hour. The technical arrangement allows to choose the type of aggregate bin according to specific conditions and location of the production site.

Horizontal concrete batching plants are economical and the most common concrete batching plants on the market. With their flexible layouts and endless combinations of various types of aggregate bins, these horizontal concrete batching plants are suitable for a wide range of application.

The adaptable layouts provide customised solutions for any construction requirements, from highest quality of concrete mix to highest output per hour.

These stationary plants are designed for long-term usage and often mounted on a solid foundation. A maintenance friendly and ease-of-access concept allow an efficient and quick maintenance process for the whole plant. All plants are equipped with an automatic control system to monitor and record each single step of the concrete production.

Horizontal concrete batching plants come equipped with a BHS twin shaft mixer (made in Germany), a belt conveyor, and a linear aggregate bin as per our standard. However, other options such as a skip conveyor, a compartment bin, star depot, and a conical bin are available based on the requirements of the customer.

Theoretical output is from 50 up to 120 m³ / hour.

### TYPE OF BATCHING PLANT

<table>
<thead>
<tr>
<th></th>
<th>HBS 1.25D</th>
<th>HBS 1.67D</th>
<th>HBS 2D</th>
<th>HBS 3D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of mixer</td>
<td>Twin-shaft</td>
<td>Twin-shaft</td>
<td>Twin-shaft</td>
<td>Twin-shaft</td>
</tr>
<tr>
<td>Production of fresh concrete per 1 batch [m³]</td>
<td>1.25</td>
<td>1.67</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Theoretical output of the plant [m³/h]</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>120</td>
</tr>
<tr>
<td>Discharge hopper height [m]</td>
<td>4.1</td>
<td>4.1</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Weighing of aggregate [Kg]</td>
<td>3,500</td>
<td>4,500</td>
<td>5,000</td>
<td>7,500</td>
</tr>
<tr>
<td>Cement scale [Kg]</td>
<td>750</td>
<td>1,200</td>
<td>1,200</td>
<td>1,500</td>
</tr>
<tr>
<td>Water scale [Kg]</td>
<td>400</td>
<td>600</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>Scale of additives [Kg]</td>
<td>6 + 15</td>
<td>6 + 15</td>
<td>10 + 22</td>
<td>12 + 30</td>
</tr>
<tr>
<td>Number of Suggested volume of aggregate bin [m³]</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>200</td>
</tr>
</tbody>
</table>

Series HBS with a linear aggregate bin (HBS + ZKL)

Concrete batching plants with a linear aggregate bin.

Gravel is weighed via weighing belt under the bin before being transported into the mixer by the help of a skip conveyor or alternatively via a conveyor belt.

Theoretical output is from 50 up to 120 m³ / hour.

Series HBS with radial scraper and star depot (HBS + RP)

Radial scraper is placed in the front of the star depot steel structure. The weighing of aggregates is made via a skip conveyor.

Theoretical output is approximately 50 m³ / hour.

Series HBS with a conical aggregate bin (HBS + ZKV)

A Compromise between horizontal and tower plant.

Gravel is stored in a conical aggregate bin which is placed next to the concrete batching plant. The gravel is transported into the bin by the help of an elevator or an inclined conveyor belt.

Theoretical output is from 50 up to 120 m³ / hour.
**Mobile concrete batching plants** are especially used for the production of ready-mix concrete. The main advantage of the mobile version of concrete batching plants is fast assembling at the target location and also subsequently rapid disassembling for quick relocation to another production site. We offer a wide range of mobile concrete batching plants from compact plants with an output of 50 m³/hour up to large plants with an output of 120 m³/hour.

<table>
<thead>
<tr>
<th>Type of Batching Plant</th>
<th>MB 0.5T</th>
<th>MB 1T</th>
<th>MB 2D</th>
<th>MBP 3D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of mixer</td>
<td>Pan</td>
<td>Pan</td>
<td>Twin-shaft</td>
<td>Twin-shaft</td>
</tr>
<tr>
<td>Production of fresh concrete per 1 batch [m³]</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Theoretical output of the plant [m³/h]</td>
<td>25</td>
<td>45</td>
<td>80</td>
<td>120</td>
</tr>
<tr>
<td>Discharge hopper height [m]</td>
<td>4.1</td>
<td>4.1</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Weighing of aggregate [Kg]</td>
<td>1,250</td>
<td>2,500</td>
<td>5,000</td>
<td>7,500</td>
</tr>
<tr>
<td>Cement scale [Kg]</td>
<td>300</td>
<td>600</td>
<td>1,200</td>
<td>1,500</td>
</tr>
<tr>
<td>Water scale [L]</td>
<td>Flow meter</td>
<td>300</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>Scale of additives [Kg]</td>
<td>6</td>
<td>6 + 15</td>
<td>10 + 22</td>
<td>10 + 22</td>
</tr>
<tr>
<td>Number of Suggested volume of aggregate bin [m³]</td>
<td>32</td>
<td>60</td>
<td>72</td>
<td>140</td>
</tr>
</tbody>
</table>

A mobile concrete batching plant is similar to a horizontal batching plant in concrete production process and overall layout. However, the main concept differs when it comes to mobility and footprint size since the mobile version take advantage of its ability to be assembled and disassembled rapidly and easily for quick relocation. The design also comes with special joints for a fast electrical and mechanical connection.

The mobile concrete batching plants are designed for temporary projects of typically 2-3 years. Upon completion of the project, they are disassembled and transported to a new project site. The mobile concrete batching plants are smaller and lighter than their horizontal counterpart. The mobile plants provide ease in transportation since the their steel structure, together with other components are small enough to fit into a freight container or a shipping truck.

The horizontal concrete batching plants comes equipped with a BHS twin shaft mixer (made in Germany), a belt conveyor, and a linear aggregate bin as per our standard. However, other options such as a skip conveyor, a compartment bin, star depot, and a conical bin are available based on the requirements of the customer.

**Series MB**
A compact plant with a compartment aggregate bin connecting to the mixing center.
Aggregate weighing is done via a skip conveyor that is equipped with load cells.
Theoretical output is from 25 up to 90 m³/hour.

**Series MBP**
Concrete batching plants with a linear aggregate bin
Gravel is weighed via weighing belt under the bin before being transported into the mixer by the help of an inclined conveyor belt.
Theoretical output is from 50 up to 120 m³/hour.

**Series MBS**
Concrete batching plants with a linear aggregate bin
Gravel is weighed via weighing belt under the bin before being transported into the mixer by the help of a skip conveyor.
Theoretical output is from 50 up to 120 m³/hour.
The concrete batching plants we offer are highly customizable. Please contact our Team of Technical and Sales Consultants in order to receive a tailor-made solution.

### Options and Customization:

- **Belt / Skip Conveyor**
  Means of gravel transportation from the aggregate bin to the mixer

- **Galvanised steel structure**
  Protecting layer of the steel frame from the environment in order to prolong the lifetime of the concrete batching plant

- **Various Silos and Aggregate bin**
  Flexible design options providing variety of sizes and storage unit style to ensure most effective concrete production

- **Cooling System**
  Cooling of aggregates and cement for a high quality concrete production

- **A/C in control room**
  Temperature-controlled environment for both electronics and operator

- **Fully automatic Control System**
  Software and connectivity system for close monitoring and full automation of the entire concrete batching plant

- **CCTV**
  Camera System to enhance security of the plant with local and remote login

### Recycling units

Recycling units are used to process the remainder concrete mixtures discharged from concrete batching plants and trucks. The process is essentially to filter gravel and rough sand from the sludge which enables re-using of the filtered materials. It is designed to provide an environmentally friendly circular system. The recycling process reduces the consumption of raw material and minimizes material waste. Recycling units perform with a maximum throughput rate from 9 to 20 m³ / hour.

#### Drum Recycling Unit (RZB)

**Maximum throughput rate of 9m³/h**

A stationary above-ground unit with theoretical maximum throughput rate of 9 m³ / hour. The washing drum consists of a cylindrical vessel with a fixed internal spiral to separate rough material. The efficient design of a counter-flow system leads to an excellent performance in separating rough and fine material.

#### Screw Recycling Unit (RZS)

**Maximum throughput rate of 12-20m³/h**

This unit is designed for mobile as well as for stationary usage. The separation of gravel is achieved with a rotating screw and a fixed chassis. The Unit is available in two different sizes: 12m³ / hour and 20m³ / hour.

#### Conical recycling unit (RZV)

**Maximum throughput rate of 15-20m³/h**

This recycling unit is equipped with a slow-run screw system for the efficient material discharge and the separation of an independent constituent of concrete mixture. This type of recycling unit can clean out up to two truck mixers at the same time.

A conical recycling unit comes in two sizes, with an throughput rate of 15m³ / hour and 20m³ / hour.
The Zim-Mixer® is available in a standard production rate of 22.5 m³ per hour, or a customised option of 45 m³ per hour.

- **3-year or 10,000 m³ warranty on material feed chains**
- **No spillage of sand or stone along the length of the unit, due to the unique design, allowing cleaner performance on a cleaner chassis**
- **Individually dispensing of aggregates at any time using the independent clutch system in order to decrease calibration time.**
- **Meeting the specifications: ASTM C-685, ACI, AASHTO M-241, VMMB and CE-Certified.**

### Volumetric truck mixers

Zimmerman Industries, Inc. offers a highly mobile solution for cement mixers to reach rural areas and smaller to medium sized construction sites. The Zim-Mixer® blends concrete on the job site and is designed to carry the sand, stone, cement and water in separate compartments. The Zim-Mixer® can be easily mounted on any truck, trailer or be used for stationary usage.

- **A. PATENTED MATERIAL CHAIN FEED SYSTEM** (Patented US 4601,629.)
  - Three times the life of older belt feed systems with less maintenance

- **B. FULL DECK**
  - Surrounding entire unit

- **C. NUMBERED DIAL PLATE**
  - Mixed design, the fastest in the industry

- **D. MATERIAL FEED**
  - Separate chains for sand and stone, allowing for easier change of aggregates and calibration

- **E. AUGER MOTOR**
  - Rear mounted motor putting torque where it is needed. Made for easier and faster service

- **F. DUST REDUCTION SYSTEM**
  - Reducing excess dust.

### Potential application

- Remote Locations
- Construction Site
- Residential
- Repair Works
- Municipal
- Military
- Dams
- Railroads
- Pools
- Precast
- Airports
- Tunnels

### Potential application

**Concrete Mixing Equipment**

- Zimmerman Industries, Inc.

### The Zim-Mixer®

- **Capacity [m³]**
  - ZM-404: 3.00
  - ZM-405: 3.80
  - ZM-406: 4.50
  - ZM-407: 6.00
  - ZM-408: 6.80
  - ZM-409: 7.60
  - ZM-410: 8.40

- **Production rate [m³/h]**
  - ZM-404: 22.50
  - ZM-405: 22.50
  - ZM-406: 22.50
  - ZM-407: 22.5 - 45
  - ZM-408: 22.5 - 45
  - ZM-409: 22.5 - 45
  - ZM-410: 22.5 - 45

- **Cement capacity [m³]**
  - ZM-404: 1.60
  - ZM-405: 1.60
  - ZM-406: 1.60
  - ZM-407: 2.70
  - ZM-408: 2.70
  - ZM-409: 2.70
  - ZM-410: 3.20

- **Water capacity [L]**
  - ZM-404: 757
  - ZM-405: 1,136
  - ZM-406: 1,136
  - ZM-407: 1,514
  - ZM-408: 1,514
  - ZM-409: 1,514
  - ZM-410: 1,893

- **Aggregate bin capacity [m³]**
  - ZM-404: 4.20
  - ZM-405: 5.10
  - ZM-406: 6.10
  - ZM-407: 8.00
  - ZM-408: 8.90
  - ZM-409: 10.00
  - ZM-410: 11.00

- **Empty unit weight [Kg]**
  - ZM-404: 3,447
  - ZM-405: 3,538
  - ZM-406: 3,538
  - ZM-407: 4,082
  - ZM-408: 4,173
  - ZM-409: 4,262
  - ZM-410: 4,536

- **Hydraulic pump**
  - ZM-404: 4 section gear

- **Deliver system**
  - ZM-404: Patented material feed chain

- **Auger length [mm]**
  - ZM-404: 2,743

- **Auger diameter [mm]**
  - ZM-404: 228.00 - 228.00

### CHASSIS MOUNTING INFORMATION (minimum requirements)

- **Front axle [Kg]**
  - ZM-404: 6,350
  - ZM-405: 7,257
  - ZM-406: 7,257
  - ZM-407: 8,165
  - ZM-408: 8,165
  - ZM-409: 9,072
  - ZM-410: 9,072

- **Rear axle [Kg]**
  - ZM-404: 16,330
  - ZM-405: 16,330
  - ZM-406: 16,330
  - ZM-407: 20,870
  - ZM-408: 20,870
  - ZM-409: 20,870
  - ZM-410: 20,870

- **Cab to axle [mm]**
  - ZM-404: 3,937

- **Frame width [mm]**
  - ZM-404: 858