SCHWING Stetter

MC 500

Control system for batching plants

RECORD BREAKING ENGINEERING

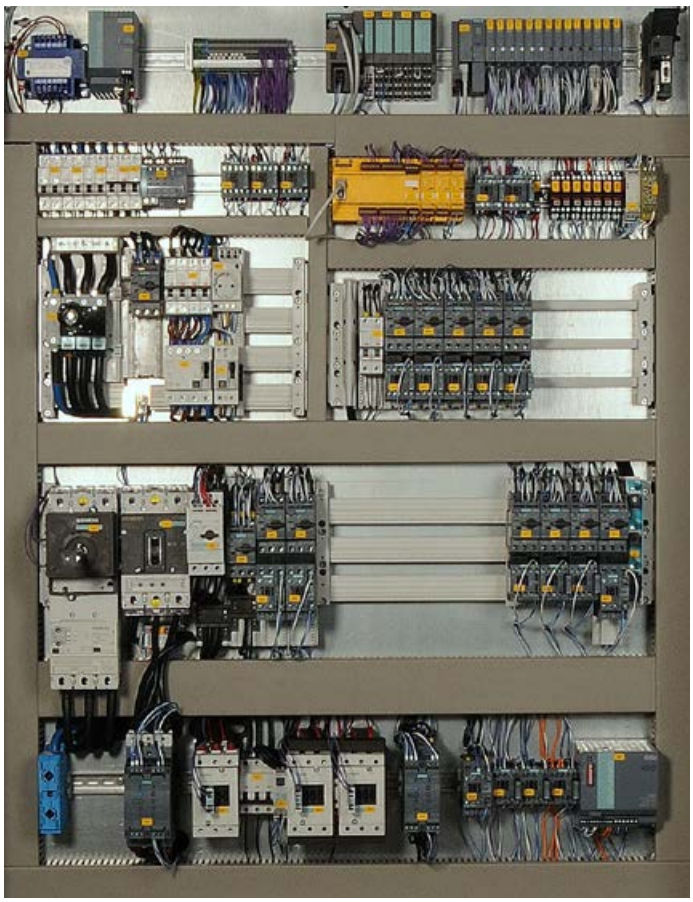
Control systems for batching plants from Stetter

The optimal solution for every batching plant

Stetter has wide experience gained over many years in the development of process control systems for concrete batching plants, and has become a market leader in plant and control configuration for just this very purpose. To protect the customer's investment is our main duty and means that we at Stetter input a maximum in serviceability, functional reliability and professionalism into our plants and our control systems. After all, customer satisfaction is a premium and has been demonstrated in more than 1,000 installed control systems all over the world.

Flexibility and security of investment

The architecture of the Stetter software, custom-developed in our own R&D department, and the multiple configuration possibilities that arise from that, make it an easy task to adapt a plant control system to any existing production process. Circuit arrangements, switchgear cabinets and the relevant circuit and wiring diagrams are all worked out in our own engineering division and are optimally adapted to Stetter batching plants. Our system flexibility even allows us to custom-build control systems for use in other makes of batching plants.



Proven solutions for the concrete industry

The commercial industrial production of concrete calls for more than just an elementary batching plant control system. A comprehensive package to satisfy the concrete producer and his customers covers a series of tasks ranging from the initial quotation to production planning, the production of the concrete itself and the management of mixer and pump fleets, right through to the issuing of the invoice for the concrete delivered. In addition, the correlation of various statistics for production and accounting management must be taken into account. For companies that operate several batching plants in a company frame, it is essential to have a network running on a common database that can provide instant transparency for the management. This is exactly the point where Stetter offers customized, but also standardized, solutions.

The optimal control for every batching plant

Every Stetter plant control system is available in your language. The MC 110 control system, for example, is the solution for plants with batch sizes up to 1 m3. For larger batching plants, networked plants, or plants with special requirements on delivery note printing and statistics, the MC 500 is the recommended control system.

Quality, reliability and safety

When choosing hardware components, we select only proven and high-grade material that is reliable enough for our requirements. But whatever the brand or make of component, it must pass our stringent QC testing simulations even during the development stages. Constant final acceptance tests are also essential for long-term product quality and reliability, naturally always with ISO 9001 certification. Of course, we comply with the Machine Directive IEC 62061 and ISO 13849.

Electrics **MC 500** Batching plant control system

Power unit

At Stetter, we develop and make our own HV modules in consideration of all relevant international, national and safety standards.
Circuit and current-flow diagrams are generated on our CAD system and are supplied as hard copy and in .pdf format.

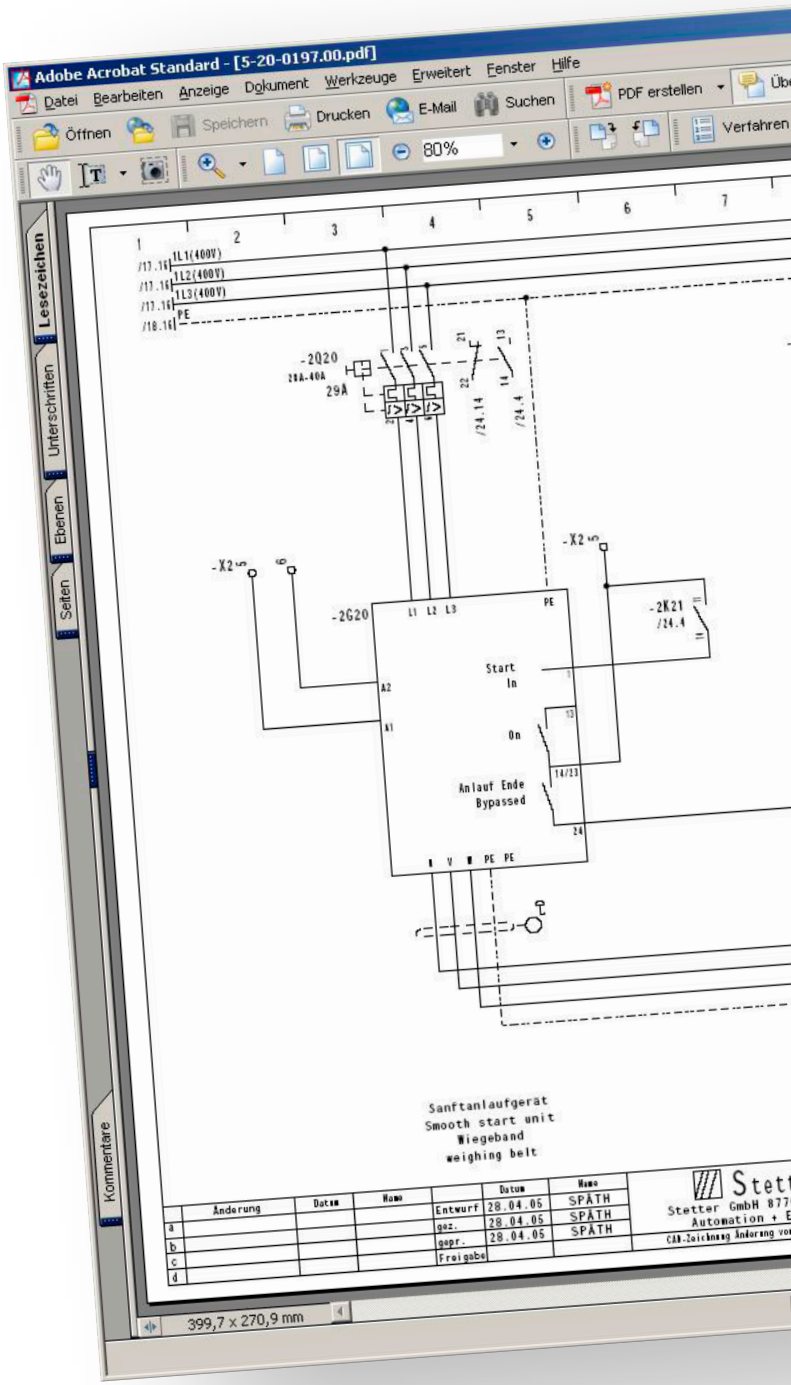
Control with investment security

The batching plant controller program runs independently of the main processor on its own PLC (programmable logic control). Such systems have proven their value not only in the concrete industry but also in many other industries. The clear separation of “jobs” makes it possible to keep the systems easily “up to date” and make use of the latest technological developments. The result is a family of hard-ware and software that is on the one hand reliable and ro-bust, on the other easily extendable to future needs.

Following our concept, the main processor runs only the backbone functions of the plant. The “real-time” jobs are undertaken in the PLC which is easily accessible but pro-tected inside the main switch cabinet. Stetter control systems use exclusively the SIEMENS PLCs, thereby ensuring a maximum level of quality in a state-of-the-art form and with easy exchangeability. All for the benefit of the customer in long years of plant op-eration.

Modular through the use of industrial-ethernet

We make extensive use of BUS systems not only with comply to today’s requirements, but also to maintain the flexibility required for tomorrow’s tasks. The difference to other systems is that the BUS does not have each signal line running from limit switches, etc., through the whole plant and into the controller area. The BUS registers the signal on the spot and then transmits through the main BUS line. That greatly reduces the complexity and expense of the overall plant wiring system and therefore greatly reduces the number of potential errors or faults that might occur. It also allows easy upgrading and extension to cover more tasks.



Overview **MC 500** Batching plant control system

MC 500 BATCH	MC 500 DISPO	MC 500 FMS	MC 500 FAKTURA	MC 500 SYNC
Dosing and Batch Control Unit	**Dispatching**	**Fleet Management**	**Invoicing**	**Database-synchronization**
Order Management Production Statistics	Order Management Production Planning Truck Planning Pump Dispatching	Truck Tracking Street Maps Route Planning Navigation	Invoices Offers Turnover Statistics	Synchronisation of Separated Databases

MC 500 Base
Database, Data Management, Data Permissions, Basic Functions

The MC 500-family

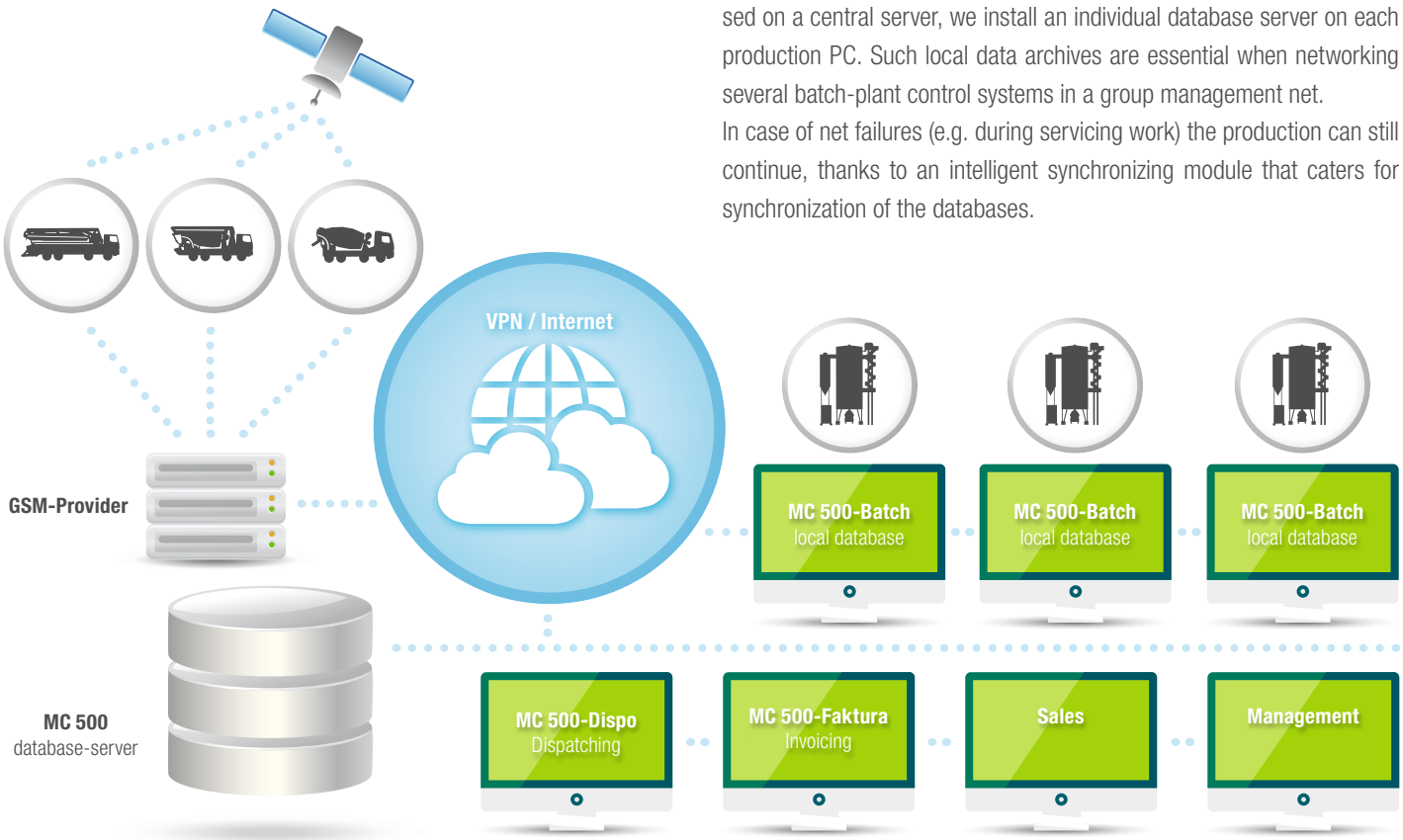
MC 500 is a family of software modules all built on the same software platform and with a common operator interface. Features to which we have attached priority importance to ensure perfect intercommunication performance. Each module is designed and keyed to fulfil the customer's requirements and according to the registered operator rights. The hierarchy of operator rights determines who can view and process the operating data. Each module can be run from any connected workstation to give optimum flexibility in personnel deployment.

MC 500 in network

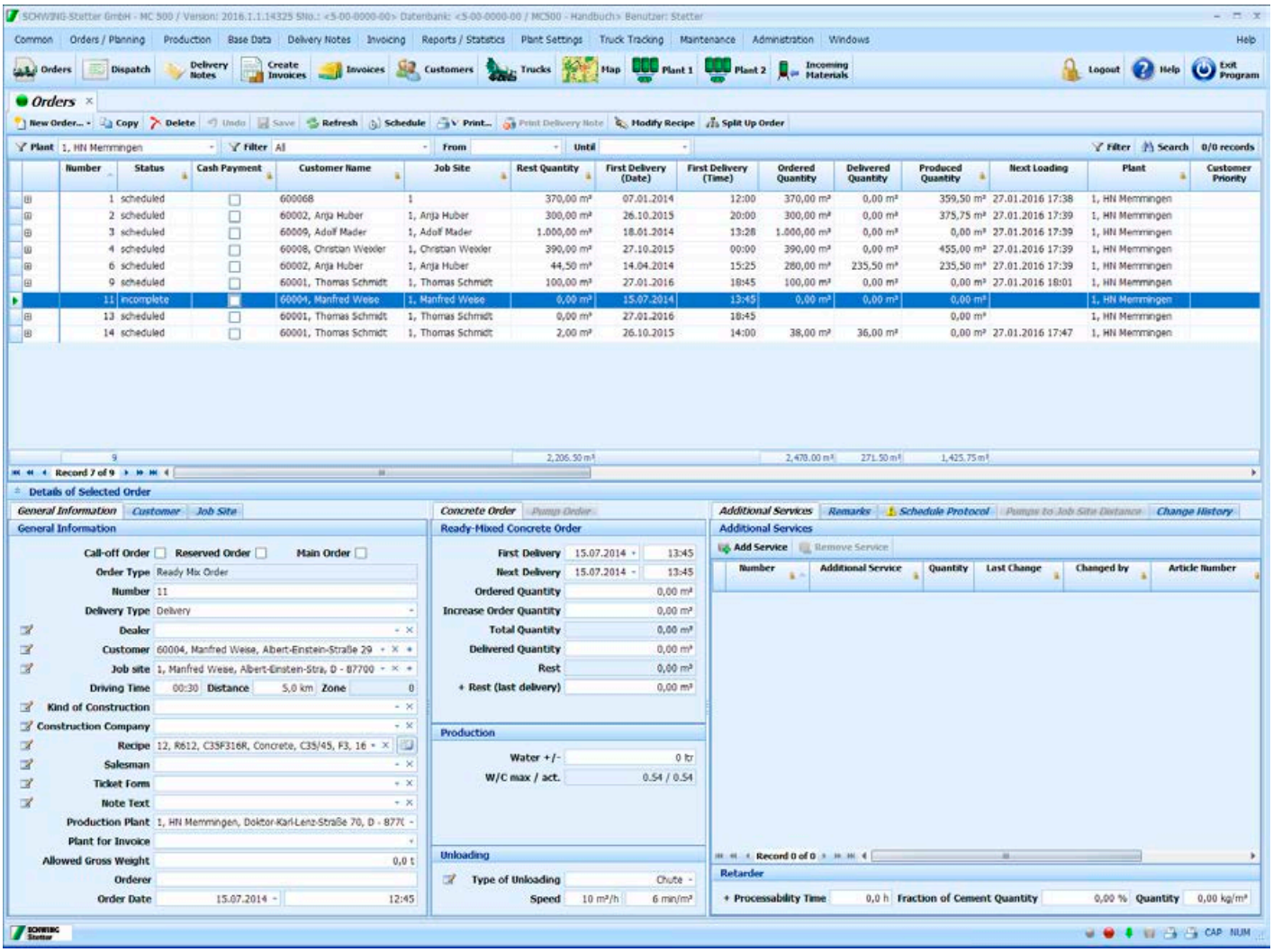
MC 500 can be adapted to the user requirements either as a workplace solution or in an integrated network. Networking of individual workplaces is the solution to cope with increased workloads, or to connect several batching plants from one management desk.

Data security inclusive

Our professional client/server database is the foundation for a multi-net and transparent data archive. Other than with expensive solutions based on a central server, we install an individual database server on each production PC. Such local data archives are essential when networking several batch-plant control systems in a group management net.
In case of net failures (e.g. during servicing work) the production can still continue, thanks to an intelligent synchronizing module that caters for synchronization of the databases.



MC 500 Batching plant control system



Availability always and everywhere

Our synchronization module uses a configuration table to determine which data sets need to be synchronized with the connected databases. We have taken this “lean approach” because it is not always necessary to have all data available at each and every workstation. In this way, we reduce communication expenses to a bare minimum

Recipe management

The recipes contain all of the standard EN 206-1 required information. They are managed centrally in the network. A plant-specific modification allows you to adapt to a single batching plant.

Always in the picture

Data from the selected record are shown immediately on the screen, which saves tedious opening and closing of individual dialogs. In addition, the data can be edited online. When workstations are networked, any editing or change in data records is passed in real time to the other stations in the net. Free arrangement of the spreadsheet columns makes it easy to match the tables to the plant’s requirements. Redundant columns in the sheet can be erased to give a clearer overview of essential information. Another feature of MC 500 is its universal search function, where each column in a data list can be used as a search criterion. Each input of a letter reduces the number of found records.

BATCH **MC 500** Batching plant control system

Daily production

The day's planned production is listed in a table that can be extended at will or kept at just the one day. The same list is used as the basis for printing delivery notes and can also serve to select the requested truck mixer, the amount of concrete shipped out, or the amount of returned concrete. Naturally, multi-mixer plants can run on parallel production of two different recipes. A great boost, especially when one mixer is occupied with special mix designs requiring extended mix cycles. The weighing system, however, will usually be free and can therefore be utilized by the second mixer. Production cycle commences as soon as a weighing system becomes available. If a mixer has two discharge chutes, a priority batch can be mixed and loaded into a second truck mixer while the first one remains in position under its chute.

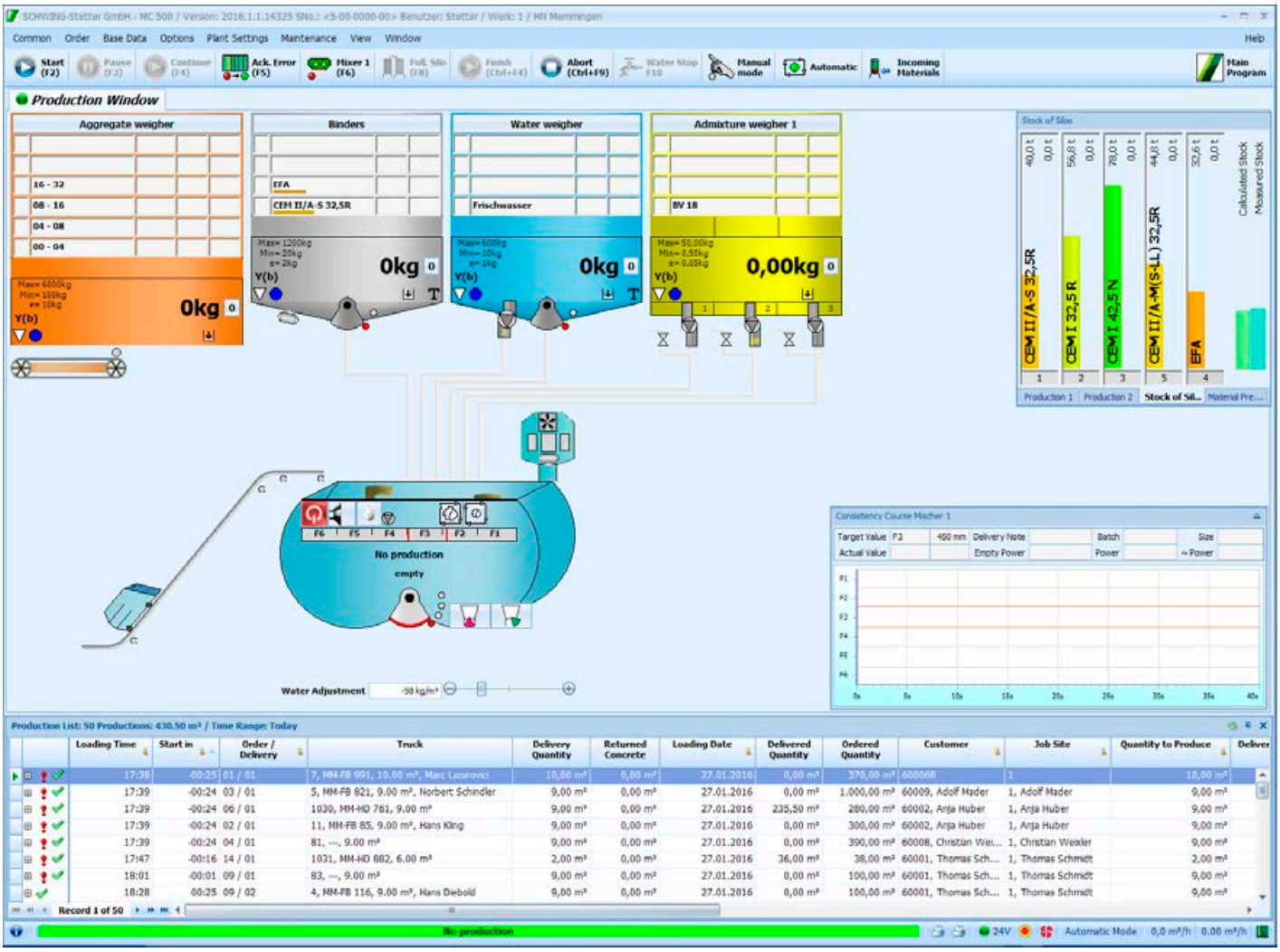
That proves a great advantage in plants that produce for ready-mix and for prefabrication plants.

Alternate silo

As soon as a binder silo runs empty (during production) a mouse-click is all that is needed to call up the next (alternate) silo so that production of concrete can continue without any interruption.

Consistency control

Many applications, but especially prefabrication plants, require exact compliance to predetermined concrete consistencies. The Stetter solution is to meter the consistency in the mixer at the very time of mixing the concrete and to add additional water in small quantities up to the required content.

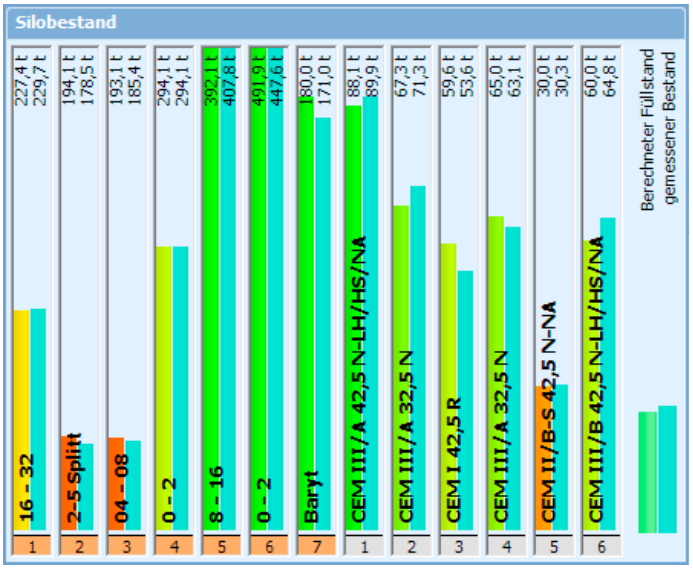


Moisture measurement

Optional moisture probes monitor the surface moisture of gravel and sand and compensate in real time and within the actual quantities of water to be added to the mix. The probes can be easily calibrated using the MC 500 software.

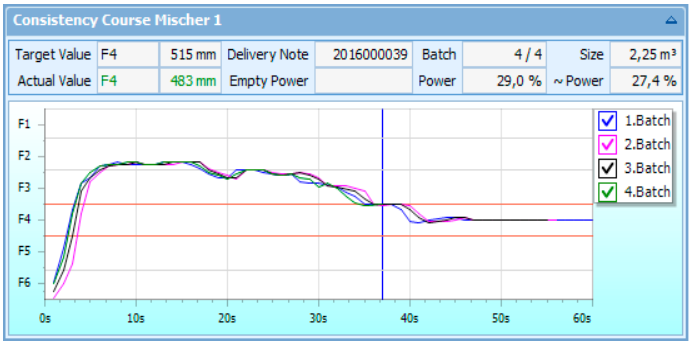
Maintenance function

MC 500-Batch records during production the operating hours and the quantity produced for required maintenance. A list of overdue maintenance work can be printed. With a history function the com-pleted work are documented. With this function, you can prevent effectively unexpected failures of plant components.



Raw material stocks

The graphical display allows level comparing measured and calculated silo stock. The measured level is available only for silos with integrated level measurement.

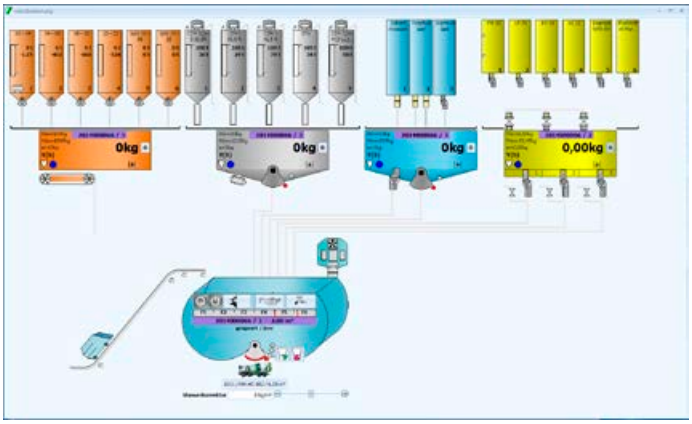


Consistency record

The consistency of each mixer batch is shown in a different color. The calibration of consistency depends on the mixer or of the recipe.

Manual operation (optional)

Of course, additional material can be dosed via a manual operating level. MC 500 registers each a weighed material and designates in the production protocol and in the consumption statistics the weighed components and quantities. So you do not lose any material.



Manual operation per mouse click

With the detailed and animated process visualization, the mixing plant can be controlled manually.

BATCH **MC 500** Batching plant control system

Timing diagram

A graphic display showing the step-by-step processes with the batching plant running in operating mode is especially useful during commissioning and when fine- tuning the plant's performance

On demand, MC 500 records the process chain and maps them in a timesheet form. With this information parameters can be optimized.

Production logbook

Every stage of production and any fault or failure event is strictly registered in the logbook to allow a detailed production analysis at any time.

Delivery note

The delivery note is printed to your specifications, as well as on demand a calibrated delivery note reprint. For different order types (concrete, mortar, etc.), you simply define your own forms.

Grey water consistency

Optionally, you get a gauge for determining the slurry water density. Depending on the density of the slurry water the fines (cement) is automatically detected and corrected for each batch. Alternatively, enter the slurry water density manually.

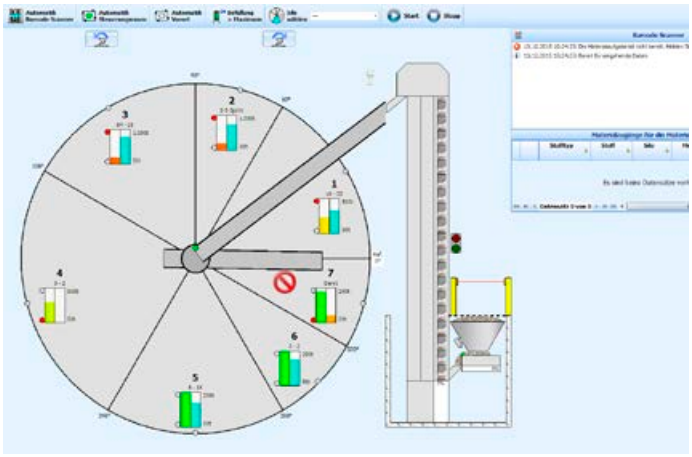
Self-learning in-air compensation

The last runnings of material depend firstly on the material itself and the degree of filling of the aggregate or binder scales. Our MC 500 has a self-teaching program that registers the overrun for each silo and for three different scales fillings.

Sampling schedule

The European standard EN 206-1 stipulates precisely when concrete samples are to be taken and the number of samples required for a particular concrete family.

MC 500 gives the operator a message that a sample needs to be taken. The message is generated from a background program that is continually updated after every single production and is therefore permanently up-to-date. Such a facility is usually part of a separate laboratory software package, but with MC 500, it is already on.

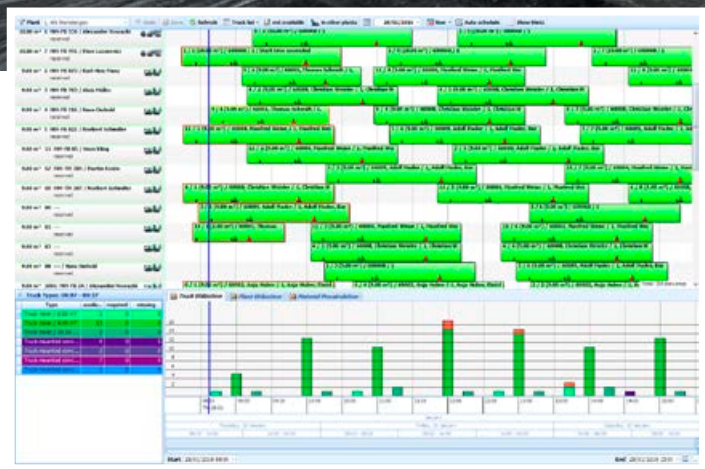


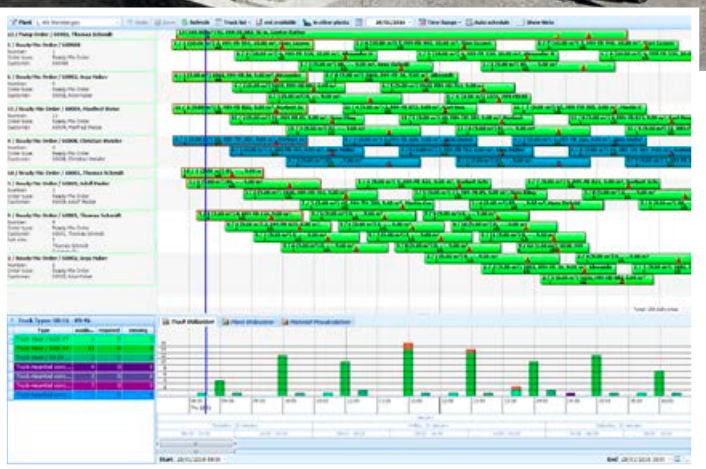
Material Management (if required)

The host computer controls of the filling of aggregate or binder silos. If additional external storage silos are available, then it makes sense to fill the main silos automatically.

Barcode Scanner for recording deliveries of material (optional)

Optional delivery notes of incoming material deliveries can be recorded with a barcode scanner. All necessary information, such as supplier, type of material, quantity and delivery note number will be read and stored in the system. The silo to be filled is then automatically selected. A wrong silo selection is thus prevented. Talk to us, we have ready-made solutions at hand.





MC 500-Disposition

MC 500-DISPO is the answer to production planning problems. When the order is accepted, you determine which plant has to carry out the production. The color display of orders will help you to keep track. With the ability to split single jobs on different plants, may be provided for a uniform utilization of the plants. The scheduling of the trucks is done automatically.

„No-Go“ mixers

The database automatically rules out truck mixers that are not suited to certain job sites. And it takes the drivers' working hours into consideration as well.

Graphically planning of deliveries

In the graphical overview you can see at any time the planned productions. The automatically created plan can of course be modified using the mouse. A simple movement suffices.
If a plant is congested at a certain time, then a delivery or a complete job can simply be assigned to another plant.

Integrated pump fleet dispatcher

MC 500-DISPO not only acts as a plant and truck mixer manager. It can also be used as dispatcher for truck-mounted concrete pumps.
Pump orders can be booked individually or together with a job to deliver concrete. Any changes in mixer delivery schedules are immediately reflected in the time booked for the concrete pump.

Fleet Management System **MC 500**

MC 500-FMS

A useful extension of the MC 500-Dispo is the fleet management system MC 500-FMS. Here your vehicles are equipped with an on-board processor for satellite navigation. Depending on the version, various sensors can be connected.

All the relevant status messages (Arrival construction site, beginning discharge, leaving construction site, arrival work, etc.) are automatically without manual intervention by the driver, generated.

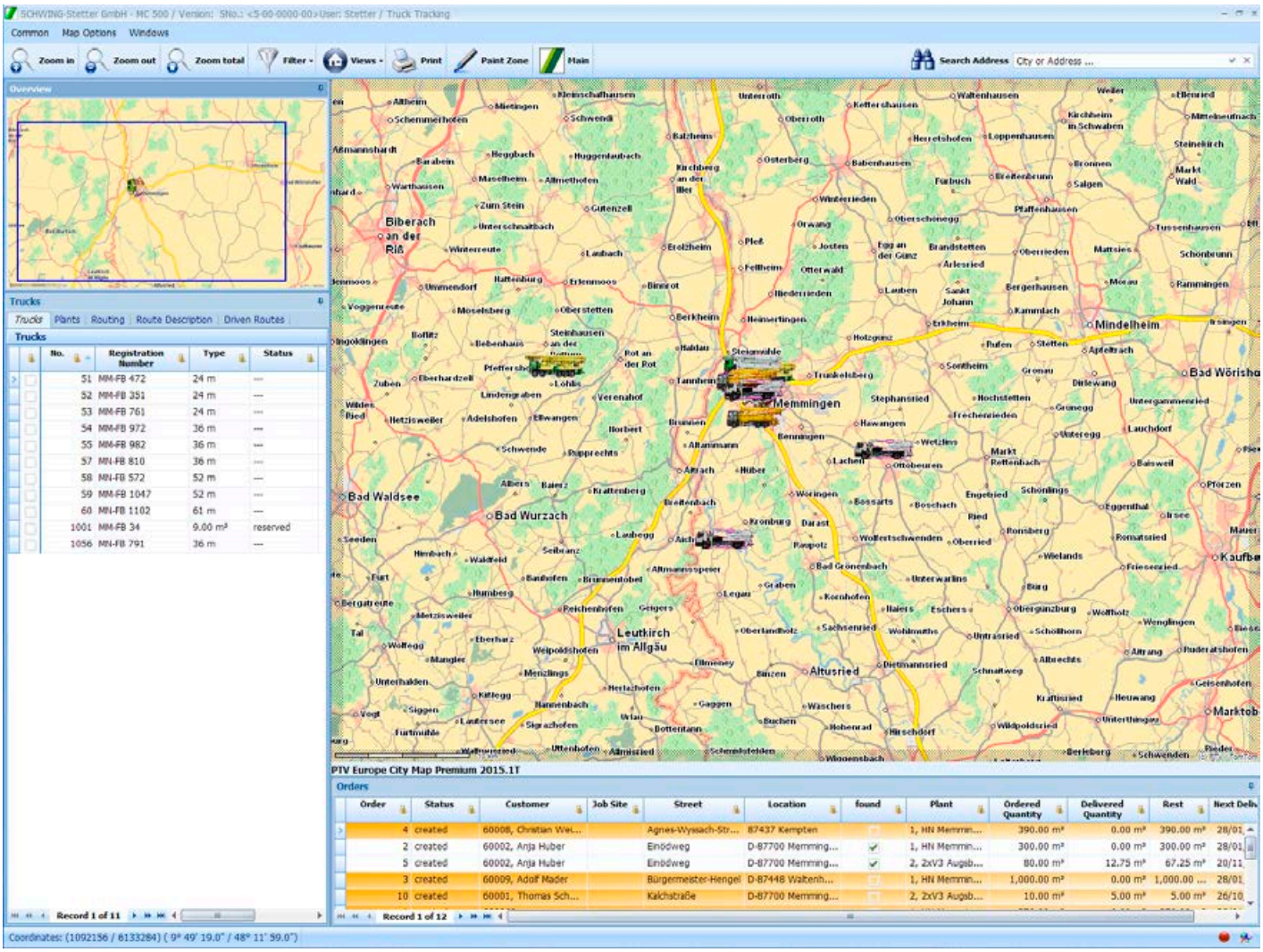
Your benefits: a real overview of the status with a mouse click and no training for the driver.

Close as necessary with the map view

Mit Hilfe von Zoom- und Verschiebefunktionen können Sie den optimalen Kartenausschnitt wählen. Auf einfache Weise können Sie verschiedene Kartenausschnitte hinterlegen und mit einem Mausklick darstellen. Bei der Positionsabfrage eines Fahrzeugs wird der Kartenausschnitt so geändert, dass das Fahrzeug sichtbar wird. Ein zusätzliches Ausschnittfenster hilft den Überblick zu behalten. Es dient Ihnen einfach als Navigationshilfe. Notwendige weitere Informationen wie Fahrzeugliste und Auftragstabelle stellt MC 500 Ihnen ebenfalls zur Verfügung.

Route planner

Mit dem integrierten Routenplaner wird der Weg zur Baustelle sichtbar. Der Kartenausschnitt wird automatisch an die Route angepasst.



FAKTURA **MC 500** Batching plant control system

MC 500-Faktura

MC 500-Faktura has been developed in cooperation with some of the leading suppliers in the ready-mix concrete industry. The result is a tool that is proven in practice and that reflects all of the day-to-day invoicing requirements of companies involved in the supply of ready-mix concrete and relevant concrete pump service

Quotation management

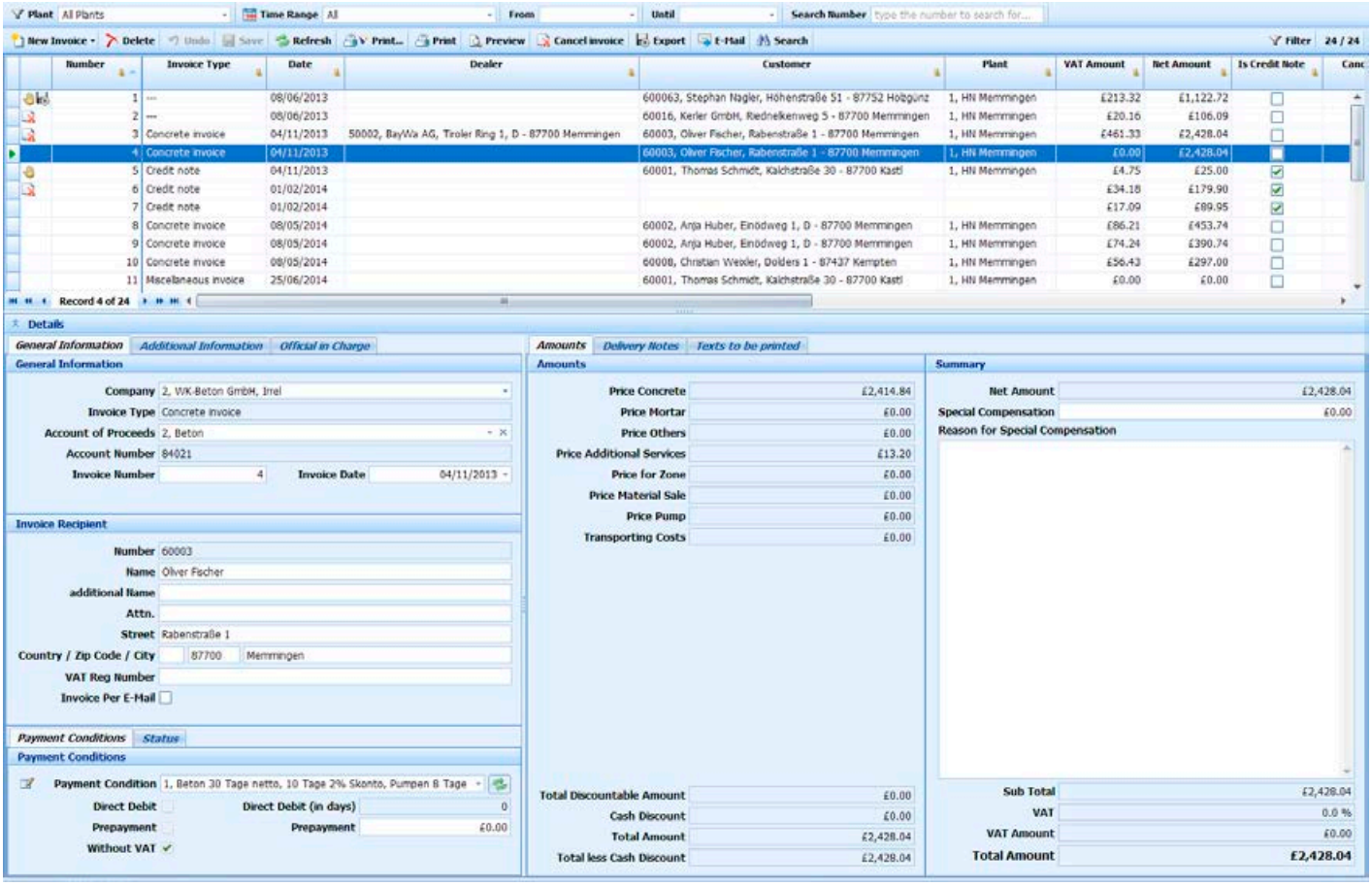
Quotation Management is an elementary tool to compile and follow up quotations. It involves a complete chain of processes from quotation, th-rough production to the delivery note and finally the invoice, taking the customer conditions and terms into consideration at all steps.

Invoicing

There are a multitude of ways to determine the terms and conditions for job sites and customers. Invoices can be compiled either singly or com-bound, depending on your customers' requirements.
There is also the means of issuing invoices for deliveries of concrete and for pump services either singly or compounded.

The fully integrated solution

MC 500-Faktura is an optional add-on module to the MC 500 package. Because of its full integration, data-sets do not need to be imported or exported from allied modules. Everything runs automatically.
Once prices and conditions have been established and archived, they are available to each and every workstation in the company net and can then be used by all of the authorized operators.



Technical Data **MC 500**

MC 500- Database

- Backup of all data on a DVD, a USB flash drive, an external hard drive or on a network computer
- Free selection of data to be printed
- Free arrangement of columns in overview lists
- Automatic width adjustment of the columns in overview lists
- Each column can be defined as a sort criterion.
- All editing functions saved with operator name, date and time
- Logbook function for operator inputs
- Export of displayed records as an Excel file

MC 500- Master Data

- Input of dealers, customers, job sites, salesmen, trucks, subcontractors, drivers, texts, plant data, etc.
- Cross-reference of customers to dealers
- Cross-reference of job sites to customers
- Cross-reference of customers to salesmen
- Display of deliveries to dealers, customers and job sites
- Erase dealers, customers and job sites after day of last delivery
- Warnings or locks for dealers, customers, job sites and mix designs
- Determination of travel times from plant to job sites
- Determination of not possible truck mixers for particular job sites
- Determination of priority truck mixers for particular job sites
- Simple transfer of the address data from the customer data for a construction site
- Comprehensive import and export functions

MC 500- System Data

- Preparation of plant configuration data
- Arbitrary names for the scales, types of materials, types of vehicles, etc.

MC 500- Report Lists

- Determination of the desired reports (lists, statistics, etc.) that are printed regularly

MC 500- Texts

- Input of units (kg, etc.), price and booking code for special services
- Input of special services, adverts, notes, warnings, etc.

MC 500- User Management

- User and user group management with password assignment
- Any number of user groups
- Any number of users
- Determination of access rights for user groups

MC 500- Order Processing

- Arbitrary sorting of order
- Display of total production for the current day
- Order preparation for the next and the following days
- Order creation from the address list (distributors, customers or construction sites)
- Printout of the delivery ticket depending on the order
- Recipe modification order and delivery based (additional cement, additives and water) with input limits, which depend on the user group
- Combination of several orders to one production order
- Automatic planning of the productions
- Preprint and reprint of delivery notes
- Parallel production of 2 orders with different recipes and different prioritization (at concrete mixing plants with 2 built-in mixers)
- Pump orders (singly or assigned to a concrete order)

MC 500- Mix Design Management

- Free selection of dosing sequence for aggregates, cement, additives and water
- Volumetric calculations
- Calculation of aggregate quantities depending on a selected grading curve
- Plant dependant adjustments to the mix design
- Arbitrary pre-mixing times for aggregate, cement, admixtures and water
- Data for DIN ENV 206-1
- Recipe families

- Maximum number of components for the production depending on the concrete mixing plant

Aggregates:	8 of 20 Components (Dosing system 1)
Aggregates:	8 of 10 Components (Dosing system 2)
Aggregates:	4 of 10 Components (Dosing system 3)
Aggregates:	2 of 10 Components (Dosing system 4)
Aggregates:	2 of 10 Components (Dosing system 5)
Aggregates:	2 of 10 Components (Dosing system 6)
Binders:	6 of 10 Components
Water:	4 of 10 Components
Admixture:	5 of 20 Components (Dosing system 1)
	5 of 10 Components (Dosing system 2)
Color:	2 of 10 Components
Ice:	1 Component
Silicate:	1 Component
Steel fiber:	1 Component

- Optional: concrete sampling schedule
- Optional: automatic message for required concrete sampling
- Optional: calculation of warm water quantity or quantity of ice depending on the current temperatures of the materials used (requires an automatic temperature measurement for each material)

MC 500 Batching plant control system

MC 500- Raw Material Management

- Input of material designation and article number
- Input of material density (for volumetric calculation)
- Determining the moisture content of admixtures
- Manual determination of the moisture of aggregates
- Input of grading curve data for mix design calculations
- Determination of material - silo assignements
- Determination of alternate silos
- Limit points coarse/fine
- Determination oft he tolerance limits
- Automatic calculation of the quantity of retarder for required retarding time
- Supplier and material management
- Optional: Recording deliveries of material with a barcode scanner

MC 500- Dosing Program

- Production logbook (incl. all messages send and received during production)
- Automatic determination and calculation of the amount of solids in the sludge water and taking them into account during production
- Alternate silo switchover
- Automatic control of scales
- Mixer double-filling protection
- Automatic, self-teaching in-air compensation
- Batch optimisation
- Shutoff flap monitoring
- Automatic skip pre-start calculation
- Moisture metering of up to 6 components with sand moisture correction
- Air blow-out of additive lines
- Water pre-dosing
- Consistency graphic on display
- Monitoring of continuous silo levels
- Parallel production with prioritization
- Archiving of delivery data and batch records as a PDF file
- Up to 15 scales
- Optional: maintenance function

MC 500- Statistics

- Archive (delivery notes, batch data, production logbook, etc.) of all data to allow statistics to be generated over any relevant time period.
- Production statistics with details of average plant output
- Dealer, customer, customer mix design, truck and mix statistics possible with printout of all deliveries
- Production statistics for day, week, month, year or any other time-frame
- Number of trips for each truck mixer in respect of a set time frame, including average load
- Target / actual consumption with calculating the deviation in % and in tonnes
- Material consumption over any period
- Material consumption via manual operation
- Delivered quantities to dealers, customers, job sites, truck mixer, etc
- Special statistics on request

MC 500- Available Languages

- English, German, French, Russian and Chineese others on request

MC 500- Option

- Manual operating tableau
- Extension to four monitors
- Remote service (assistance in the operation, adjustments are made via an Internet connection. Thus, a fast response time during maintenance and service tasks is possible.)

Technical Data **MC 500**

MC 500-Dispo – Order Management

- Determination of production plant
- Splitting of orders over several plants
- Automatic planning of the productions
- Material requirement calculation
- Exchange of orders between plants without central server
- Considering blocking times of vehicles and drivers
- Trucks and truck groups can be blocked for job sites
- Considering the maximum permissible total weight at the job site or on the route

MC 500-Dispo – Disposition

- Graphical display of deliveries for one or all connected concrete plants
- Free planning by simply moving the deliveries with the mouse. In a simple way, a delivery can be assigned to a truck in the same or in another plant.
- Plant utilization
- Truck utilization
- Display of time until required start of production
- Integration of a truck tracking via GPS (requires MC 500-Map)
- Manual status editing of truck mixers
- Automatic updating of travel times to job sites and plants (requires MC 500-Map)

MC 500-Dispo – Pump Disposition

- Management of pump orders and pump delivery notes
- Interlinking of concrete deliveries and pump orders

MC 500-FMS

- GPS truck tracking with map display
- Display of plants, job sites and trucks on maps in a freely selectable scale and map area
- Storing frequently used overviews
- Print out the current map section
- Fully automatic transmission of truck status
- Display of trucks with actual status
- Display of routes travelled in time-frame by particular trucks
- Automatically search the job site address with correcting the GPS coordinates and address data
- Storing the status data with the exact time to update planning data
- Interpretation of truck position with signals “arriving job site”, “starting unload”, “leaving job site” and “return to plant”

MC 500-Sync – Database Synchronization

- Freely configurable, it is determined which data is exchanged with which plant
- Minimal traffic, because only the changed fields are transmitted
- Exchange of data between the plants without a central server
- Easy linking to further plants at a later date

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MC 500-Faktura – Base Data

- Management of price lists and payment terms
- Dealers, customers, job sites and plants with its own price lists
- Dealers, customers and construction sites with general discounts on the standard price list and with individual product prices

MC 500-Faktura – Pricing

- Price lists include recipe prices, prices for special services, prices for delivery zones, material prices and pump prices
- Free selection of price lists to dealers, customers, job sites
- Free selection of conditions to dealers, customers, job sites
- Free assignment of discounts for selected articles to dealers, customers and job sites
- Pumps with basic price, minimum price scale prices
- Free assignment of pump prices and discounts to dealers, customers and job sites
- Discounts for dealers, customers, and sites with a validity date
- Automatic calculation of production costs of the recipes
- Transport costs depending on the truck and the distance

MC 500-Faktura – Quotation

- creation of quotations
- Determining the validity period for quotations
- Automatic Resubmission
- Creation of orders from quotations with cross-reference to agreed discounts

MC 500-Faktura – Delivery Note Editing

- Correction of special service, waiting times, concrete returned to plant, additional cement and admixture quantities
- Creation of pump delivery notes
- Optional: Import delivery notes (on request)

MC 500-Faktura – Invoicing

- Collective invoices
- Customers with optional invoice per job site
- Individual job sites may be excluded from the collective invoice
- Considering the discounts of dealers, customers, construction sites
- Considering the price lists
- Alerting when the validity date of the price list has been exceeded at the time of invoicing
- Invoice printout (printer, preview or PDF file)
- Optional: Creating an export record for transmission to a financial accounting software (DATEV, custom format)
- Credit notes
- Sale of raw material
- Pump invoicing
- Other type of invoicing

MC 500-Faktura – Statistics

- List of issued invoices
- m3, turnover per dealer, customer, job site, etc.
- Further statistics on request

SCHWING-STETTER
ALWAYS CLOSE TO YOU

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