



Basic modules

For the smart start into the digital future

The **basic modules of the MES Software EMC** form the foundation of the **digital factory** and enable a simple and fast **digitalization of manufacturing**. In addition to the automated and error-free **acquisition of machine data** and evaluations of machine downtimes, complete **order information can be made available directly at the terminal**. Comprehensive monitoring as a **view into production** and real-time evaluation of the recorded data in the form of **reports and analyses** round off the intelligent features of the basic modules.

EMC.Services

The foundation: Reliable. Flexible. Fully updateable.

Our MES Software EMC works on the basis of a **uniform system platform, the EMC.Services**. They are the **stable foundation of your digital factory** and the backbone for all basic and advanced modules for uniform data management and reliable information exchange.

The **intuitive, web-based EMC.Portal** provides fast access to the modules of the MES Software EMC. It makes use of all data and information taken from a **central database structure**, provides real-time data and ensures that the **numerous functions are used reliably**. All assignments, configurations and settings can be **easily organized and adapted** here and are **immediately available** to the integrated modules. Additional modules and applications can be added as required during operation.

EMC.Services and **EMC.Portal** have been designed to **adapt completely to the needs and requirements of your production** - without losing the **high standard**. In this way, we ensure that our software EMC is **individually adaptable to every application operation** and functions optimally with **full data consistency**.

The user thus benefits from an **innovative, consistent and uniform user system**.

Our MES Software EMC was **developed with state-of-the-art software development tools and is continuously enhanced**. This means that you are

always one step ahead, even with the ever-changing demands and requirements of customers and markets.



Innovative & modular MES software with a high degree of standardization for a holistic and future-proof MES solution that adapts and constantly grows with you.



State-of-the-art software development from Germany for MES software with the highest standards, optimal performance and intuitive use in the digital factory.



Fast and flexible implementation during operation by our team of specialists and software developers with around 30 years of experience and expertise.

Basic modules

The key features for the start of your digital and smart networked manufacturing

The key to networked manufacturing is successful digital transformation. The goal is to effectively close the gap between management and manufacturing with **smart networking**.

Reliable collection, bundling, visualization and evaluation of data on the stopfloor is essential. It doesn't matter how old or intelligent the machines are or what the current IT landscape looks like. Our innovative MES Software EMC uses four basic modules with a wide range of functions as standard to create the optimal foundation for your digital factory.

With **EMC.MachineDataAcquisition**, machine data is captured automatically and error-free, and evaluations of machine failures are made visible from this.

With the help of the basic module **EMC.OperationalDataAcquisition**, complete order information is made available directly at the machine terminal, thus facilitating data-driven work in production.

EMC.Monitoring provides a comprehensive „view into production“. The data of the machines, orders and employees are brought together and inform at any time about the current status of the production.

Meaningful reporting and analysis with real-time key figures via the basic module **EMC.Reporting** rounds off the important basic functions of the MES Software EMC.



EMC.MachineDataAcquisition

Capture of machine conditions and instant stillstand identification



In the **digital factory**, the current status and condition of machines and orders is determined automatically - **uninfluenced by the human factor**.

The **basic module EMC.MachineDataAcquisition** automatically records the produced quantities and volumes in real time. **Time-consuming, inaccurate and error-prone manual data entry is replaced**. The machine data is visualized directly at the machine via an **MES terminal**.

By recording the machine signals, plant malfunctions as well as production and downtimes can be detected immediately. Reasons for malfunctions can be easily stored **at the actual time at the touch of a button**. On the one hand, this saves the subsequent documentation of reasons for malfunctions after the end of the shift and, on the other hand, the **production processes can be fully traced at any time**.

The following is reliably recorded

- the **actual state of the machine**
- the **error information**
- the necessary **interventions of the machine operators**
- **parts counter**: good parts counter, scrap counter, container counter
- the **maintenance status of the machine** (service, inspection, repair, upgrade)

Capture with OPC/UA

Newer machines are recorded with the OPC/UA interface or with modern controllers such as Siemens S7.

- OPC/UA (Open Platform Communications - Unified Architecture)
- Plug in the network cable and the data acquisition starts directly

Capture without OPC/UA

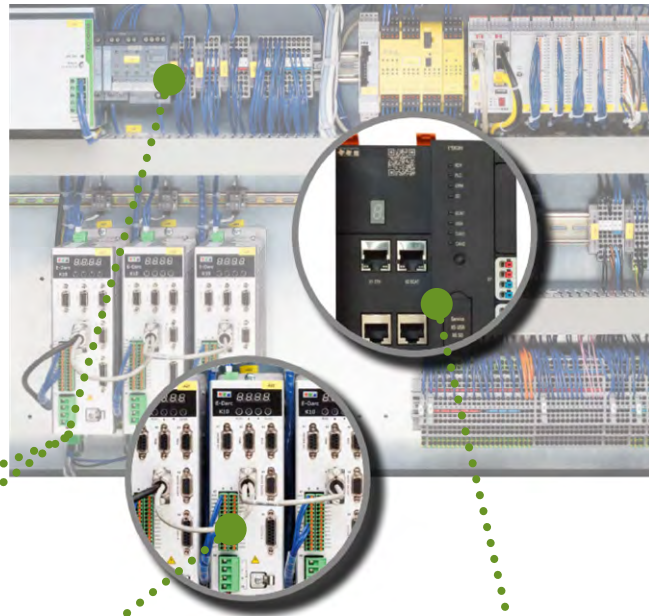
Plants with older controllers are recorded with IoT modules. The IoT modules are intelligent and can, for example, derive the machine status from clock signals.

No programming is required for this. This is configured with intelligent mapping and enables **the complete machine park to be recorded automatically in a cost-efficient manner**.

Connectivity solution

Machines of different manufacturers and ages? It does not matter how old or intelligent the machines are. **For older machines**, the recording is done via 24V signals (stroke, clock, faults), for which IoT gateways are used. **For newer machines**, it is done via the Industry 4.0 interface **OPC/UA**.

In addition, the **data of the periphery**, e.g. of the tool monitoring, of the reel or of the test devices, are also recorded in **EMC MachineDataAcquisition**.



- Set up
- Production
- Interruption

The collected machine data is **interpreted and visualized**. These are **combined with external data** and make production performance visible on the machine terminals and via dashboards.

Seamless integration into your network architecture via cable or WLAN

The data collected from the machines is **compatible and directly networked with the existing ERP system**. The reliable networking and provision of data with the existing ERP system enables a **continuous improvement process** and a **reliable and always up-to-date overview** of all machine statuses, reasons for downtime and **key figures such as OEE**.

EMC.OperationalDataAcquisition

Complete order information in real time



Not all data can be read by the machine such as downtimes whose reason lies in the organization or, for example, waiting for quality assurance. With the **basic module EMC.OperationalDataAcquisition** this data can be entered directly at the terminal on the shopfloor and monitor your orders and the individual operations at the same time. **All relevant order-, article- and person-related data is thus recorded seamlessly in real time** and reported back to the ERP system. In addition, operating data can also be reliably recorded, e.g. during assembly or at manual workstations, completely without machine data.



The **MES terminals on the shopfloor make it easier for workers to work**. They provide information about **current and planned orders** and are easy to operate thanks to a **self-explanatory user interface with touch screen function**. Workers are relieved of handwriting and have a record of their work.

FUL 36+

0350

Order number: 0350
Article: W - 350

Shift	Performance (machine)	Order
Target quantity	0	Quantity
Good quantity	11109	126000
Reject quantity	0	2531285
Total	11109	2531573
Forecast	11034	Rework
Shift number	Out of shift	0
	OEE [%]	12:33
	Productivity [%]	294:15
		Time planned
		294:15

Production Time: 01:55:09

Machine status Add interruptions

Main interruption reasons	
personally	>
Check pilot series	
Material breakage	
Tool	>
Material shortage	
Intermediate control	
Place material	
Machine damage	

Setup >

Production >

Activate personally >

Order and article-related data can be easily and reliably recorded via the MES terminal directly at the machine:

- Logging on/off, interrupting, and partial of orders/operations
- Recording of good piece and scrap figures
- Recording of personal times
- Recording of material and consumption batches



The recorded actual data from production is reported directly back to the ERP. In real time, the MES Software EMC displays all important order-related information in detail:

- Current status of orders and operations
- Interruptions and order progress
- Comparison of target and actual values
- Order backlog and order sequence

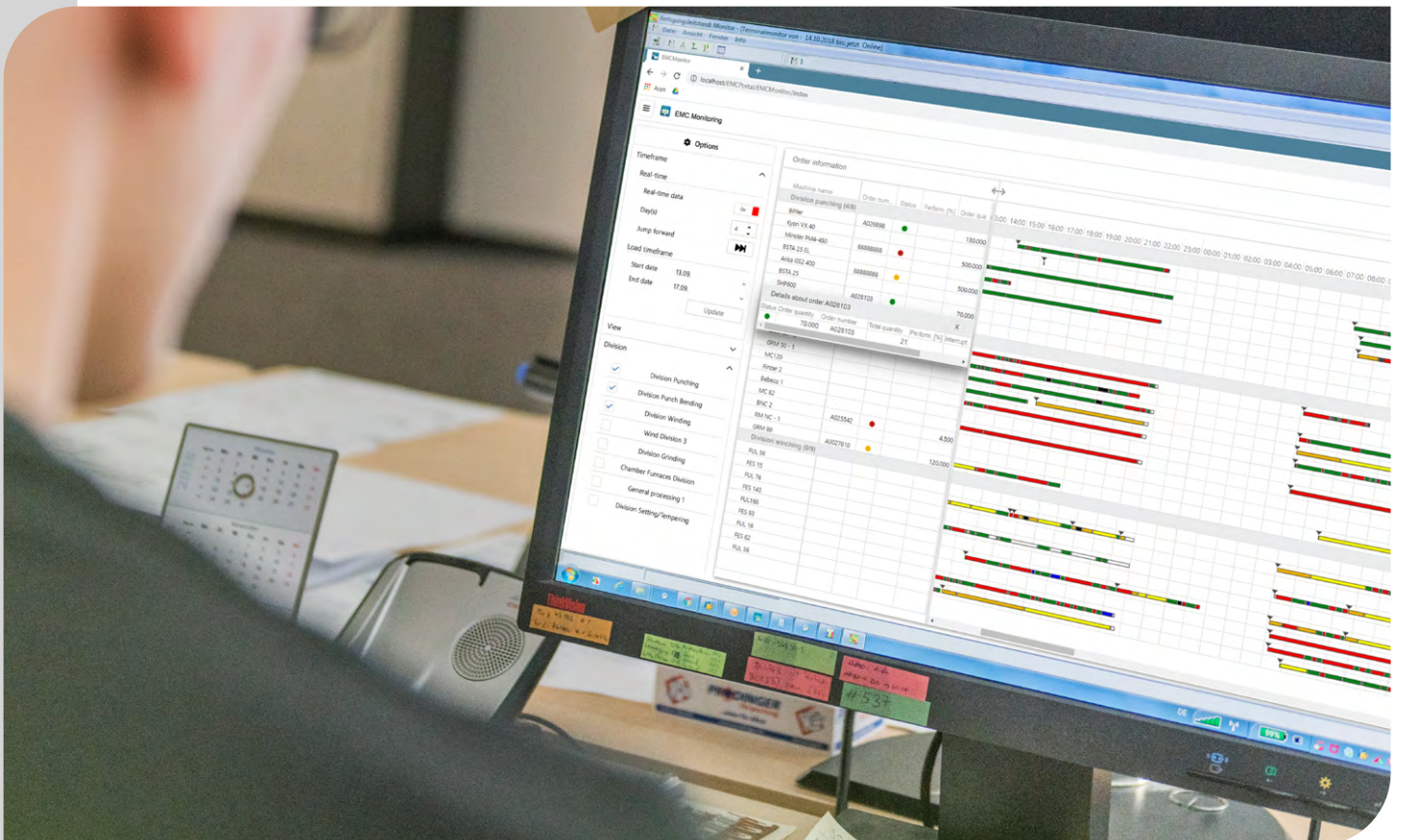
EMC.Monitoring

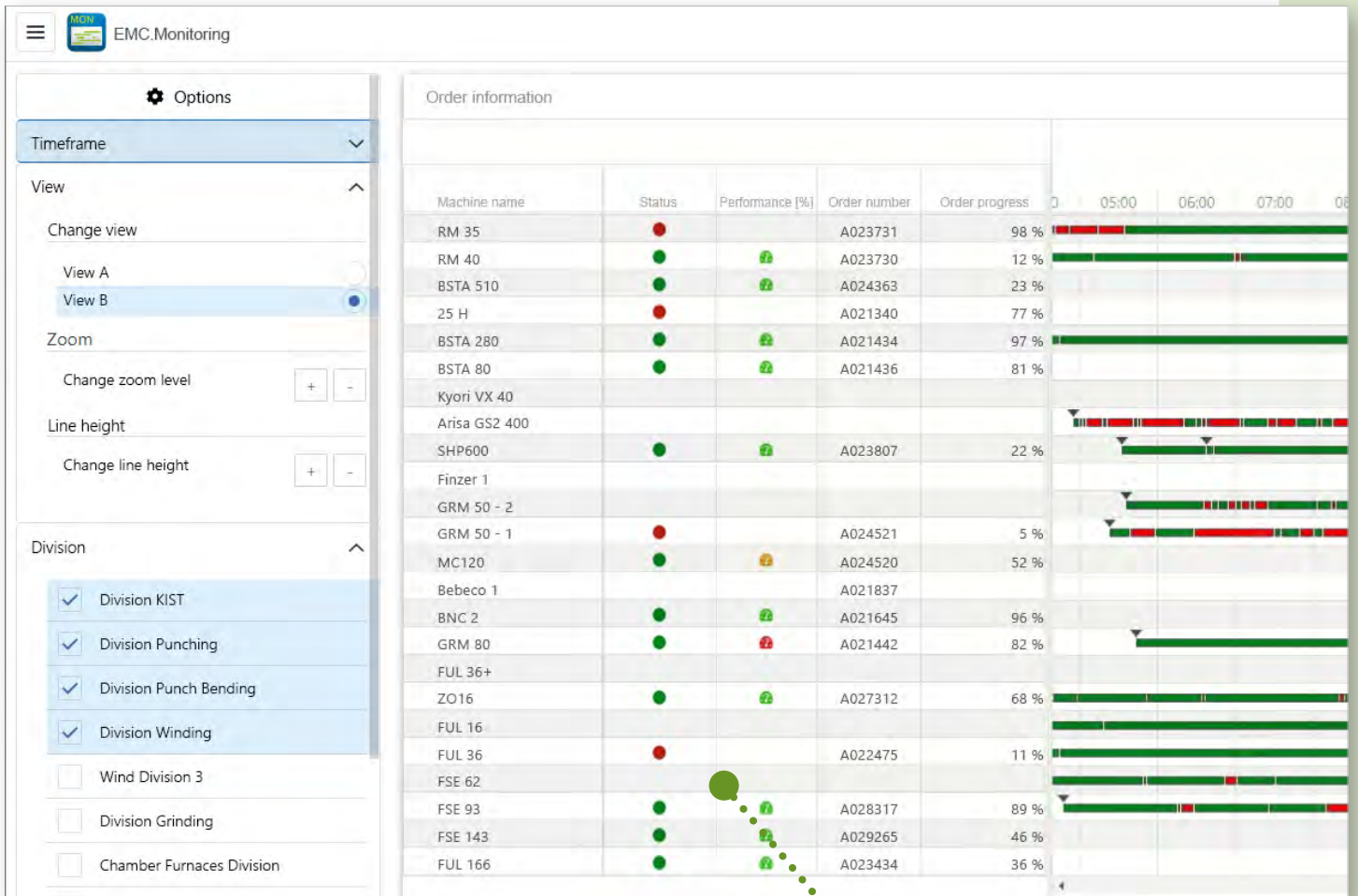
The view into the production – in real time



With the **basic module EMC.Monitoring** you have **the production in view at any time**. The collected and bundled production data is **visualized in real time in a target group-oriented manner via a production monitor, PC or mobile device**. Thanks to the **location-independent access** to the important production data, machine downtimes, reduced speed, quality losses as well as plant malfunctions can be **detected immediately at any time**.

The timeline in **EMC.Monitoring** shows the user the **complete production process** from the past to the present. Which values and order information are displayed is freely configurable. For example, you can see the **current status of the machines** at a glance. Via individually configurable, colored dots, each machine status can be assigned its own color and thus **interruption reasons can be quickly identified**.

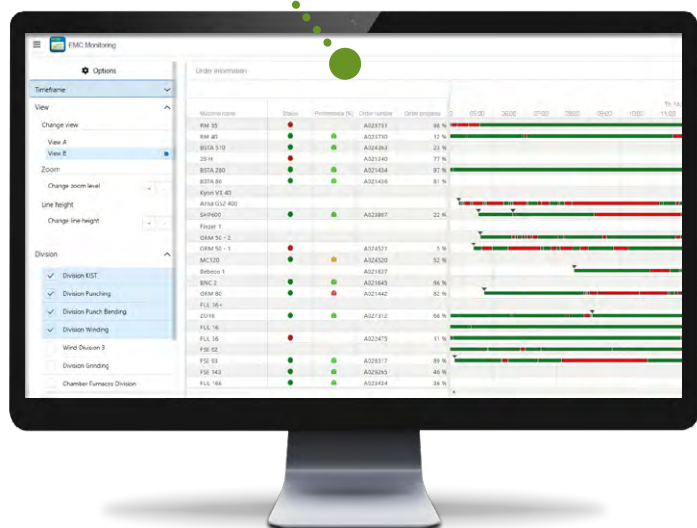




In the left **configuration menu**, which is also individually configurable, the **machines can be easily grouped by department**.

It is also possible to customize the display of information **for different users** so that everyone sees what is relevant to them. Details and status information can be easily shown and hidden by double-clicking or mouse-over.

With **EMC.Monitoring** you always have the **full spectrum of production in view** - without being in production yourself.



EMC.Reporting

Meaningful reportings and analyses with real time KPIs



The **basic module EMC.Reporting** generates clear reports in the portal, designed for decision-making, from which you can derive the appropriate optimization measures for machines, orders, articles and personnel.

With **important analyses** such as OEE of machines, setup degrees, downtimes of machines, plan-actual-time analysis of articles or **productivity key figures, risks and potentials can be identified quickly** and thus enable an easy control of the **continuous improvement process and tracking of the target achievement**.



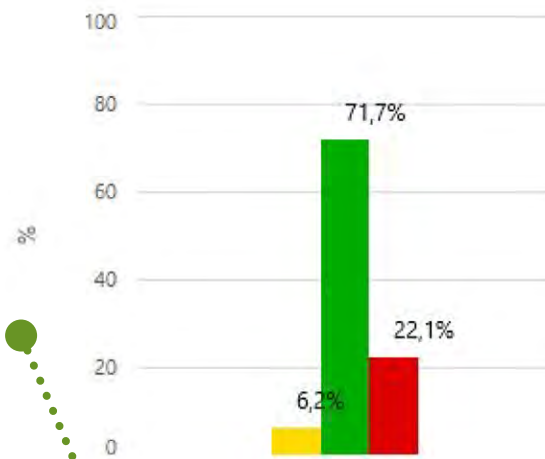
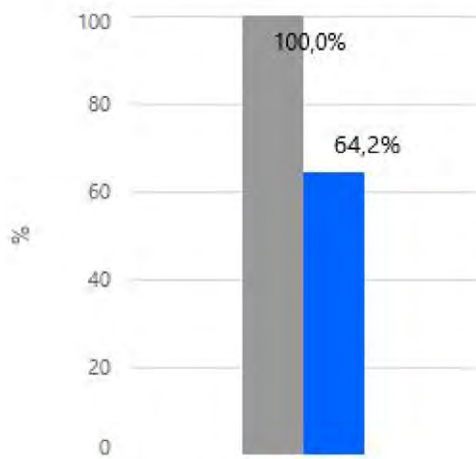
Machine evaluation

From: 13.02. To:

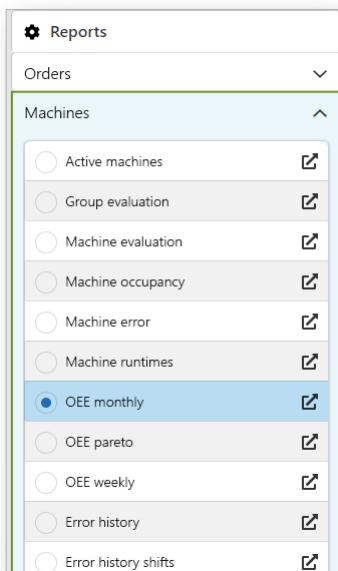
Shift: All

Division: Division Punching

Arisa GS2 400; BSTA 80; Kyori VX 40; SHP600



Technical as well as organizational reasons for downtime (e.g. missing material) and their **interruption times can be easily evaluated** at any time.



Exact machine running times and setup, production and interruption times supplement the all-round view. Weak points can thus be quickly identified and enable the targeted use of optimization measures.

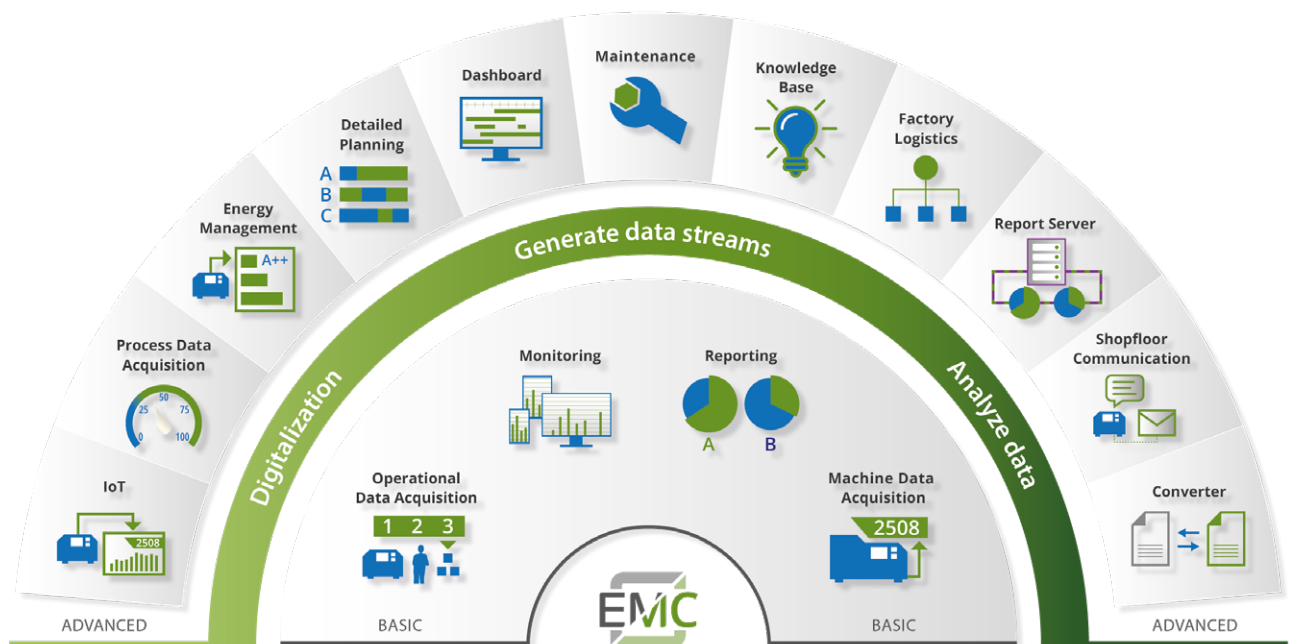
In addition to the machines, the **EMC.Reporting module** offers a **variety of other evaluations**, e.g. for individual articles. The **comparison of planned and actual time per operation** quickly points out deviations. In the detailed view, **all evaluated individual orders** are listed. **For each order, the planned/actual times and quantities are listed** with details of the operation and the respective machine.

MES-Software EMC

The solution for your smart networked manufacturing

Our user-friendly MES Software EMC controls all digital processes on the shopfloor **from planning, implementation, maintenance to traceability, shipping, production orders and a sustainable evaluation.**

It adapts completely to your needs, integrates into your existing IT landscape and brings together the data streams from ERP and the shopfloor.



The modular architecture of the MES Software EMC offers you the important **freedom and flexibility** in the implementation of your future-oriented production. Together with the **central MES database**, it is the basis for a **customer-oriented implementation - step-by-step or holistically - individual modules or as a complete system.**

No matter which solution you choose, with EMC you are always one step ahead and have the **best possible transparency** in production. All with the aim of **increasing your efficiency.**

Advanced Modules

The perfect addition for the digital factory

In addition to the basic modules, the MES Software EMC offers a **wide range of advanced modules** for a **holistic implementation of the digital factory**. They can be combined in any way and are perfectly coordinated with each other to network the processes on the store floor in a **uniform, digital and effective** manner.



Dashboard

Current status of production directly on the shopfloor

Clear presentation of the most important core statements for the shopfloor. A variety of live dashboards with real-time information and forecasts can be created, configured and visualized for every employee via large-screen monitors.



Detailed planning

Machine updates planning

Detailed planning finely schedules orders to each production machine based on the costing data from the operational ERP and monitors the current process activities. The real-time data is specifically controlled and used. Continuously, the planning is compared with the production progress, deviations are calculated, visualized and automatically updated.



Maintenance

Maintenance of machines and tools

Complete, digital documentation of maintenance and repairs in the digital life cycle map. Central management of maintenance plans and definition of maintenance cycles for preventive maintenance.



Knowledge Base

Bundle information and make it available - without paper

Bundle predefined job information and make it available everywhere. Important documents can be displayed directly at the terminal. Quick and easy addition of information directly at the terminal on the shopfloor.



IoT

Modules for networking and visualization

For networking new plants, we rely on innovative standards such as OPC/UA. For existing machines, easily programmable IoT gateways to the machine controller, to the control cabinet or to the sensor are the solution. Touch terminals or mobile devices are used for visualization.



Process Data Acquisition

Monitor processes and documentation

Process data to be recorded continuously, such as temperatures, currents, pressures, etc., ensure quality assessment. The data is acquired event-driven or by a freely configurable time triggering. Gateways enable standardized reading of the values.



Shopfloor Communication

Easily share information on the shopfloor

Simply exchange information via chat and thus simplify workflows. Important decisions can be made directly at the machine terminal. Be informed by SMS or e-mail in the event of malfunctions and machine downtimes.



Factory Logistics

Complete traceability of products and containers

Reliable traceability of products, components and batches in real time Order data including the container number are written to an RFID directly at the MES terminal. This means that each container is clearly identified and can be easily located at any time.



Energy management

Detect energy consumption

Optimal support for the collection, visualization and evaluation of energy data. With the end-to-end recording of machine and energy data, energy wastage can be reliably detected and clearly allocated.



Report Server

Creation and distribution of meaningful reports

A variety of reports can be created, visualized and individually configured from the collected data. This enables detailed analysis and evaluation for the entire store floor, which contributes to evaluation and the continuous improvement process.



Converter

Communication with the ERP

Continuous bidirectional data exchange to enable access to the order and article data and to provide the ERP with the data from the store floor. The data exchange is freely configurable and independent of the respective ERP system.



iT Engineering Manufacturing Solutions GmbH is your provider of a well-developed Manufacturing Execution System in production management.

As an IT and MES expert in the metal forming industry and thanks to our large network of partners and memberships in associations (including VDFI and netzwerkdraht e.V.), as well as the best contacts with machine manufacturers, we know exactly how to obtain the important data and how to use it to digitalize processes and thus increase efficiency and productivity in manufacturing.

Our MES Software EMC acts as a central information hub and, by integrating the production data, ensures integration of production data for transparent production processes, flexibility and cost efficiency.

With a high level of technical and industry competence as well as many years of experience and expertise, we accompany you personally and step by step in transforming your production into a digital factory.

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WE ENABLE SMART MANUFACTURING