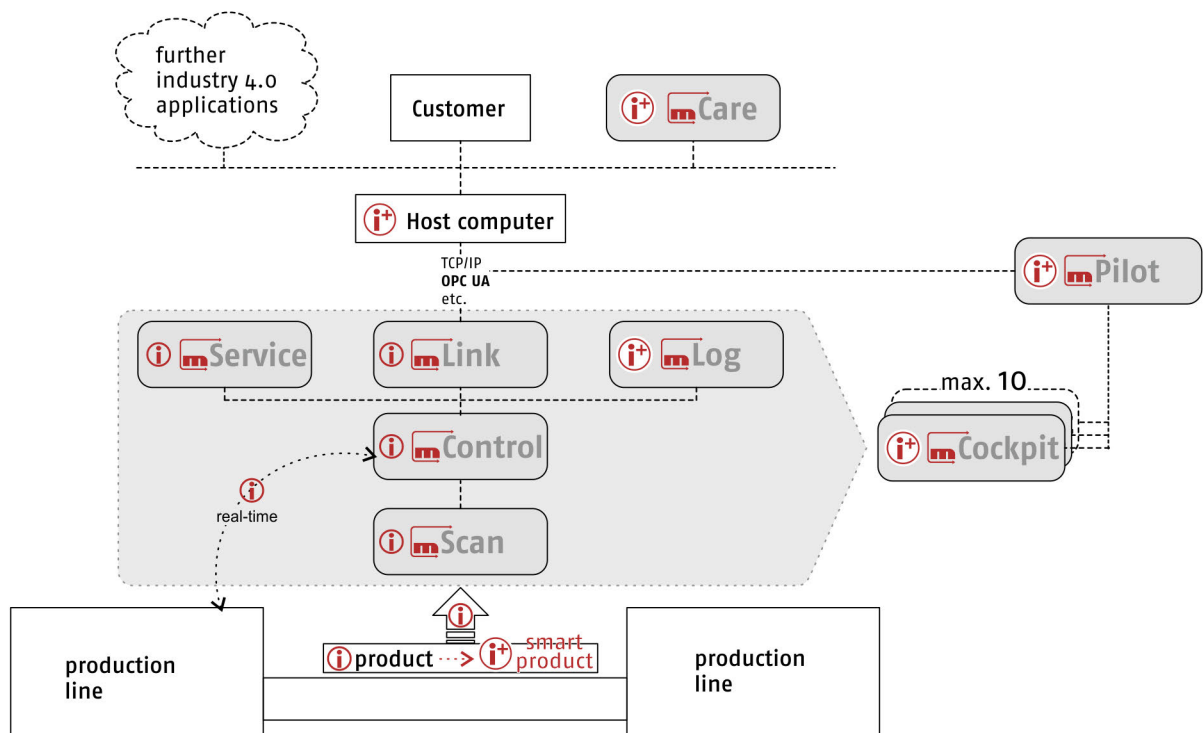


Smart

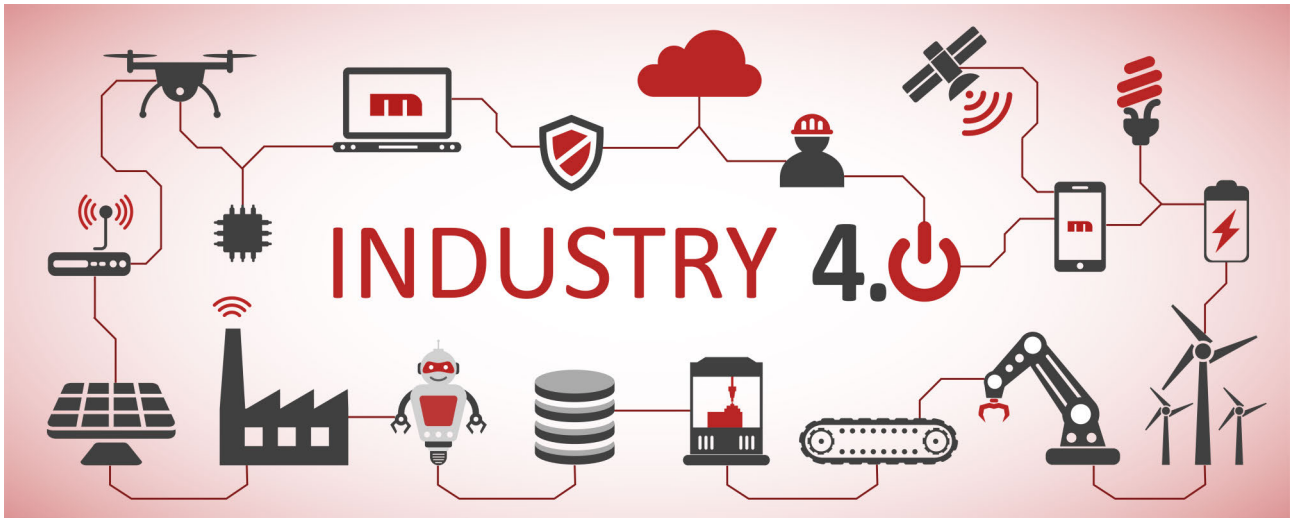
Mahlo's industrial concept for digitalisation

Gateway to Industry 4.0



mSmart

DIGITALISATION – CHALLENGE AND OPPORTUNITY



Industry 4.0 is on everyone's lips – all processes are networked with each other

Digital technologies have become the key to economic success. Used correctly, companies can retain regular customers more closely, win new customers or develop new business models. Digitalisation can also help companies to improve their competitiveness, react faster, work more efficiently and save time and money.

However, the ever faster changes in markets and business relationships also present companies with major challenges. The intelligent networking of people, machines and processes holds some difficulties in store. In order to connect manufacturing processes with the digital world in a targeted manner, some changes and efforts are required in the company.

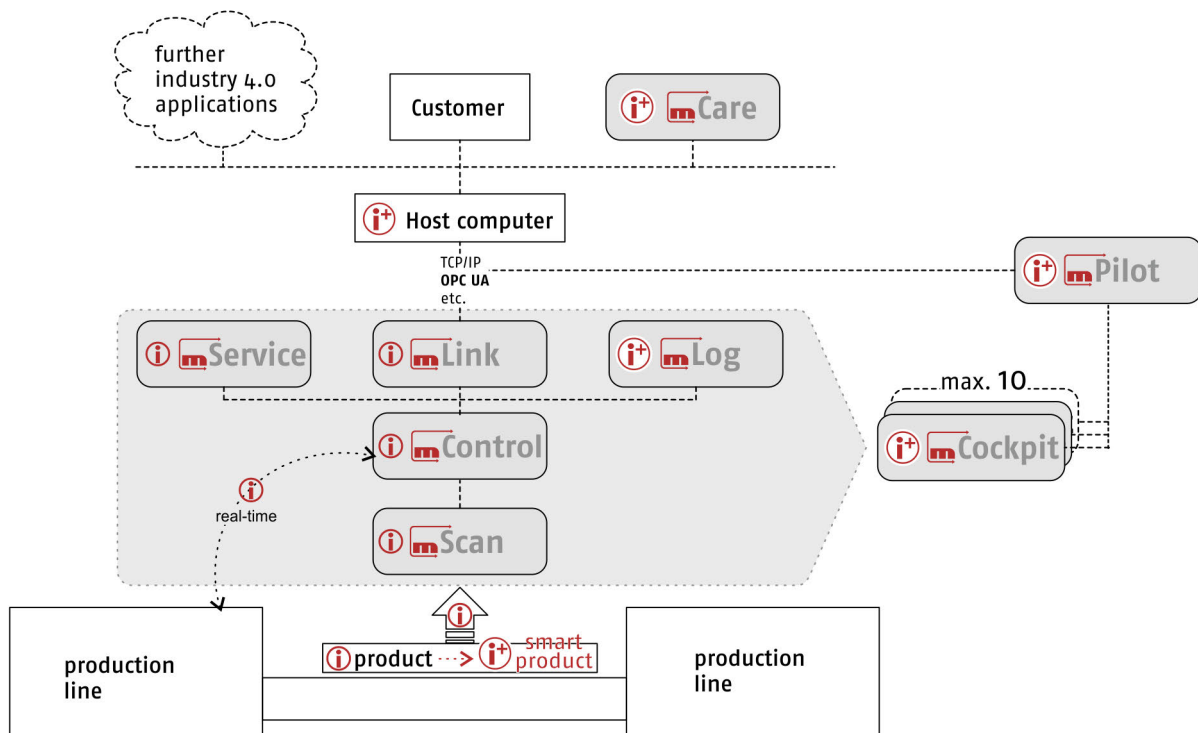
The key points are the correct collection, analysis and treatment of the right data as well as the seamless transition of data flows between machines, company divisions and to other companies such as customers or suppliers.


Mahlo offers a cross-system solution with easy entry and effortless scaling.


mSmart – INDUSTRIAL DIGITALISATION FROM MAHLO

Mahlo equipment and systems are at the heart of manufacturing and finishing processes for web products.

Basic functions are the continuous measurement and control of important product parameters in the running process. Intelligent sensors provide measurement data with optimum quality. The processing of the data in control algorithms for controlling actuators, adapted to the respective process, ensures the best possible production results.



 - Information (measurement data) recorded and processed by the Mahlo device

 - Information enriched with context information by mLog and mCockpit for evaluation and further processing

User-friendly visualisation, the preparation of data in the form of protocols and flexible evaluations increase the benefits for the customer. Simple and secure integration into production processes and higher-level computer systems allows unhindered data flow.

The basic ideas of Industry 4.0 have always been the basis for Mahlo's business model and products. The use of new digital technologies on the modular mSmart platform is a logical and consistent development step for Mahlo – always with concrete customer benefits.

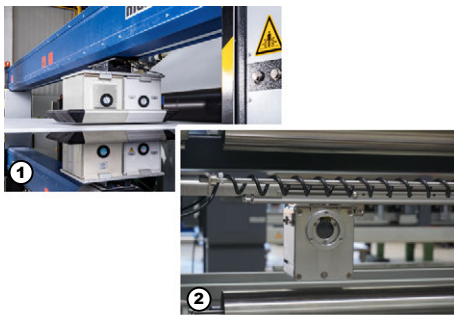
MSMART – BUILDING BLOCKS OF THE CONCEPT



mSmart categorises the individual functions and merges them into one system environment. All services for data acquisition can be found in the category mScan, all control tasks in mControl. The module mLink is responsible for networking, mLog for data logging and evaluation. Services are bundled in mService and mCare facilitates communication with our customers. All of this can be comprehensively displayed and operated in mCockpit, the visualisation module. mPilot combines up to ten Mahlo devices and monitors them from a control station.

The open concept thus runs through Mahlo's entire range of products and services, regardless of the application, industry or purpose.

The Mahlo platform ensures expandability, interoperability and sustainability through open interfaces and specifications. The functionality is continuously expanded.



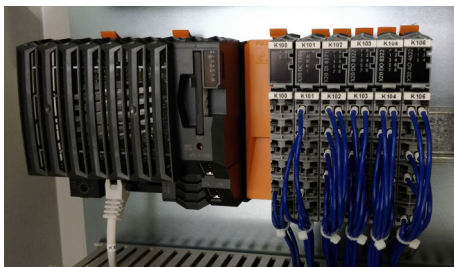
mScan sensors provide the data basis

- 1 Qualiscan QMS
- 2 Scanner of the Orthopac RVMC

The category mScan includes all tasks for data acquisition by sensors. Intelligent sensors with mScan technology record product and process parameters online. The measured values are processed directly in the real-time processors of the sensors. The finished measurement data is transmitted internally in the Mahlo device or via network cables to the mControl module.

If no mControl module is used (i.e. no control), the data is transferred via mLink to other modules or, if connected, to external master computers.

mScan includes sensors and components used for data acquisition, e.g. the scanners of Orthopac straighteners or the sensors of the Qualiscan QMS.



mControl components control production lines in real time

The automatic control mControl reduces the spreading width for the measured parameters and thus guarantees a more uniform end product. This allows optimised target value specifications and, in addition to better product quality, leads to significant savings in raw materials and energy costs. In addition, process reliability and production throughput increase.

Real-time control:

The intelligent mScan modules and the integrated networking and communication enable the optimisation of the smallest process steps in real time.

The mControl category includes all Mahlo controllers, such as the controller components of the Orthopac control system.

mLink



mLink components network devices with different data protocols

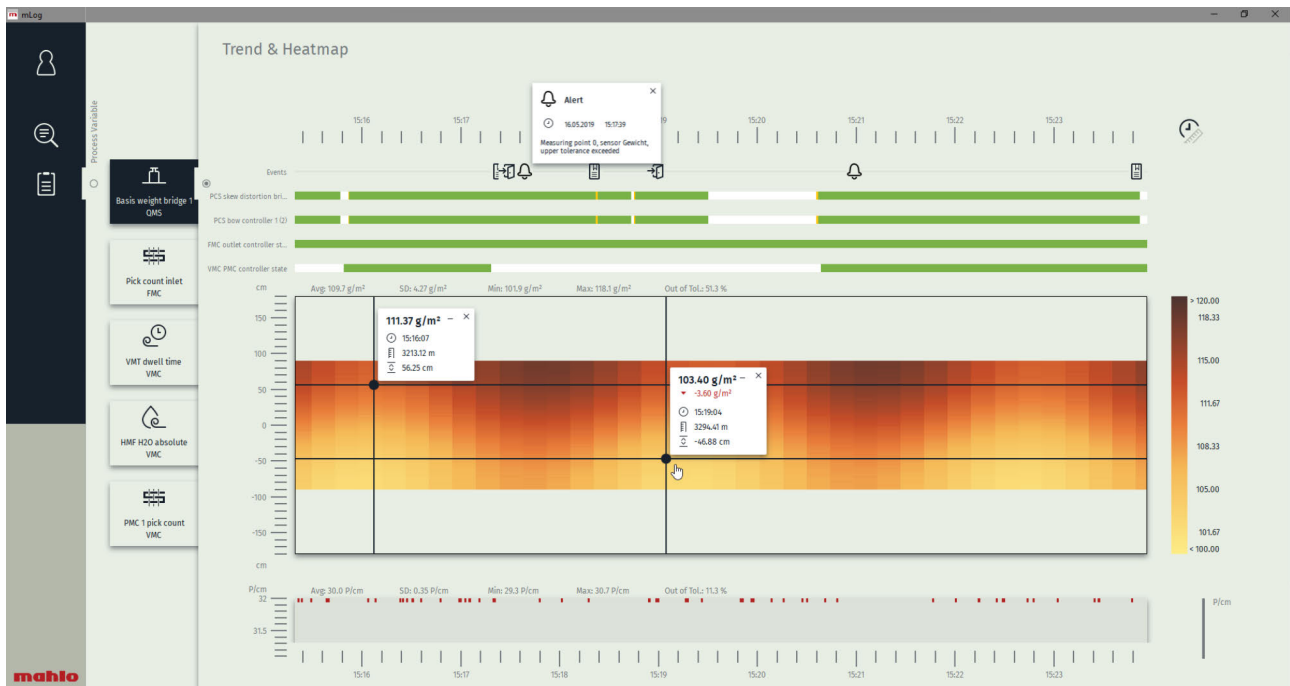
The category mLink combines all tasks around networking and data exchange. Networking a wide variety of machines, automatic communication between devices and between man and machine: These basic ideas of Industry 4.0 are consistently implemented in mLink from Mahlo .

Universal interfaces allow customer and Mahlo systems to communicate bidirectionally via standard network lines using OPC UA and many other data protocols.

The mLink category includes interface components such as Anybus Gateways.

mLog

The mLog software provides storage, logging and evaluation of measurement data across all Mahlo product families.



mLog analyses the data abundance simply and clearly

Through the mLog logging, the products (webs) are enriched with the measured information of the sensors – they become an information carrier, a 'Smart Product'. Throughout the entire production process it becomes clear when something was treated where, in what quality and with what efficiency.



The mService category combines all functions and services relating to service and support on the devices. Industry 4.0 also includes remote digital support and service. This saves resources and solves problems faster.

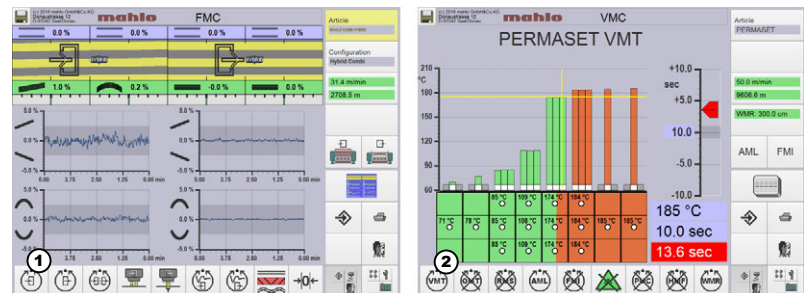


mService enables effortless remote troubleshooting

mService from Mahlo cleverly implements these possibilities. Direct and remote access is possible through mLink. Diagnostics and maintenance can be performed online via the mService system. Backup and recovery of data is easy. The data analysis of the mLog protocol can also be used to draw conclusions about errors in the production system. Individual maintenance tables enable predictive maintenance.



The mCockpit category centralises all functions for data visualisation, device operation and serves as a human-machine interface. All other mSmart modules can be addressed and configured with it. On the Mahlo device itself, all entries are made directly on the touchscreen via large, ergonomic touch buttons. Operation is simple and intuitive. All key information is visible at a glance.

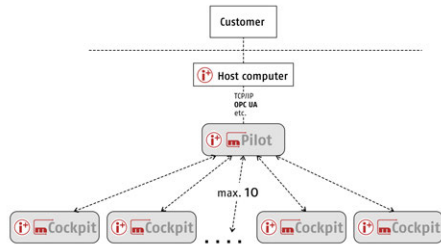


mCockpit applications control Mahlo devices

- 1 Orthopac RVMC
- 2 Optipac VMC

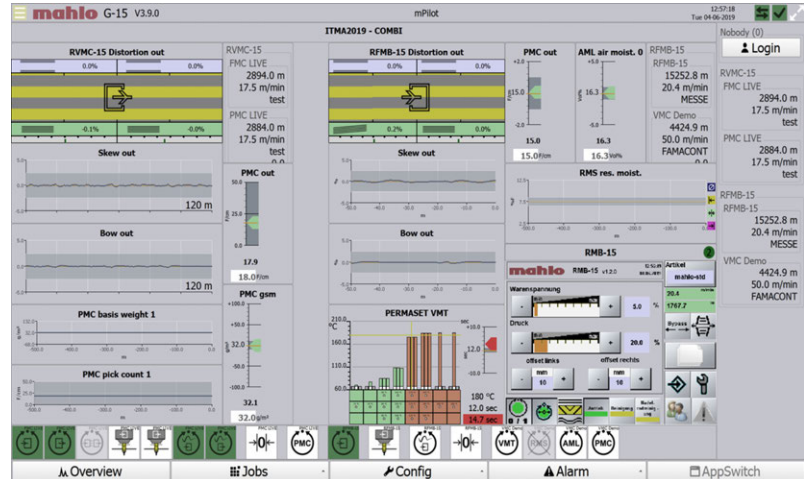
All user interfaces of Mahlo devices fall into this category

mPilot



mPilot monitors up to 10 mCockpit applications

mPilot is a control station application for Mahlo devices. The software allows the user to configure up to ten Mahlo devices with one control centre. The innovative control tool supports production and shift managers in doing their daily business as efficiently as possible.



mPilot clearly displays individually selected data from several devices

mPilot consists of a hardware component and a software package. The application is connected to the mCockpit of the Mahlo devices and via mLink interface to the user's intranet.

mCare



mCare makes communication transparent and comprehensible

In the category mCare all possibilities and tools for communication between Mahlo and the customer are summarized and optimised step by step. This will enable a simple, comprehensible and transparent dialogue in the future. In this way, customers can utilise the decades of experience of Mahlo's experts in consulting to 100%.



LISTENING

Our sales team knows how to listen: Gathering the individual requirements, preferences and ideas from our customers, they give the right direction to our product developers. This makes sure you get exactly what you really need.

Monitoring and control systems, automation

MAHLO GUARANTEES QUALITY. WORLDWIDE, IN YOUR VICINITY.

Best-possible technical support and know-how transfer are written in capital letters at Mahlo. Thanks to an international network of agencies and service centres, customers have at their disposal competent support worldwide. We are there for you 365 days a year, 24 hours a day. Just get in touch with us!

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- ✓ Service partners in over 100 countries
- ✓ Direct service and spare parts delivery within 24 hours
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mSmart - Digitalisation with Mahlo, 1, en_GB

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