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V9 system brochure  
Process Control Systems. MES inside.

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# ProLeiT through the years

## Developing innovative process control systems

When the engineering company “PROLEIT - Gesellschaft für technologieorientierte Prozeßleit- und Steuerungssoftware” was founded in 1986, the main focus of its attention had already been clearly defined: the production process of our customers – their technology and, therefore, their success!

Just three years after the company’s inception, we presented PROLEIT OS 155 – our first in-house developed, PLC-based process control system. Our first chemical industry customer was Henkel in Duesseldorf, Germany, which used our process control system for automating its drying towers.

The system version PROLEIT OS 386 allowed us to realise a process control system that could be operated using conventional PCs. And in 1994, we were commissioned to automate the new entire Müller Milch plant in Leppersdorf, Germany, using PROLEIT OS-NT 1.0.

We used version PROLEIT OS-NT 4.1 back in 1998 to support S7 controllers from Siemens for the first time, and one year later we presented our innovative class concept with version OS-NT 5.0.

New brand names were developed for the PROLEIT systems at the start of the new millennium: Plant iT and brewmaxx, with brewmaxx being the Plant iT industry solution for breweries. In 2002, we automated the then most modern brewery in Europe for Grolsch in the Netherlands according to the ISA- 88 standard.

Two years later in 2004, we showcased numerous innovations with Plant iT V7. One of them is the unique add-on Visu-Recorder.

Plant iT V8 in 2008 signalled a leap in technology: a central process control system that can run on controllers from Siemens and Rockwell Automation. And with the module Plant iT material we realised a process-oriented materials management system that can be combined with all the base systems.

Further large-scale projects followed: for example complete automation of a baby food plant for Almarai in Saudi Arabia, migration to brewmaxx at the Warsteiner brewery in Germany and automation of the entire process for the Carlsberg brewery in Fredericia, Denmark.

Since the launch of V9 in 2013, our control systems are seen as the most state-of-the-art versions available thanks to new navigation concepts and an integrated process graphics designer.

The upgrade 9.50, which was unveiled in 2017, offers, among other things, new operating dialogues developed on the basis of extensive usability tests. ProLeiT therefore guarantees not only greater operating flexibility but also even more efficient plant management support. Adhering to our vision of constantly expanding the ProLeiT system platform, further technical innovations such as the modules Plant iT web portal and Plant iT archive manager as well as the new add-ons Plant Batch iT MWS, Plant Integrate iT Batch Cockpit and Plant Acquis iT LMS were added in 2017.

In 2019, the upgrade 9.70 expanded the product portfolio to include a maintenance management solution that offers comprehensive analysis options and supports predictive maintenance.



Historical system development



**“Our process control systems are currently used in more than 100 countries”**

In 2019, we reached a magical mark: our process control systems are currently used in over 1,800 plants, in more than 100 countries. This is why we are a leading provider within our core industries. Our job, to ensure it stays that way, will be to continue ex-

panding our international presence. We are currently represented in the following countries:

- **America:** Brazil, Mexico and USA
- **Asia and the Middle East:** China
- **Europe:** Bulgaria, Germany, The Netherlands, Russia, Spain and the Ukraine.



## Certified by experience

### Vision and motivation



Our automation solutions offer our customers certain **peace of mind**: in terms of the financial investment in their systems and their availability, their production processes and the actual **quality** of their products.

To meet this high demand, we specialise in meeting our customers' requirements by focussing on core industries and establishing competence centres, consisting of highly skilled technical and experienced technology engineers.

We see ourselves as a learning organisation that exploits **knowledge** and innovation in open and effective cooperation with our customers.

We have been embedding this knowledge into our modular process control systems Plant iT and brewmaxx for more than 30 years. By focussing on a small number of core industries and continuously transferring knowledge to customers, partners and universities, we have been able to equip our process control systems with the appropriate scope and depth of unique functions and integration. Therefore,

ProLeiT solutions are the **automation standard** in a number of internationally renowned corporate groups in the food and beverage industry.

However, for the majority of our customers we are more than just a provider of industry-based process control technology: we are an adviser, developer, technology expert, MES consultant, commissioner, trainer and supporter.

We take responsibility for our actions, since our services and products influence our customers' success. We therefore adapt our daily activities to take the requirements of our customers into account, creating the basis for **successful** cooperation and trust.



*L.t.r.: Wolfgang Ebster (CEO | CFO),  
Josef Buchsteiner (COO | R&D),  
Manfred Czepl (COO | Sales) and  
Jürgen Wölfl (COO | Projects)*

Our products and solutions allow our end customers to control, monitor and optimise their increasingly complex production processes. Our OEM customers are provided with the tools that enable them to offer systems with tailored automation concepts. Our system integrators use our products to develop reliable customer solutions with the highest level of productivity.

We contribute to the success of all our customers. Our utmost priority is to achieve strong results which always meet our customers' expectations. Therefore we have formulated the following objectives:

### Absolute customer satisfaction

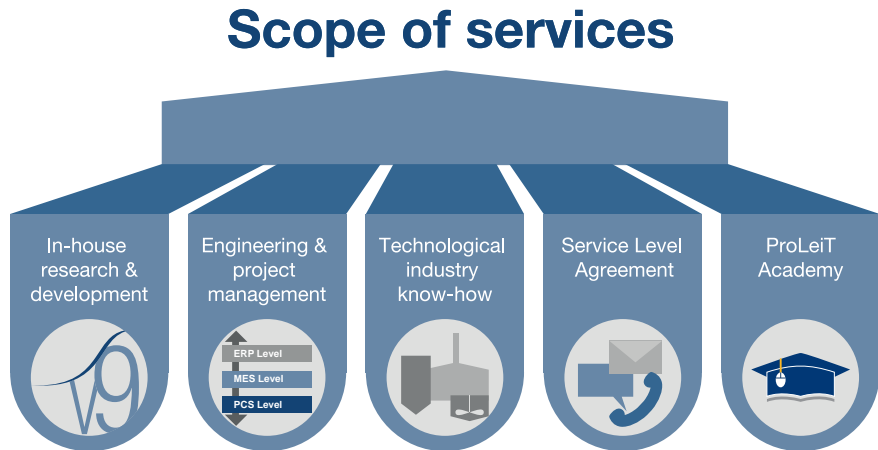
Excellent and professional service must generate loyal regular customers. This is achieved through personal dedication, commitment and motivation, as well as successful projects.

### Maximum independence

As an independent company we work together with all well-known plant and machine builders of our core industries. Our solutions ensure that customers remain independent when selecting their preferred equipment manufacturers. The Plant iT and brewmaxx process control systems offer customers the freedom to choose their preferred vendor (e. g. Siemens, Rockwell Automation). The performance of Plant iT or brewmaxx is still achieved even if a decision is taken to change the provider at a later date.

### Maximum customer benefit

As a mid-sized company we offer our customers a remarkable service portfolio full of technical expertise and practical engineering skills, years of experience in turnkey automation projects and the in-house control system range Plant iT and brewmaxx. This mixture in combina-



*The five core competencies of ProLeiT*

tion with the flexibility and short decision paths is one of the biggest advantages for our customers.

### Maximum local presence

Customers can rely on our service and our strong local presence. Our international locations and our worldwide partner network ensure we are close to our customers and along with our technical skills, quality of service and reliability, we contribute greatly to building the required trust for long-term cooperation with our customers.

### Extensive training offers

To guarantee our customers are perfectly trained to work with our control systems and thus well prepared for the full range of responsibilities they will have to undertake, they can participate in courses at our in-house training centre, the ProLeiT Academy. Our certified coaches have extensive experience working with our solutions and offer a vast range of training courses in various areas of application.

### Integrated solution skills

Customers can rely on our tailor-made industrial solutions for all their production processes. Our solutions and products not only cover all production requirements from the raw material stage to the finished product, but also offer full vertical integration from the control level through the process and plant control level (MES) up to the corporate management level (ERP).

### Optimum project management

On the basis of our experience and the internationally recognised IPMA standards, we implement projects systematically, professionally and reliably. The industry-based corporate structure at ProLeiT ensures our dedicated team of experts helps our customers get to grips with planning, implementing and monitoring project-specific activities.

# Industrie 4.0 (IIoT)

## Integrated solutions for smart factories of tomorrow

Rapid development, including an ever faster and more networked world of production, offers not only new opportunities but also creates new challenges. Within this context, a keyword that can often be heard is “Industrie 4.0” or Industrial Internet of Things (IIoT) – but terms alone do not generate added value. For ProLeiT, however, Industrie 4.0 (IIoT) has not simply become a trend topic but is seen as a decisive step towards the future of the process industry.

Industrial Internet of Things (IIoT) is usually only associated with conventional machine and plant engineering applications; in other words, production-related activities. That said, the smart factory provides many benefits for the process industry, including digital integration of all industrial facilities and processes. Furthermore, implementation is quite straightforward when using a Manufacturing Execution System (MES) as the central analysis and reporting unit.

### **The smart factory**

Transforming a traditional factory into a “Industrie 4.0” smart factory results in significant changes to the way it operates. Business processes respond dynamically to changes in the market, while production techniques adapt automatically to ensure an appropriate balance between cost, quality and environmental impact. Production technology will adapt to specific customer needs, identify and eliminate bottlenecks and control plant throughput automatically.

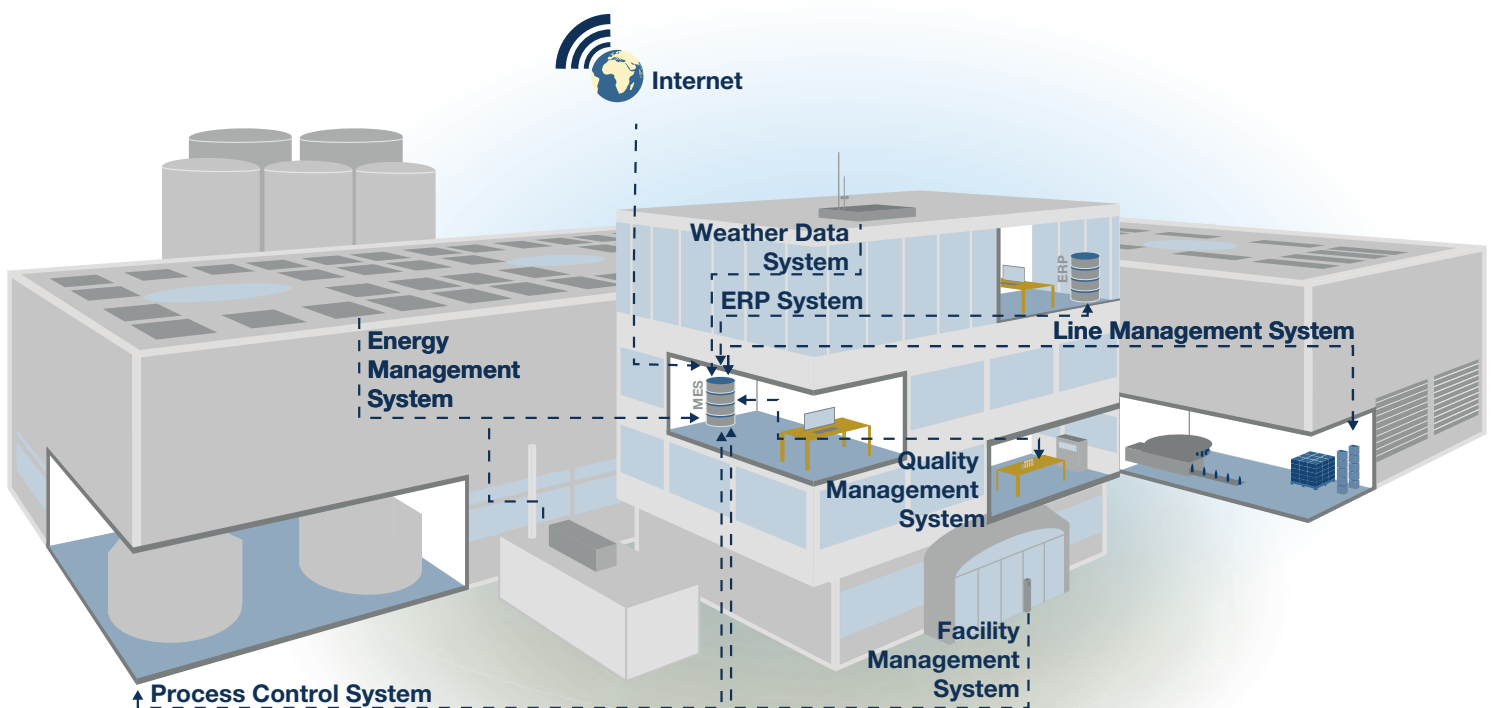
This goal - true to the vision of Industry 4.0 - is achieved by vertically coupling technical and commercial business processes and horizontally linking processes and systems along the value-added chain. Viewed from a production standpoint, it is not just the company departments that are interconnected - from initial order to outbound logistics - but additionally also the company's systems to those of its suppliers and buyers. Processes can therefore be controlled and

improved across the entire plant. Production becomes completely transparent from start to finish, providing the ideal platform for sound commercial and technical decisions. The smart factory additionally enables companies to identify and satisfy individual customer needs, as even the smallest batch size can be produced economically.

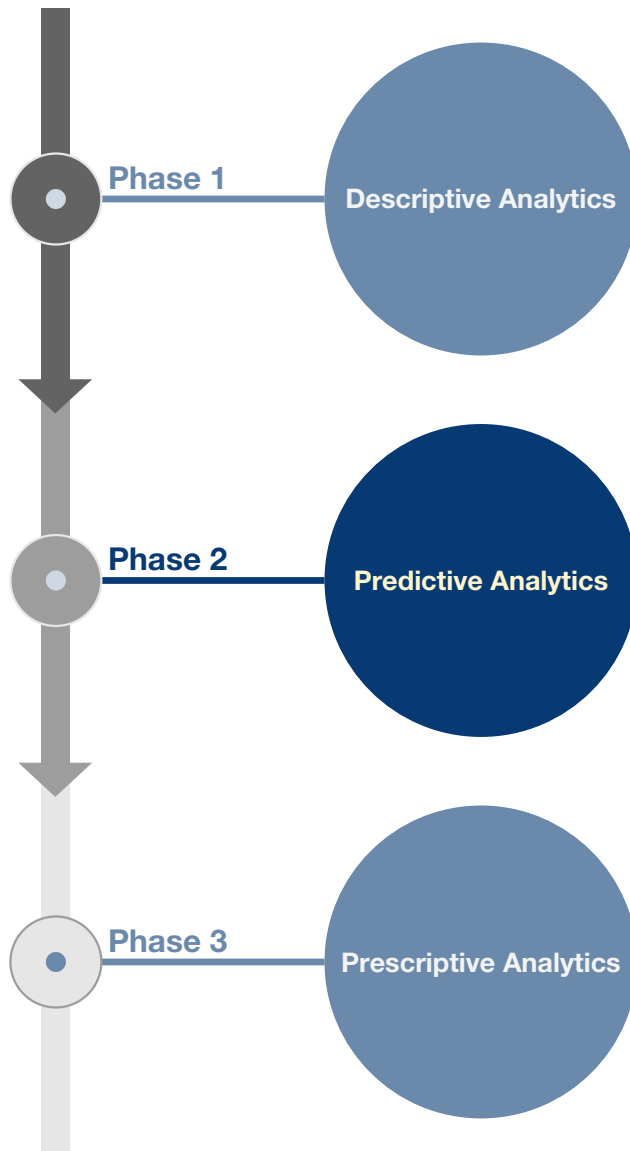
### Integration of heterogeneous systems via MES

This vision can be brought to life with a correspondingly adapted Manufacturing Execution System (MES). The MES solution from ProLeiT is called Plant Integrate iT, which can be used independently of the process control system Plant iT. The MES integrates

the heterogeneous information of the individual production plants and combines the production level with the commercial business processes. Needless to say, companies profit directly from a plant-wide and common database. The more systems that automatically exchange information, the greater the added value for the operator. The many benefits include dynamic order management and the opportunity to develop and improve plant-wide recipes, as well as being able to trace production data. By displaying the interrelations between production data, the MES is the ideal solution for all supervisors.



Networked systems in the smart factory



*The method of predictive analysis already applied by ProLeiT helps plant operators to predict the probability of future events more reliably, instead of just analyzing an existing situation. However, our goal for the future is to provide prescriptive analysis that deals with the question of what is needed to ensure a future event occurs / does not occur. It uses automatically captured and continuously processed data to generate recommendations for action. Plant operators are therefore given the opportunity to gain an advantage from future situations, to minimise potential risks and to anticipate the consequences of the respective options.*

## Big data analysis via dashboards

Freely configurable dashboards ensure a clear overview of all the collected production data. Recorded and archived data can be filtered according to various criteria, including time period, order, customer, product, batch, location and energy consumption, as well as interlinked and presented in real time. In many cases, interrelations become apparent that would otherwise be invisible, as the data is either unavailable or stored at various locations and systems in different departments. Supervisors can therefore respond faster to any deviations, sometimes even in real time.

























## Industrie 4.0 (IIoT) in the real world

Integrating an MES is a crucial step towards changing a traditional factory into an intelligent one. While media articles on Industrie 4.0 (IIoT) portray the characteristics of the smart factory as a vision of tomorrow's manufacturing, operators of an integrated factory can, thanks to ProLeiT, already profit from its many advantages today.

This applies, in particular, to companies whose production plants have been operating for decades and have a heterogeneous IT structure. The integrated systems and improved data analysis guarantee operators a unique competitive edge.

# Industrie 4.0

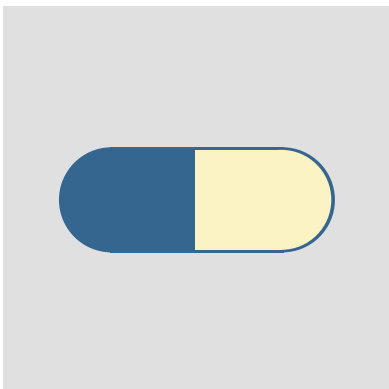


Application Level	Stages of Development			
<b>Data processing in production</b>	 No data processing	 Data for process monitoring	 Data for process control	 Data for automated process planning/control
<b>Machine to machine communication (M2M)</b>	 No communication	 Fieldbus/Ethernet	 Internet access	 Web services/ M2M-Software
<b>Company-wide networking</b>	 No networking	 Unique data formats	 Inter-divisional networked data server	 Complete networked IT solutions
<b>Infrastructure in production</b>	 Mail and telecommunication	 Central data server	 Internet based portals with data sharing	 Integration of customers
<b>Human Machine Interfaces (HMI)</b>	 No information exchange	 Local display devices	 Production monitoring/ mobile display devices	 Augmented and assisted reality
<b>Efficiency in handling small batches</b>	 Rigid production means	 Flexible production means and common parts	 Flexible production, modulare products	 Common parts driving modular production in added-value networks

Industry 4.0 at ProLeiT

Source: VDMA Guidelines Industrie 4.0

Practical realisation of Industrie 4.0 (IIoT) – development steps at ProLeiT



## Industry expertise

### Industry solutions for the process industry

We have been supplying the process industry with integrated automation solutions for more than 30 years. We are familiar with all the technologies and specific requirements of the various sectors. This is our guiding vision – in both our industry-driven corporate structure and the industry-specific functions of our very own process control systems Plant iT and brewmaxx.

From operational data acquisition, process control with extensive recipe management and S88 compatible batching systems to functions for complete, location-independent production management (MES) and integration of ERP, LIMS and maintenance systems – all these processes can be continuously controlled and monitored using Plant iT and brewmaxx. Our system comes pre-packaged with extensive functionality for use primarily in the following industries:

#### **Beverage industry**

Plant iT offers industry-specific functions for the beverage industry, e.g. recipe-controlled program sequences for liquid handling, automation of sugar and dissolving plants for the production of fruit juices, soft drinks and energy drinks, control of blending plants for the production of fruit juices, waterhouse automation for springs, etc.

#### **Brewing industry**

Plant iT for the brewing and spirits industry is marketed worldwide under the brewmaxx brand. Thanks to many years of intensive cooperation with universities as well as plant and machine manufacturers from the brewing and malting industry, a highly specialised control system has been developed which offers innovative automation solutions for silo systems and malt handling, brewhouses, fermenting and storage cellars, yeast management, filtering systems, filling systems, utilities and CIP plants.

#### **Food industry**

Plant iT is used around the world by food industry manufacturers to produce numerous products, e.g. meat, cold cuts and sausages, bakery products, oils, fats, confectionary, basic food substances, as well as feed and mixed feed. A key solution component from Plant iT is the ability of the solution to help meet IFS certification.

### Baking industry

Plant iT provides specially integrated functions for the baking industry, including order management, recipe management, process-related materials management, integrated energy management, quality and production optimization, as well as maintenance and repairs.

### Dairy industry

Plant iT is an advanced, industry-specific system solution which combines extensive IT experience and dairy expertise in a single control system. It is used for production and filling of untreated and treated milk, UHT milk, cream, butter cheese, yoghurts, fromage frais, desserts, milk powder and lactose.

### Pharmaceutical and biopharmaceutical industry

The Plant iT portfolio for the pharmaceutical industry includes a batch system according to ISA-88 for batch and continuous processes, integrated materials management with batch tracing as well as electronic batch recording. Our GMP-compliant solutions satisfy international regulations, e.g. FDA 21 CFR Part 11 Electronic Records and Electronic Signatures.

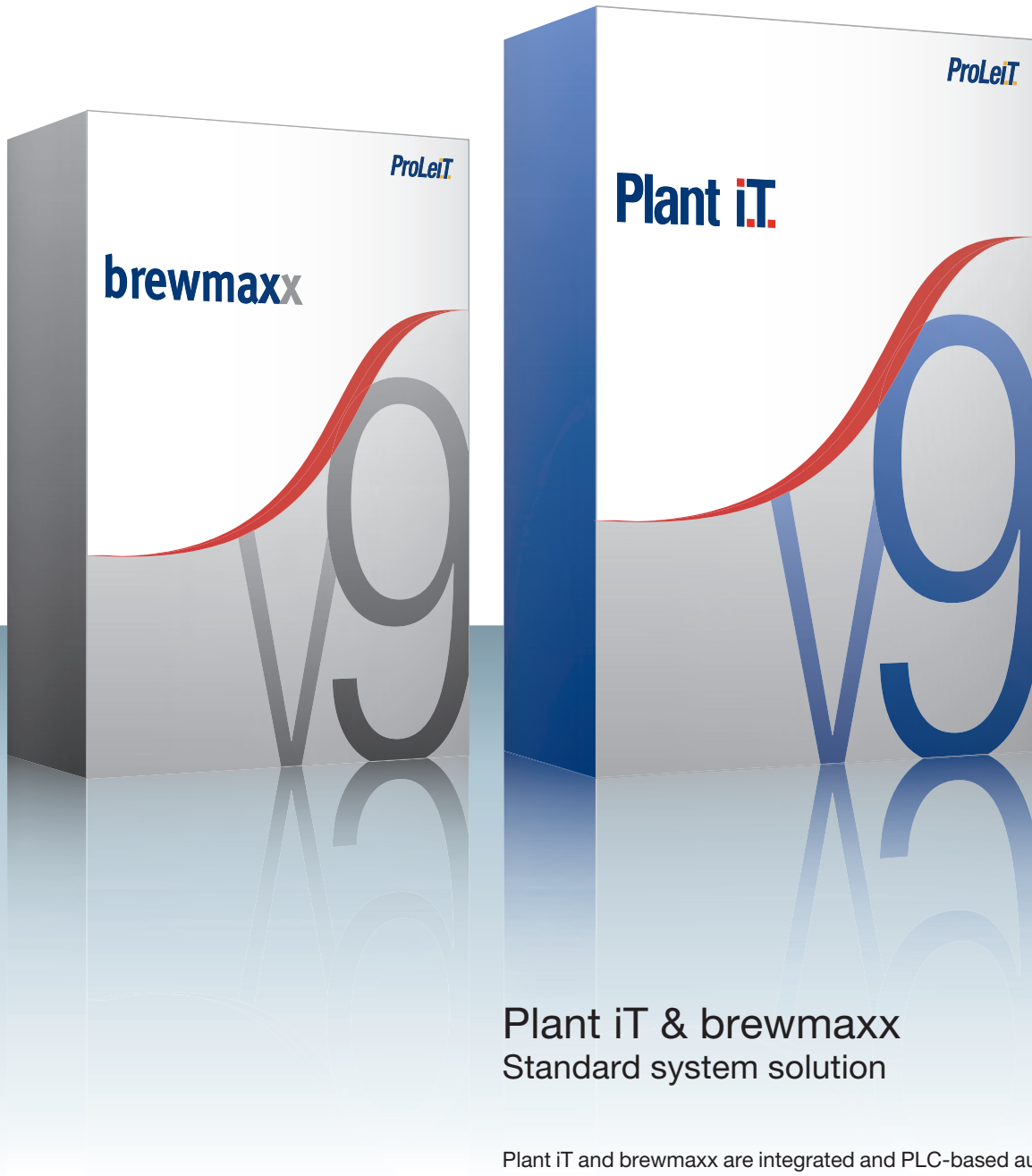
### Chemicals industry

Plant iT is also used within chemical production processes, i.e. for the production of washing products, wax ester, cleaning agents, adhesives, fuels from renewable primary products, synthetics and synthetic products, as well as paints and coatings.

### Varnishes and paints

From production, mixing and dosing to filling, the modular process control system Plant iT offers an ideal and reliable overall solution, even in the industrial sector of paints and varnishes. Numerous functions tailored to the industry-specific requirements, including, for instance, an assistant for manual weighing processes, support efficient and convenient plant management.





## Plant iT & brewmaxx Standard system solution

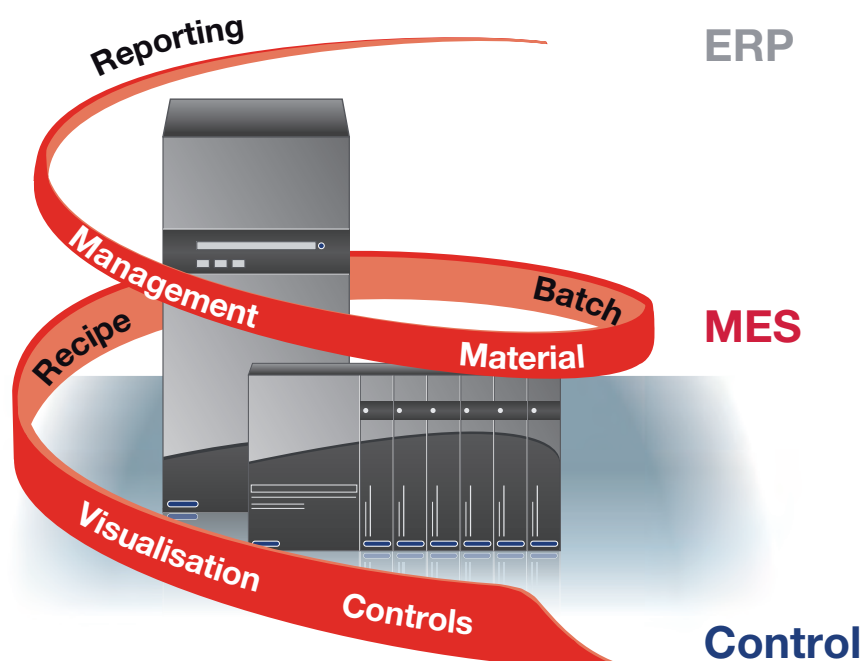
Plant iT and brewmaxx are integrated and PLC-based automation solutions whose base systems include:

- An object oriented process control system with
- integrated recipe management system for
- continuous and/or batch processes with
- integrated MES functionality,
- in a single database,
- on a single server,
- with a single, standardised user interface.

## All from one source

Using only our industry leading products, we provide complete automation solutions for the process industry. The whole sphere of automation and information technology from the field right up to the company management level is covered by our extensive industry expertise. We provide turnkey automation solutions beginning with concept development and compilation of the specification through to software generation and commissioning. The range of our services includes:

- Compilation of user requirements and system specifications
- Conception, engineering, delivery and commissioning of
  - Hardware for control technology, including networks
  - Process control systems Plant iT and brewmaxx
  - Solutions for production, data acquisition and energy management
- MES solutions for order management, material management and management reporting as well as batch and product tracking
- Horizontal integration of all process layers and vertical integration of all system levels right up to connection of laboratory and ERP systems (e. g. SAP)
- Qualification of process control technology for plants with regulatory requirements



## Established standardisation

We develop and market technology-oriented process control systems under the brand names Plant iT and brewmaxx. Plant iT and brewmaxx provide a system family that covers control requirements from the control level up to the manufacturing execution level.

Plant iT and brewmaxx enables us to offer efficient engineering to standardised methods. We are proud of the fact that almost all the technical and technological functions can be implemented by parameterisation rather than customised programming.

## Parameterisation instead of programming

Due to the unique Plant iT and brewmaxx class concept, software module classes with fully configurable parameters always controls and monitors all similar objects in the plant. Compared to conventional process control systems, Plant iT and brewmaxx offers numerous positive effects, like:

- Shorter commissioning times due to proven software quality
- More efficient procedures for extending, adapting or gradually realising production plants
- Engineering according to standardised methods (“parameterisation instead of programming”)
- Enhanced investment protection (PLC manufacturer independent solution)
- Easy-to-use (central GUI for PCS, MES, batch system, etc.)

# New features of version 9

## Usability and design in a perfect harmony

### User Interface

The new Operation Manager is the central user interface for operators and is available not only for the base systems but also for all add-ons and modules. The revamped user interface complies with the latest usability standards and facilitates operation, monitoring and control of production processes.

The presentation of process areas and MES functions, editable menus and numerous new processing functions enables intuitive and effective utilisation of the control system. All elements of the new interactive main menu bar and from the slide-out side menu can be added to the new dashboard via drag & drop.

The new function for displaying process pictures on several monitors is particularly convenient. Process pictures can now be moved from the Operation Man-

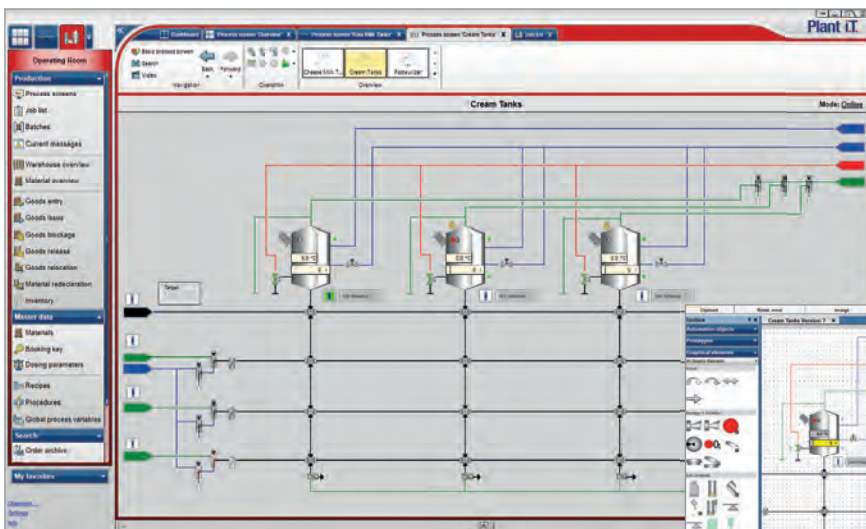
ager to other monitors. This ensures simpler operation on the latest touch panels with multi-finger operation.

### Process Image Designer

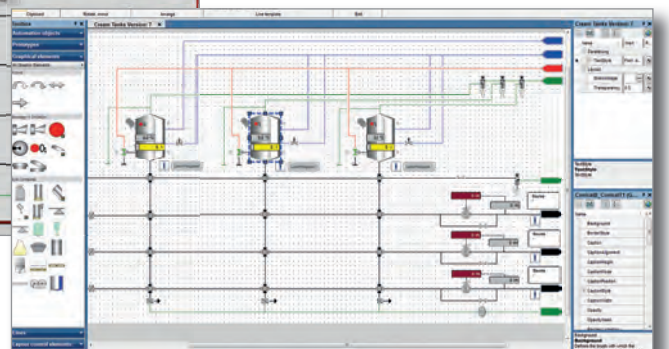
It has never been easier to create complex process images using Plant iT&brewmaxx. The new Process Screen Designer is an integral part of the process control systems and offers extensive libraries of industry-specific graphic objects which can simply be added via drag & drop.

So called "Prototypes" already have pre-settings (e.g. graphic object, unit) and only have to be linked to one automation object after being added to the process picture. Automation objects on the other hand already boast all the required settings, e.g. PLC source link. The new vector-based graphical elements are fully scalable and provide optimum display quality for high resolution displays.

With Plant Integrate iT and brewmaxx Integrate we have developed new stand-alone MES solutions to run with or without our process control systems. Production reports can be easily displayed and transferred via a web browser.



Process picture of a dairy plant within the Operation Manager



Creation of process pictures with the integrated Process Screen Designer

Based on standard software components (e.g. SSRS from Microsoft) we are able to centrally process and edit information from various sources, whilst ensuring it is displayed in a leading-edge manner on multiple devices.

### Operating Dialogues

The new operating dialogues of the Operation Manager have been specially developed for use on touch interfaces. This particularly facilitates the operation of automation objects via mobile end devices, such as controlling valves.

### Process Screen Viewer

The new Process Screen Viewer application enables the display of process images outside the Operation Manager with an individually adaptable arrangement of the individual process images.

### Curve Viewer

The new curve viewer of the Operation Manager optimizes the display of measurement curves while providing additional functions for research, commenting and comparing measured values. This means, for example, that order and batch comparisons from differing time periods can be quickly analyzed and displayed.

### Web Portal

The Plant iT web portal/brewmaxx web portal ensures the process control systems Plant iT and brewmaxx have a host for web applications with standardized user management, language switching and user interface design. This enables the presentation of all types of reports, messages and measured values via web browser. In addition, the web portal con-

tains a software development kit (SDK), which allows the integration of your own websites and third-party components.

### High Attention Library

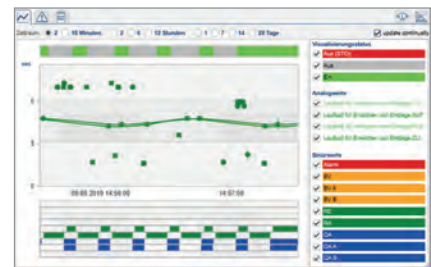
The new high attention library has been specially developed to graphically highlight messages and faults. The colour contrasts are more visible by discreetly displaying normal states (e.g. white, grey) and indicating alarm states in a bright colour (e.g. red). Faults and warnings can thus be perceived more quickly in complex process images.

### Line Management System

With Plant Acquis iT LMS / brewmaxx LMS, a new add-on is available for the basic systems Plant Aquis iT and brewmaxx, which is used, for example, to acquire and analyze fault data. It additionally provides an electronic shift and order log along with a dashboard for viewing current OEE key figures and other KPIs.

### Archive Management System

The new Plant iT archive manager / brewmaxx archive manager module enables the archiving of all transaction data of the control system and its presentation for several years. Access to the archive manager is simple using standard Plant iT / brewmaxx clients.



Operating dialogues in the Operation Manager



Dashboard of the Operation Manager



High Attention Library

# New in Version 9

## Stand-alone MES & Batch Cockpit

### Stand-alone MES Solution

Plant Integrate iT and brewmaxx Integrate are new, stand-alone MES basic systems that can be used together with or without our process control systems. Based on standard software components (e. g. SSRS from Microsoft), information from various sources is centrally processed, prepared and displayed on a wide variety of end devices via the web.

### Batch Cockpit

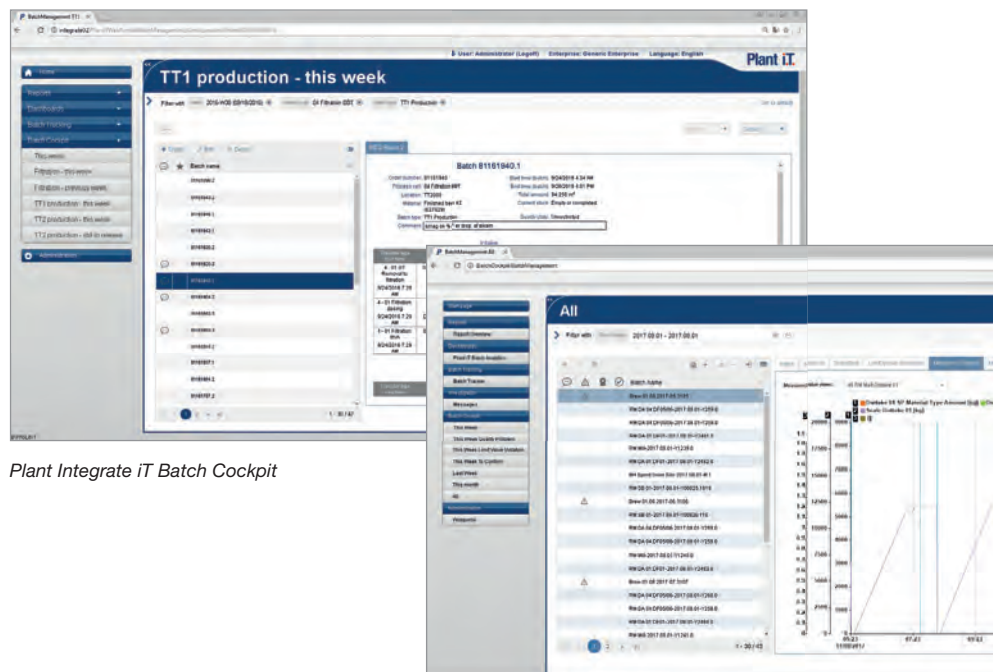
As an option to the new MES solution, Plant Integrate iT Batch Cockpit / brewmaxx Batch Cockpit is a useful add-on for post-processing manually entered production data. The add-on enables the subsequent input of non-automated processes, offers freely definable filters for targeted analyzes of production data and has an audit trail function for viewing the batch record.

### New Automation Classes

New automation classes have been developed especially for SIMATIC controllers, type S7-1511 to S7-1518. These newly created classes are particularly suitable for connecting micro plants and package units (e. g. pasteurisation unit, CIP) and provide a further key component for modular automation (MTP).

### OPC Unified Architecture Server

OPC UA is the manufacturer-independent communication protocol for automation applications in the process industry. Process and production data can thus be exchanged even faster and more securely with partner systems such as SCADA, ERP or quality management systems, and the continuous communication from individual sensors and actuators to the ERP level is



Plant Integrate iT Batch Cockpit

brewmaxx Integrate Batch Cockpit

## OPC UA Server, Maintenance Management & MWS

optimized. With OPC UA, the connection of package units or intelligent peripheral modules is fast and simple. Built-in security mechanisms ensure maximum IT security when transferring data points. Secure and ideally prepared for the implementation of Industry 4.0 applications.

### Maintenance Management Solution

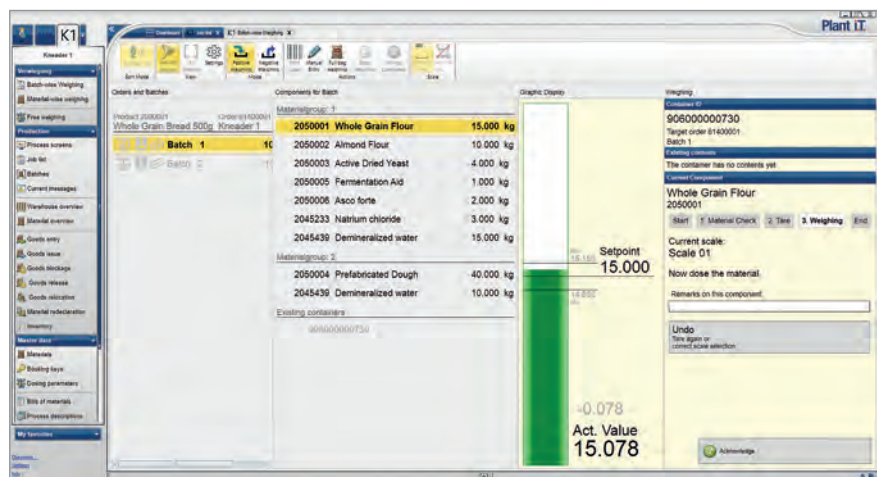
Plant Direct iT Maintenance / brewmax Maintenance is a parameterisable solution for evaluating and planning maintenance tasks. With this add-on, individual automation objects, such as valves, motors and frequency inverters, and entire package units can be managed in a clear and concise manner. Essential functions are the automatic evaluation of system

classes, the individual parameterization of maintenance, the graphical evaluation of the switching cycle and – in terms of predictive maintenance – the display of the expected next maintenance date.

### Intelligent Weighing Assistant

The add-on Plant Batch iT MWS (manual weighing system) is an assistant system for guided, manual weighing processes. It offers reliable visual monitoring of manual weighing processes, automatic selection of suitable scales, label printing (including job data), weighed components and, if necessary, hazard symbols. The operating staff is reliably guided through the weighing process by means of five different colour gradations and can thus, for example, process part lists in a clear and concise manner. In order

to offer the best possible support for processes at the operating station, the application contains workflow data, including, e.g., information about required protective clothing or how to handle certain materials.



Weighing masks in Plant Batch iT MWS

# System advantages

## Technical and technological innovations

There are many good reasons for using a Plant iT or brewmaxx PCS. A few of them are listed below:



### Compiler-less system architecture

Plant iT & brewmaxx enable process changes without having to stop production.

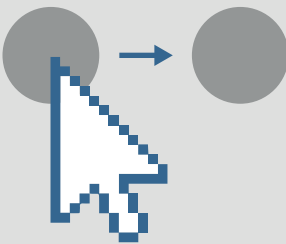
Cost and time savings; minimal risk in case of migration or system extensions, operational flexibility



### Standard operating system and database software

Plant iT and brewmaxx are exclusively based on Microsoft operating systems (Windows) and databases (SQL).

Flexibility and transparency; investment protection; detailed visualization of the application for the user; very high level of user acceptance



### Process image design via drag & drop

Graphic objects (vessels, valves, pipes) and process pictures can be created very easily using the Process Graphics Designer. A library of industry-specific process graphics are available, which can be inserted via drag & drop and linked automatically to the field devices.

Time and cost savings; Engineering independent system; the integrated application enables, amongst other things, the creation and version management of individual graphic objects and templates

### Multilingual process control system

The system is available in the following languages:  
English, Spanish, German, Russian, French, Portuguese and Chinese.  
Also full Unicode support is provided.



Independent system, investment protection, transparency; usually simple integration into the existing IT infrastructure



### Integrated process recording and replay

Thanks to the add-on Visu-Recorder, Plant iT & brewmaxx are the only systems that offer an application which records all historical process data and allows it to be replayed through the operators terminal.

Transparency and knowledge transfer; perfect application for continuous improvements and staff training

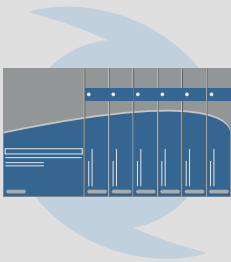


### Central user interface

The new user interface has been developed to the latest standards and with the help of usability experts.

Time savings; new operators become familiarized with procedures in a minimum amount of time, high level of user acceptance; simplifies change management

## Siemens



## Rockwell Automation

### PLC-based process control system

Plant iT & brewmaxx have been developed for programmable logic controls from Siemens and Rockwell Automation.

PLC manufacturer independent; maximum flexibility, Standardized solution, globally deployable

# MES inside



### Integrated MES functionalities

Plant iT & brewmaxx contain integrated MES and energy management functionalities. Information can be visualized and evaluated more effectively using easy-to-create and flexible analysis dashboards. A browser-based web portal enables reports to be opened online, irrespective of where the user may be physically.

Cost and time savings; central system solution with standard interfaces to external systems (e. g. LIMS, ERP).

### Object-oriented process control system with automation classes

The need to individually create PLC code is dramatically reduced. The standard Plant iT & brewmaxx version already includes numerous pre-configured automation classes.

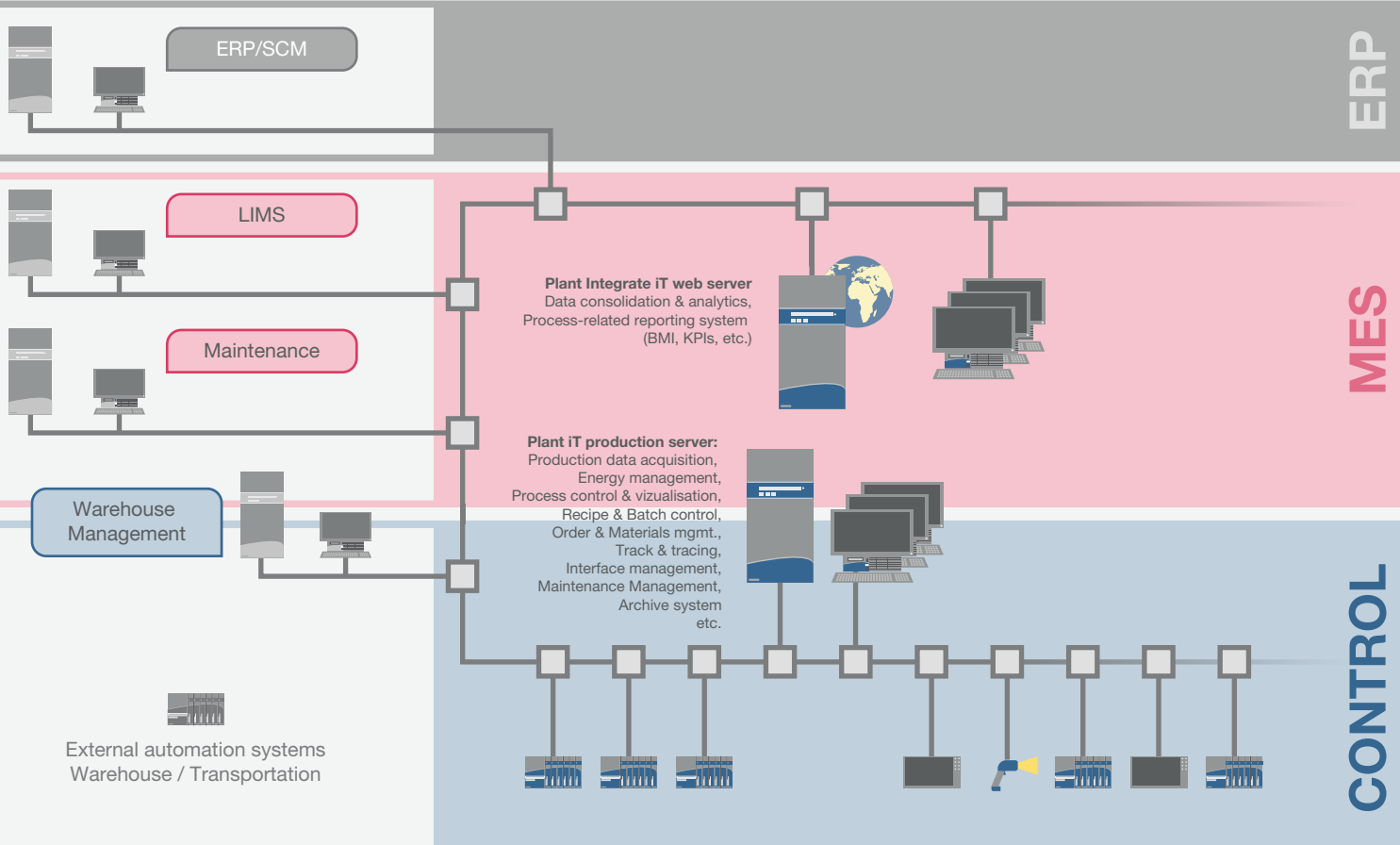
Transparency and knowledge transfer; the module library supports quick commissioning and simple configuration

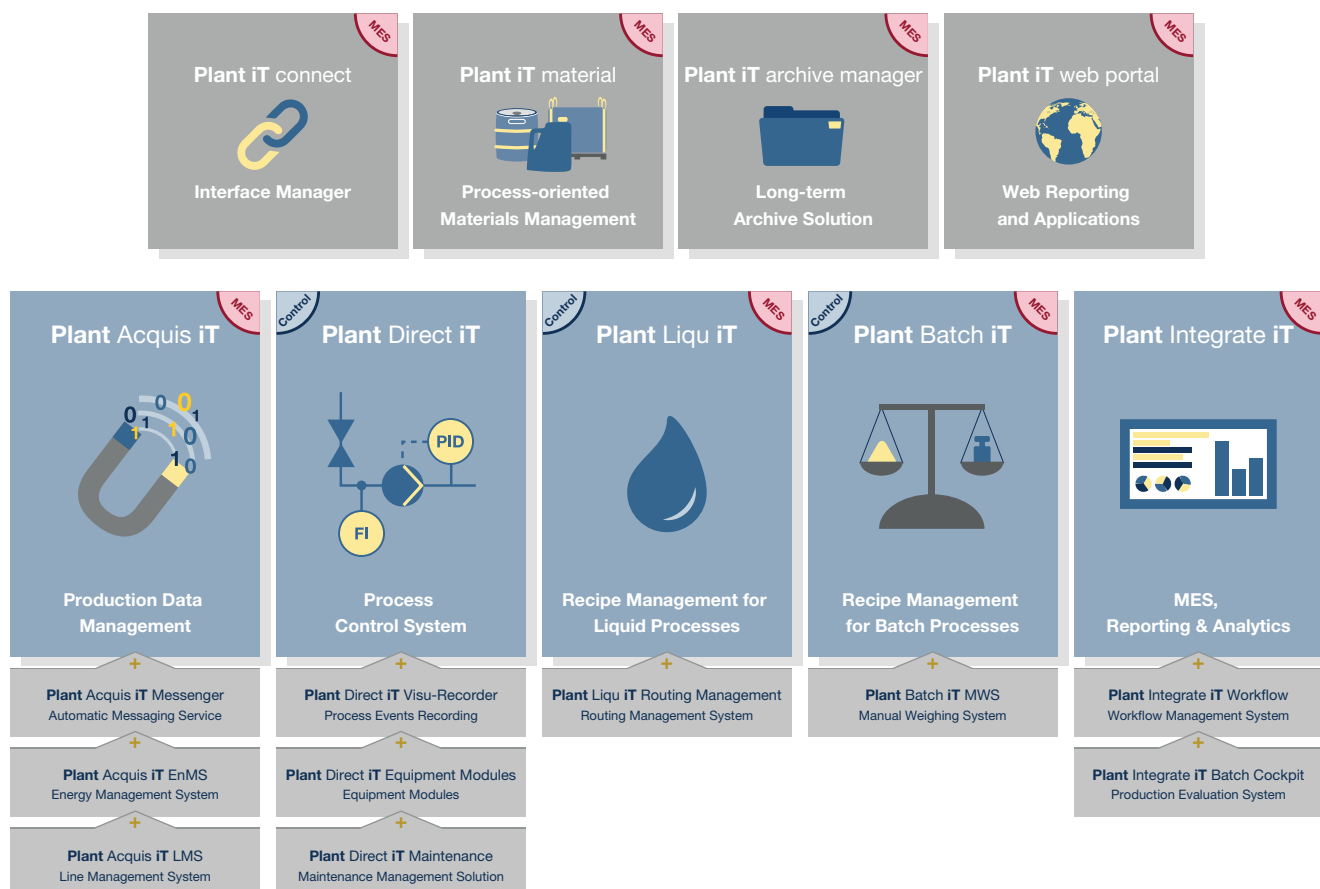
# Plant iT.

## System requirements



## System overview





Plant iT is an integrated and modular software platform, consisting of base systems, modules and add-ons which can be combined flexibly. The core systems as well as the modules and add-ons, are seamlessly integrated, with a central user interface across the system.

The following base systems are currently available:

- Plant Acquis iT – Production data management
- Plant Direct iT – Process control system
- Plant Liqu iT – Recipe management for liquid processes
- Plant Batch iT – Recipe management for batch processes
- Plant Integrate iT – MES, Reporting & Analytics

If required, the Plant iT modules can be combined with the base systems. This is possible at the start of engineering or at a later date. The individual modules have been developed for typical fields of application and complement the respective base systems with additional technological functions.

The following modules are currently available:

- Plant iT material – Process-oriented Materials Management
- Plant iT connect – Interface Manager
- Plant iT webportal – Web Reporting and Applications
- Plant iT archive manager – Long-term Archive Solution

The following add-ons are tightly integrated with the base systems:

- Plant Acquis iT Messenger
- Plant Acquis iT EnMS
- Plant Acquis LMS
- Plant Direct iT Visu-Recorder
- Plant Direct iT Equipment Modules
- Plant Direct iT Maintenance
- Plant Liqu iT Routing Management
- Plant Batch iT MWS
- Plant Integrate iT Workflow
- Plant Integrate iT Batch Cockpit

# Base system



quality assurance into account. The following data is basically acquired:

- Machine and process data (statuses, measured values, meters, etc.)
- Energy data
- QA-relevant data (e.g. analysis results)
- Maintenance-related information (operating cycles, operating times, etc.)
- Manual inputs (e.g. laboratory values, offline meter values, additional information)

To ensure the collected data is available throughout the company for analysis and optimization purposes, it must be provided in a consistent and standardised fashion, ideally in a process control system. This involves, however, the realisation of specified data structures and standardised interfaces to the individual control units of the machine suppliers. We employ the **Weihenstephan Standards**, which we helped to develop, to guarantee this level of data integration and standardisation.

Complex plants are often supplied as individual plant sections with self-contained control systems. These isolated applications are a particular challenge for integrated automation. Our PDA system Plant Acquis iT allows us to also acquire and provide data to sub-systems. Therefore we can offer a standard

- operating philosophy,
- data acquisition,
- data evaluation and
- data archiving.

## PDA Production Data Acquisition

An **increase in efficiency** is usually a key requirement when building new production plants or modernising existing ones. It is essential to optimise production processes, thus increasing productivity while safeguarding product quality. However, the achievement of these goals requires accurate data. **Real-time information** from the production plant must be available at all times. This is the only way to build a solid basis for all further optimization measures.

**Production data acquisition** provides the foundation for production optimization whilst taking product liability and

# Plant Acquis iT

## Production data management

Plant Acquis iT acquires, processes and records, operational, machine and energy data for the plant-wide information management. In particular it takes into consideration the heterogeneous and complex nature of subordinated automation systems from which data are acquired.

OPC is used as preferential interface. For systems not supporting OPC an additional, driver-based interface is available. It is designed in such a way that it avoids interfering with the functionality of subordinated systems. Using connection methods like this, easy and flexible interfacing with various controller platforms is possible (e.g. Siemens, Rockwell Automation or others).

### Data acquisition

Plant Acquis iT acquires and processes (both online and offline) various types of data like

- messages (binary values),
- measured values (analogue values),
- counter impulses/counting results and
- character strings.

In accordance with the Plant iT class concept, corresponding objects are created and parameterised for the recording of these values. The standard system includes additional types of objects that provide particular functions. They can be used either for data recording or processing:

- Manual input objects allow the input of parameterised data points (e.g. laboratory values).

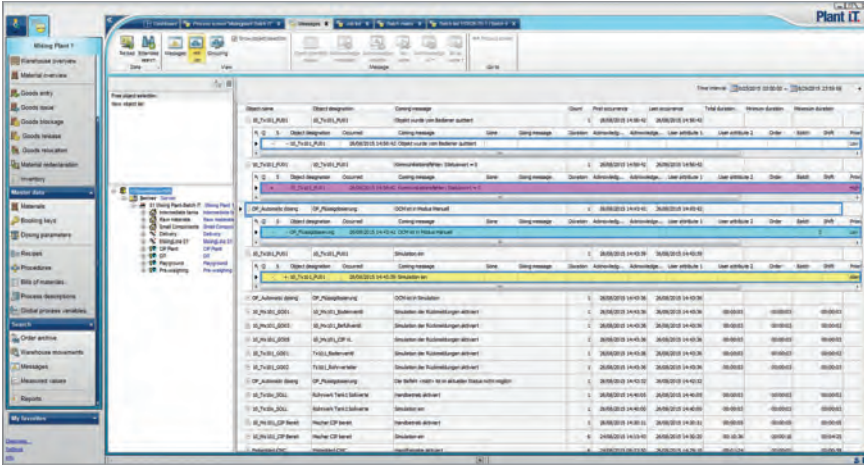
- Formula objects enable the direct mathematical and logical processing of recorded measurements (e.g. the simultaneous calculation of derived values and the acquisition of the actually measured value).
- Event objects can trigger complex activities in the system (e.g. batch switch-over or automatic reporting).
- Maintenance objects offer the possibility of setting up counters for operating hours and switching cycles. They create the basis for using a maintenance management system.

### Data analysis

Plant Acquis iT provides the fundamental functions for the immediate analysis of production data:

- Trend representation of analogue and binary data in terms of freely parameterizable and storable views
- Efficient error handling by means of freely parameterizable message groups and profiles
- Weak-point analysis with the help of message hit lists, e.g. analysis of error messages according to frequency or length of appearance

Data may be selected either by time periods, orders or batches. The results can be further refined by easily selecting from entire plant areas, individual units or single objects. For more complex analysis the system offers a data export add-in to Microsoft Excel.



Messages in the Operation Manager

### Visualization

Plant Acquis iT also includes a visualization feature. The focus is on providing plant or unit-related status overviews in combination with single, operator-controlled entry of set points. In respect to the functional principle and the applied engineering tools, the visualization feature is fully compatible with the visualization Plant Direct iT offers. The use of identical infrastructure allows visualization functions of Plant Acquis iT and Plant Direct iT to be combined in a homogeneous operator interface.

### Open for extensions

Due to its open architecture Plant Acquis iT provides optimal possibilities for application specific enhancements like Excel-based reporting or filling and packaging management.

Via macro enabled standard interfaces Microsoft Excel accesses the central database and enables the flexible creation of reports. The advantages:

- Utilisation of powerful analytic and presentation functions of Microsoft Excel allows design of tailor made

reports based on the acquired production data

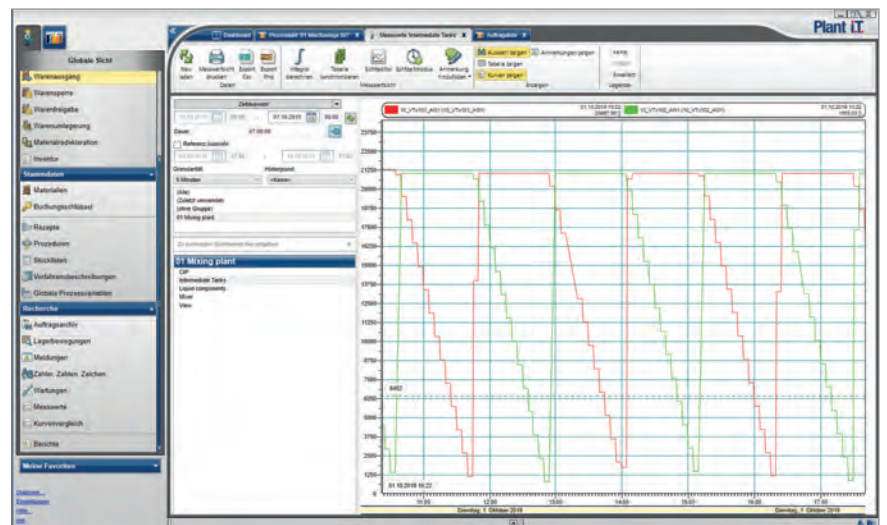
- Users familiar with Microsoft Excel can customise reports to suit their requirements

As an alternative the system also offers open interfaces for integration into HTML or XML-based reporting.

Plant Acquis iT also provides a good basis for filling and packaging management and can provide functionality like:

- line-related order lists including data exchange with sub-ordinated control systems,
- plant monitoring,
- filler stop analysis,
- error analysis and
- performance analysis (e.g. following OEE).

These functions strongly support the operating company in optimising the plant performance.



View of measured values in the Operation Manager

## Plant Acquis iT Messenger Automatic Messaging Service

Besides clearly structured visualization techniques and high-performance data management solutions, reliable alarm systems are an indispensable component for the automation of processing plants.

Using Plant Acquis iT Messenger, plant operators are always kept informed, even when they are not actually on site. In its role as a remote messaging system, the add-on notifies responsible staff in the event of critical alarms.

It is possible to set individually which type of message is sent at which time to which person and via which channel. The triggered messages are subsequently logged and archived in the Plant iT system.

The Plant Acquis iT Messenger supports the following communication channels:

- Short Message Services (SMS)
- E-mail (SMTP)

Messages that are not marked as received within a predefined period of time are sent directly to the next recipient specified in the escalation plan.

The add-on can be optionally installed as long as the various communication methods are supported on-site by the necessary technical infrastructure.

**Edit Alarm**

Name: Heating Failure

Active:

Description: In case of heating failure send SMS message to maintenance. If maintenance does not respond, send SMS to the gate.

Times (+)

Incident (-)

Delay: 30 Seconds

Debouncing: 60 Seconds

Limitation: 5 Per day

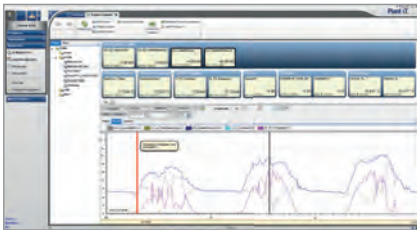
Source: Reporting system

Parameter	Name	Operation	Value
Alarm attribute 1	event	▲	
Location level 1	even	Heating	
Kind of alarm	ts	Fault message, warning	
Alarm parameter 2	time	15	

Messages (-)

Name	Notification	Response	Response Code	End by Response
Schaefer	E-mail	No		Ja
Maintenance	SMS	Yes	0815	Ja
Gatekeeper	SMS	Yes	4711	Ja

## Plant Acquis iT EnMS Energy Management System



Plant Acquis iT EnMS is fully integrated in the user interface of the process control system.

Plant Acquis iT EnMS is the energy management system from Plant iT and can be integrated as a process control system add-on at any time. It allows production firms to realise their full potential for improving energy efficiency, to determine and document energy consumption for the production plant and to constantly improve energy consumption.

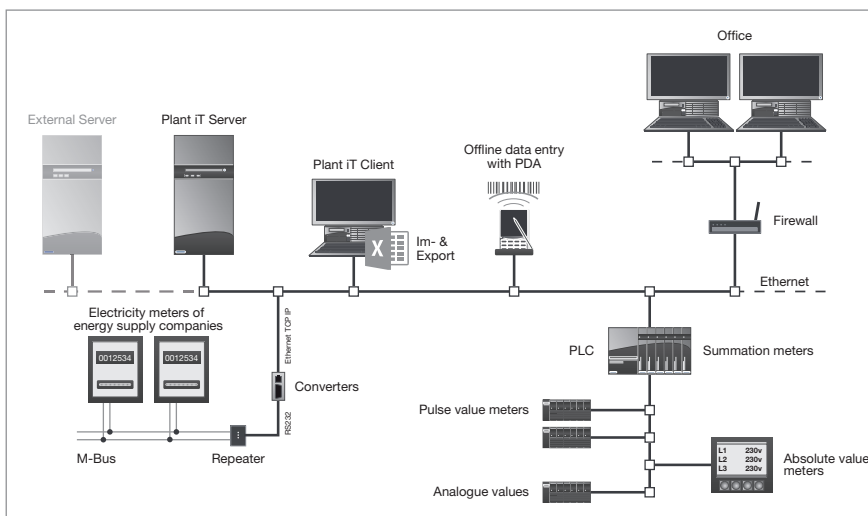
The basis for an energy management system (EnMS) is the recording of all the as-is states of primary and secondary energy sources and other media. A detailed analysis is carried out via energy monitoring. This data is subsequently displayed through uniform reporting – compared with variables over various time periods. The parameters of the intelligent alarm system (when rapidly approaching or exceeding limit values) are set using defined limit values for load peaks and consumers. This enables operators to take precautionary action: Load peaks are avoided and load valleys used in the best way possible.

### Energy data acquisition

Plant Acquis iT EnMS enables several methods of intelligent energy data acquisition. The traditional method of acquisition contains, for example, the metered values from pulse and absolute value meters, calculated (virtual) meters, summation meters, integral meters, differential meters and analogue values (e.g. ambient temperature). Depending on the available interface, the supply meters of energy supply companies can be connected directly, e.g., via M-Bus and respective converters. Furthermore, Plant Acquis iT EnMS supports the offline acquisition of energy values with the aid of mobile data acquisition devices (PDAs). These identify the meters using barcode labels and thus enable the manual input of meter values. Additionally, the import and export of data can occur via MS Excel.

Plant Acquis iT EnMS supports the data transfer of energy values both from the Plant iT server and from external servers and databases. The evaluation and analysis of this data can occur either at a workstation (Plant iT Client) of the process control system or alternatively at an external office PC with the aid of an energy frontend.

Secure your competitive advantage with Plant Acquis iT EnMS and profit from a qualified energy management system according to the regulations of the German Federal Office for Economic Affairs and Export Control (BAFA). Small and mid-size businesses but also major corporations use our energy management system. We will be happy to provide you with a tailor-made plan and introduce Plant Acquis iT EnMS in your company.



Architecture of energy data acquisition with Plant Acquis iT EnMS

## Plant Acquis iT LMS Line Management System

Bottling and packaging of drinks and foodstuffs are the final steps in the value-added chain of food production. Avoiding downtime is a major challenge, because downtime means losses. Since even the shortest amount of downtime, so-called micro-stops, can reduce a system's effectiveness significantly. Improvements are only possible when the key causes of downtime can be identified. Within this context, a Line Management System provides a great solution and helps to determine the causes of downtime. Plant Acquis iT LMS from ProLeiT offers an add-on for the production data management system Plant Acquis iT, thus enabling simple access into the world of Line Management.

In contrast to traditional LMS solutions, Plant Acquis iT LMS allows fast, simple and cost-effective implementation with reduced sensor technology, licensing and engineering requirements. Additional features provided by the add-on include an interface to existing ERP systems, and thanks to user-friendly operation via a web browser, the time-consuming and complex task of installing a client is no longer necessary.

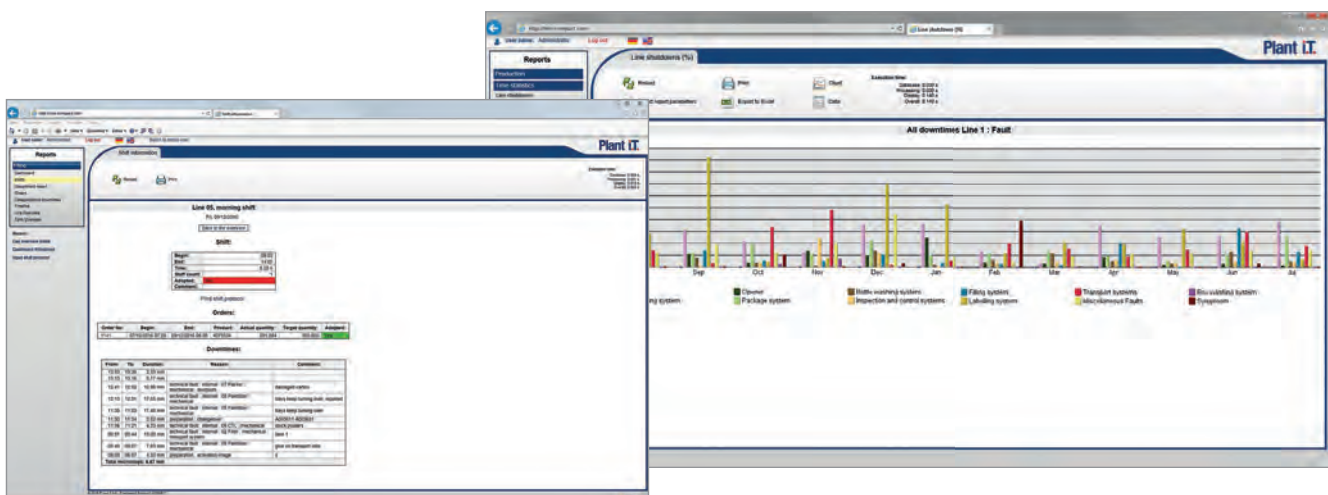
### Minimising downtime, maximising plant efficiency

Plant Acquis iT LMS records system and machine downtime automatically, reliably and exactly. The causes of downtime and other system or order-related data can be entered at any time manually via drop-down boxes. And predefined causes of faults can be enhanced and extended according to your individual needs. The threshold value for micro-faults can also be defined individually.

The entire data can be analysed down to the finest detail with the help of the drill-down-function: downtime periods can then be arranged hierarchically with varying levels of detail from the overall bottling plant to individual units. Plant Acquis iT LMS then outputs the generated reports at every office PC in the Intranet or on smartphones and tablets. Furthermore, customer-specific data can be entered and evaluated.

### Optimum performance thanks to comprehensive functions

The extensive range of the add-on Plant Acquis iT LMS addresses the needs of varying professional groups in the process engineering industry: for instance, production managers profit from the fast, web-based lists stating the causes and times of faults, while supervisors can use a generated report to gain an overview of the current plant situation before starting a shift. The user-friendly, menu-guided user interface allows plant operators to quickly and, in particular, consistently determine the causes of faults. Paper-based recording, which was always prone to errors, is now a thing of the past. Maintenance staff can extend Plant Acquis iT LMS simply by configuring parameters. They are also provided with a quick overview of a plant's weak points and can identify its potentials for optimization.



Shift record and malfunction periods overview in Plant Acquis iT LMS

# Base system



facility. The high level of standardisation of our control systems guarantees numerous advantages, such as the simplification of processes (engineering) or the application of a standard user interface (operation). The latter means that an overview of extremely complex production methods can even be delivered for staff at various production sites: irrespective of whether they are in Europe or the USA using Siemens or Rockwell Automation controllers.

Our transparent and compiler-less process control system Plant iT has a modular design and complies with the principle of “parameterisation instead of programming”. This enables us to carry out add-ons or modifications without having to stop production. The elimination of individual programming codes ultimately leads to a highly transparent and flexible automation solution. The central engineering environment with a common database for all the base systems and modules enables rapid commissioning and reduces the amount of required maintenance and add-ons for future applications.

## Process control

There are SCADA solutions and process control systems that offer little or no industry functionality whatsoever. Some systems only cover the functionality of a certain type of machine or a specific process sector. However, this prevents integrated information processing. Plant and machine manufacturers are increasingly faced with the challenge of these problems and therefore demand a centralised, efficient and industry-based overall solution for integrated automated production plants.

Plant iT offers this centralised solution for our core industries: food & beverage industry and pharmaceutical & chemicals industry. Our process control systems allow the integration of all production line processes or an entire production

# Plant Direct iT

## Process control system

Plant Direct iT includes – beside the functionality of Plant Acquis iT – an extensive set of technical and technological, pre-configured automation classes. The range of technical classes includes a functionality for e.g. valves, drives, controllers, and controlling frequency converters. The technological classes, on the other hand, provide the functionality for mapping process sequences. The main representatives of this group are phase controllers, the Object Control Matrix (OCM) and the logic class. Using these classes, the parameters of the process functionality become fully configurable – from the valve to the sequence control.

### Parameterisation instead of programming

Plant Direct iT supports parameter-based process control. This ensures that previously parameterised sequences can be varied easily by dynamically combining them with various parameter sets, i.e. for considering different operating modes of a plant or products to be processed.

The client/server architecture, the intuitive user interface and the object-related class concept turn Plant Direct iT into a future-proof automation solution in comparison to traditionally programmed controls with higher-order visualization.

### Intelligent automation classes

A secure process control, combined with maximum transparency for the operator's staff, and efficient engineering are the main requirements for a control system, irrespective of whether it is used for new plants, plant extensions or retrofitting. Plant Direct iT enables extensive parameterisation of technological functionalities. Only specific requirements have to be programmed directly. The class concept of Plant Direct iT guarantees the highest functional quality, as similar objects are controlled and monitored by just one software module. This ensures reusability and enables the effective qualification and validation of the system, if required.

Plant Direct iT provides maximum flexibility for interventions during operation and therefore reduces the frequency and duration of downtime. The system permits adaptations during production without neglecting safety aspects, since the system can log all changes in detail. This applies to all types of operation interaction as well as to any intervention with the system's engineering (Audit Trail).



Operator dialog of the class Analogue Input

## Class structure

A class in Plant iT includes a closed system consisting of three seamlessly integrated components and completely controls the function of a technical component (e.g. a valve) or an entire step-controlled process sequence:

### 1. Class description

The class description is located in the central database of the system server and includes the structured mapping of all the properties of this class, including all status information and the command set.

### 2. Operating dialogue (class dialogue)

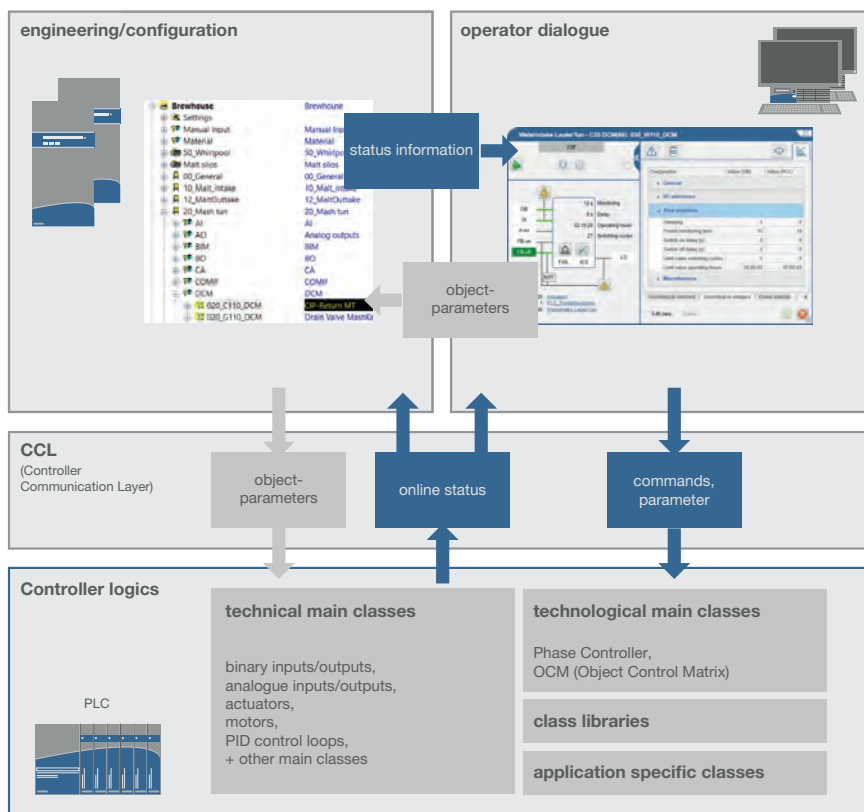
The operating dialogues are available to the operators in the process images on the client via which the system is controlled. Each individual object can be operated and monitored via the operating dialogues.

### 3. Control logic (class handler)

The control logic is implemented in the PLC and controls the technical component (e.g. the valve) via the I/O system. All the components form a functional unit and are synchronised with regard to status information and operating parameters. These parameters can be changed during operation. This provides maximum flexibility with regard to the selection of changes to be transferred and the time of transfer. If necessary, a single parameter can be changed for a specific object during operation.

The system standard already includes an extensive set of technical and technological classes which is constantly further developed. The basic technical classes range from a basically equipment-neutral functionality, e.g. valves, drives, measured values and controllers, through logic functions to highly-qualified, equipment-specific functions, e.g. complete control of a certain model range of frequency converters.

The Sequence Controller and the Object Control Matrix (OCM) provide two high-performance technological classes for mapping complete process sequences. The system additionally supports the development of further class libraries. The required infrastructure, including templates and documentation, is available in the system standard. Plant iT objects can be cascaded and provide an API, which permits access from conventional PLC code. Since the Plant iT system software and application-specific PLC programs can be operated in parallel in just one controller, the system also allows the realisation of very complex tasks.



The Plant iT automation class principle

## Creation of customer-specific classes

The transparency of Plant iT enables the development of individual standard automation classes, which can be seamlessly integrated into the system and flexibly combined with the base classes. Respective templates and documentations are part of the base system. Whether plant operators, machine or plant suppliers wish to standardise and encapsulate their know-how in individual classes, or system integrators use an individual class library as an efficient engineering tool and visible proof of their industry know-how - Plant Direct iT is the perfect platform.

## Integration from valve to sequence control

Plant Direct iT not only provides classes for technical objects, but also offers classes for parameterising complete process sequences according to various methods. Continuous processes are, in particular, preferably mapped by a purely interlock-based sequence

control. Besides the classes for automation objects, a logic class is available via which the activation and interlock conditions can be parameterised for each individual object.

The second method is the mapping of process sequences in the form of sequences for which Plant iT also provides the respective classes.

The “OCM” class enables the parameterisation of activations and the monitoring of a definable group of technical objects (actuators and sensors) for various activities that need to be executed in the process sequence. In a matrix, the parameters of each object are configured to determine how it should be treated when calling a specific individual activity (e.g. monitoring the “Off” and “Alarm” status for “Inherently safe” activity). The activities defined in an OCM can be called in any combination via a higher-order sequence control.

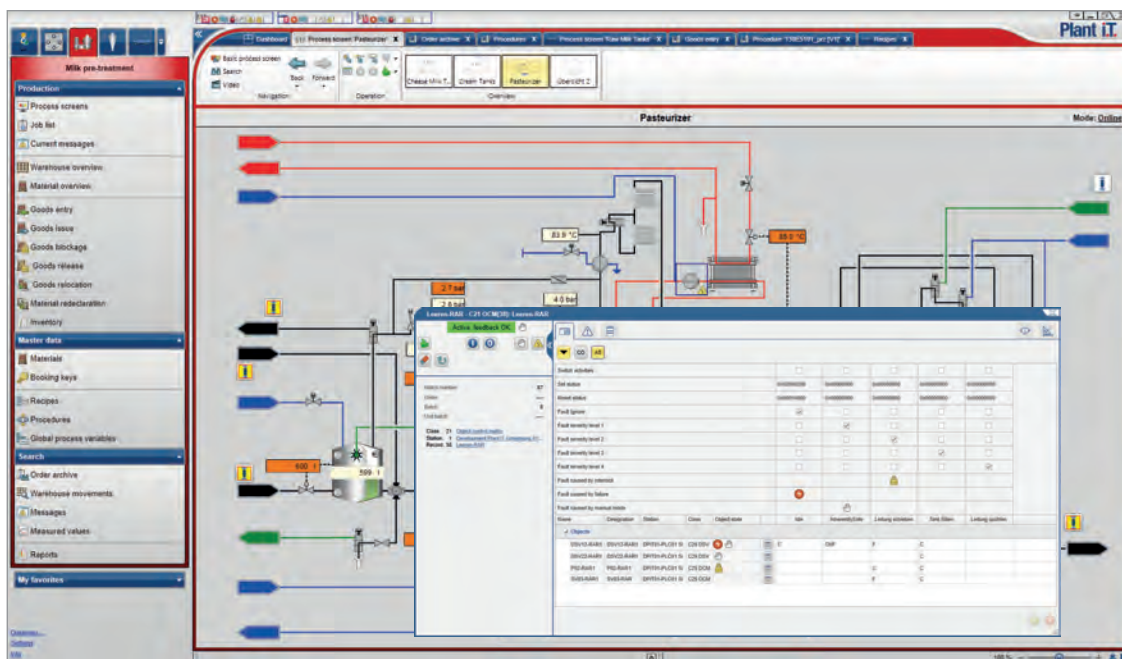
The “Phase Controller” class enables the parameterisation of entire process

steps, including the required transitions and branch targets. Calling OCM activities within these steps results in a completely parameterised sequence control.

Objects of these two classes can be implemented as independently operating instances, but are primarily intended to act within the context of a higher-order sequence control (e.g. Plant Liqui iT or Plant Batch iT) which dynamically provides them with order and recipe-specific parameters.

## Efficient source/target control

The application of Phase Controller and OCM enables variable process control with regard to the allocated plant resources. Parameterisation of the technical objects to be used by an OCM occurs as object lists which can be dynamically allocated to an OCM matrix. Activities for a specific sequence must therefore only be parameterised once. They can, however, be executed for various resources (e.g. source tanks) by combining different object lists.



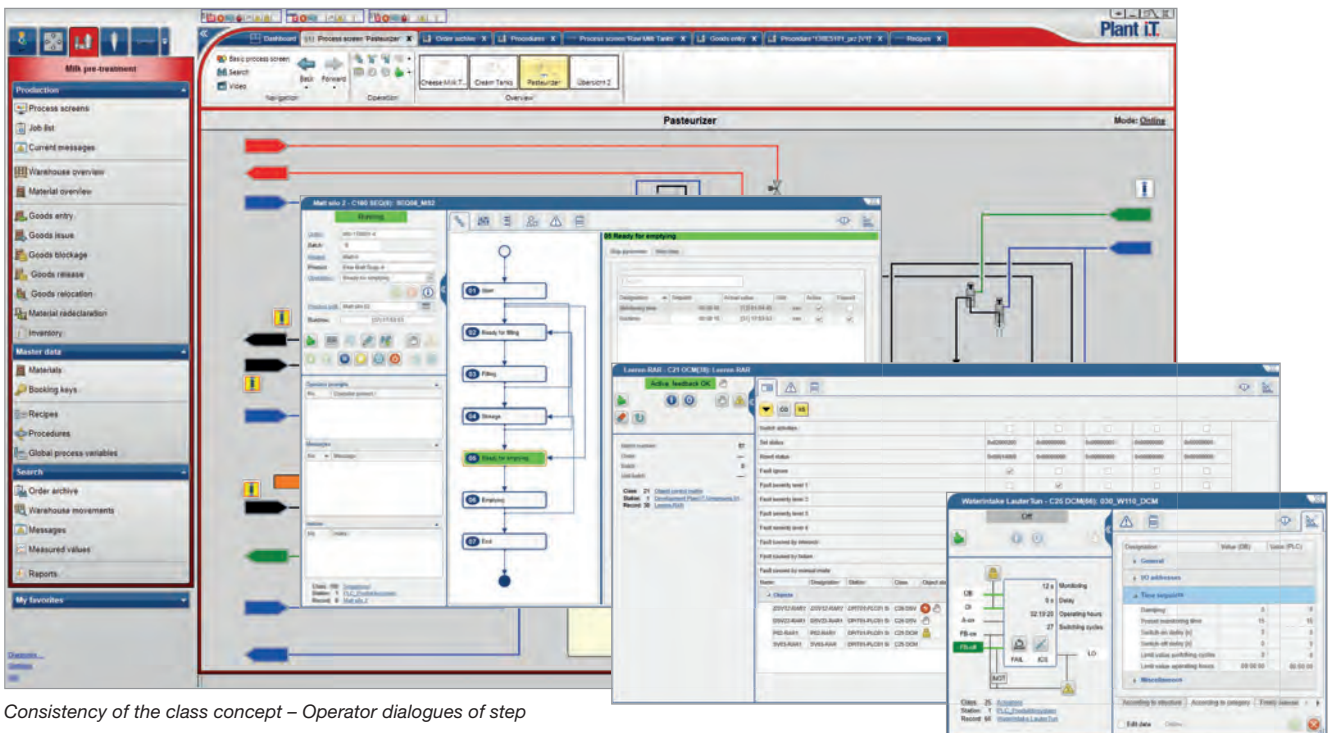
Object Control Matrix (OCM) with an automation object

## Material-related process control

Plant Direct iT allows the realisation of material-related automation solutions. Plant iT material, the module for process-related materials management, can be accessed directly from the process control. Transaction-accurate booking records can be created for each individual material transaction in more or less real-time from the current process via system-internal standard functions. This enables material-related process control, including inventory management, and – combined with a higher-order order management – batch tracing.

## Automatic record and playback of process activities

The unique Plant Direct iT Visu-Recorder automatically records and provides playback of process activity. The add-on runs directly within Plant iT. No additional hardware, software, or infrastructure is required. The recorded historical data from the process can be replayed directly from any operator workstation. The date and time in history, along with playback speed can be selected freely. While monitoring your plant in real-time, then being able to jump back in time to analyse and compare performance is an invaluable tool for developing best practice.



Consistency of the class concept – Operator dialogues of step sequence, OCM and an automation objec.

## Plant Direct iT Maintenance

### Maintenance management solution

Efficient maintenance planning is essential to ensure and maintain maximum plant availability. The add-on Plant Direct iT Maintenance is a parameterizable solution for evaluating and planning all maintenance tasks. Individual automation objects, such as valves, motors and frequency inverters, and entire package units, such as compressors, packers or pasteurization units, can be clearly managed thanks to the intuitively designed solution.

Plant Direct iT Maintenance provides the process industry with real potential for optimization in several respects: the extensive analysis functions allow maintenance staff to examine the maintenance objects with regard to varying categories, including operating cycles, operating hours or the service cycles defined in each case. Thanks to the add-on, shift supervisors can, at the start of each shift, gain an overview of which maintenance measures have been carried out and which production units need to be maintained/serviced in the near future. Production managers, on the other hand, benefit from greater machine and plant availability and the resulting increase in productivity.

#### Key functions at a glance:

- **Automatic evaluation of system classes,**
  - e. g. digital control module (DCM), motor control (MC) and user classes
- **Extensive analysis options**
  - Evaluation of the frequency and duration of operating cycles, operating hours and specified service cycles. If desired, the database can be exported to Excel.
- **Individual parameterization of maintenance**
  - Free parameterization options for any number of maintenance operations per object via operating cycles, operating hours or service cycles (also possible via Excel)
- **Transparency and operating convenience**
  - Reliable graphical representation with varying colour gradations for determining pending or already exceeded maintenance intervals
- **Graphical evaluation of operating cycles**
  - Clear mapping of operating cycles that have occurred with regard to frequency and duration per maintenance object (deviations per month / deviations per object)
- **Predictive maintenance**
  - Display of the expected next maintenance date based on collected data

## Plant Direct iT Visu-Recorder Record and play back of process visualization

The main goal of every company is to increase efficiency and productivity. However, there are factors that have a negative impact on productivity, throughput and performance. The challenge is to localise these factors quickly and intuitively!

Within this context, ProLeiT offers the Visu-Recorder, a unique add-on that automatically logs, records process activities of the control system automatically and plays them back within the visualization. This way, problems can subsequently identified quickly and process sequences constantly improved.

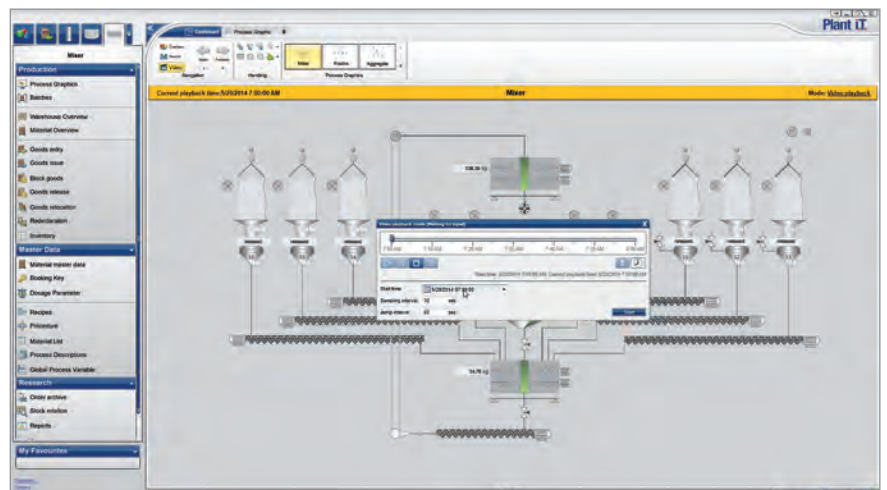
No additional hardware, software or infrastructure is required to install the add-on. The recorded, historical process data can be played back directly from every operating station of the control system.

Time, date and output speed can be freely selected in the dialogue window of the Visu-Recorder. It is also possible to change over at any time from current real-time monitoring of the production

plant to a historically selected point in time. Production analyses can therefore be carried out quickly and conveniently. Faults and disruptive factors can be identified efficiently and subsequently form the basis for, if necessary, required optimization measures.

The Visu-Recorder not only supports constant improvement of the plant but also the upskilling of staff and process optimization worldwide. The add-on is additionally a useful tool to shorten commissioning times significantly.

Thanks to the Visu-Recorder, process data does not have to be laboriously collected from various sources as tables and diagrams to map the state of the plant. The add-on automatically records – for all process areas – every activity of the process control system.



Operator dialogue of the Plant Direct iT Visu-Recorder

## Plant Direct iT Equipment Modules

### For context-specific applications

The various equipment modules (EMs) are context-specific applications and optionally available as an add-on for Plant iT systems. Depending on the plant section, manufacturer and function, various equipment modules are provided.

Examples of this include:

- **Equipment module PolyEM:** The EM Polygon calculates a value (Y of X) from a traverse line. Several traverse lines, consisting of 11 support points, are stored in the database. Using a sequence interface, a data set is, e.g. , selected according to the recipe and loaded in the PLC.
- **Equipment module WMEM:** The EM water mixer provides a downstream vessel (e.g. a mash tun) with water whose temperature and flow-rate can be adjusted. There are two different modes of operation available, one with two control valves and one with three control valves. Alternatively, a fixed positioning value mode can be operated via a chain of commands.
- **Equipment module AEM:** The EM agitator controls the agitator in a vessel or tank.
- **Equipment module CEM:** With the EM single-stage cooler, one cooler operates with a PID controller. The aim is to reduce the temperature of a product as constantly as possible.
- **Equipment module TEM:** The EM temperature zone is used for controlling the temperature. This module can control both cooling and heating zones via digital valves and via control valves with analogue signals.
- **Equipment module HEM:** The EM heating zone is used for controlling the temperature. It can control heating zones via digital valves and via control valves with analogue signals.
- **Equipment module EZKEM:** The EM single zone cooling cools a vessel to a target temperature. Up to eight valves can be controlled depending on the fill level.
- **Equipment module EWMEM:** Thanks to an additional decoupling filter, the extended EM water mixer controls the temperature and the flow rate of a water mixer.
- **Equipment module AEEM:** The EM extract value uses at least two extract values entered at specific times to determine when the stipulated target extract value is or will be reached.

# Base system



## Automation of continuous processes

Production plants in the beverage industry are often characterised by traditional plant structures and outdated control system technology. Existing stand-alone solutions prevent continuous communication between individual areas of the plant. This is further complicated if SCADA or control systems from various manufacturers, which are unable to communicate with each other at all or only to a limited extent, are used for individual process areas or manufacturing cells. This inevitably leads to reduced performance, as the required level of transparency in conjunction with uniform and centralised automated data acquisition cannot be guaranteed. A measurement of standardised key productivity figures

is thus time-consuming and prone to errors due to numerous manual transfers.

Our process control systems, on the other hand, offer the necessary integration – from goods receipt automation, through production to actual product filling – while ensuring compliance to EU Directive 178/2002. We recognised the specific demands of the beverage industry for more than 30 years ago, when we started developing our process control systems. This is why, Plant iT and brewmaxx are equipped with the appropriate functions.

# Plant Liqu iT

## Recipe management for liquid processes

Plant Liqu iT is particularly suitable for controlling and monitoring hybrid processes that contain a mixture of batch and continuous processes. The process control system Plant Direct iT including Plant Acquis iT are seamlessly integrated into Plant Liqu iT, thus offering users the perfect combination of operating convenience, safety and transparency. Plant Liqu iT offers additional automation classes, which have been built to match the requirements of the beverage industry and covers the following key functions:

- Sequence-based process control with configurable parameters and complete integration of the process control system Plant Direct iT
- Technology-related recipe control (definition of procedures consisting of one or several sequences and their combination with dynamically selectable parameter sets)
- Special technological classes, e.g. for realising transfer processes with automatic change of source or target tanks
- Automatic route control (routing) as well as
- Special functions for tank farm management

When using Plant Liqu iT in combination with Plant iT material, additional material classes, including material parameter management and inventory management, are additionally available as well as complete batch tracing in case of an order-related operating mode.

Similar to all other components of the Plant iT system range, Plant Liqu iT and

all its functions comply with the principle of “parameterisation instead of programming” and the open system architecture principle. If necessary, Plant Liqu iT also provides the respective interfaces for the software-related integration of application-specific solutions.

### The “sequence” class

Plant Liqu iT enhances Plant Direct iT with the option of mapping entire technical and order-related processes in sequences. Each sequence is a class instance with fully configurable parameters in terms of the defined steps, functionality within these steps and their transitions (branching points and step enabling conditions). When engineering the step-internal functionality, already defined objects (e.g. valves, measuring points) and, in particular, the process-related class OCM (Object Control Matrix) are used. Plant Liqu iT classes which have been specifically tailored to the beverage industry (e.g. FIFO for handling queues and automatic tank changes) complete the basic functionality of Plant Liqu iT and enable the parameterisation of entire process sequences.

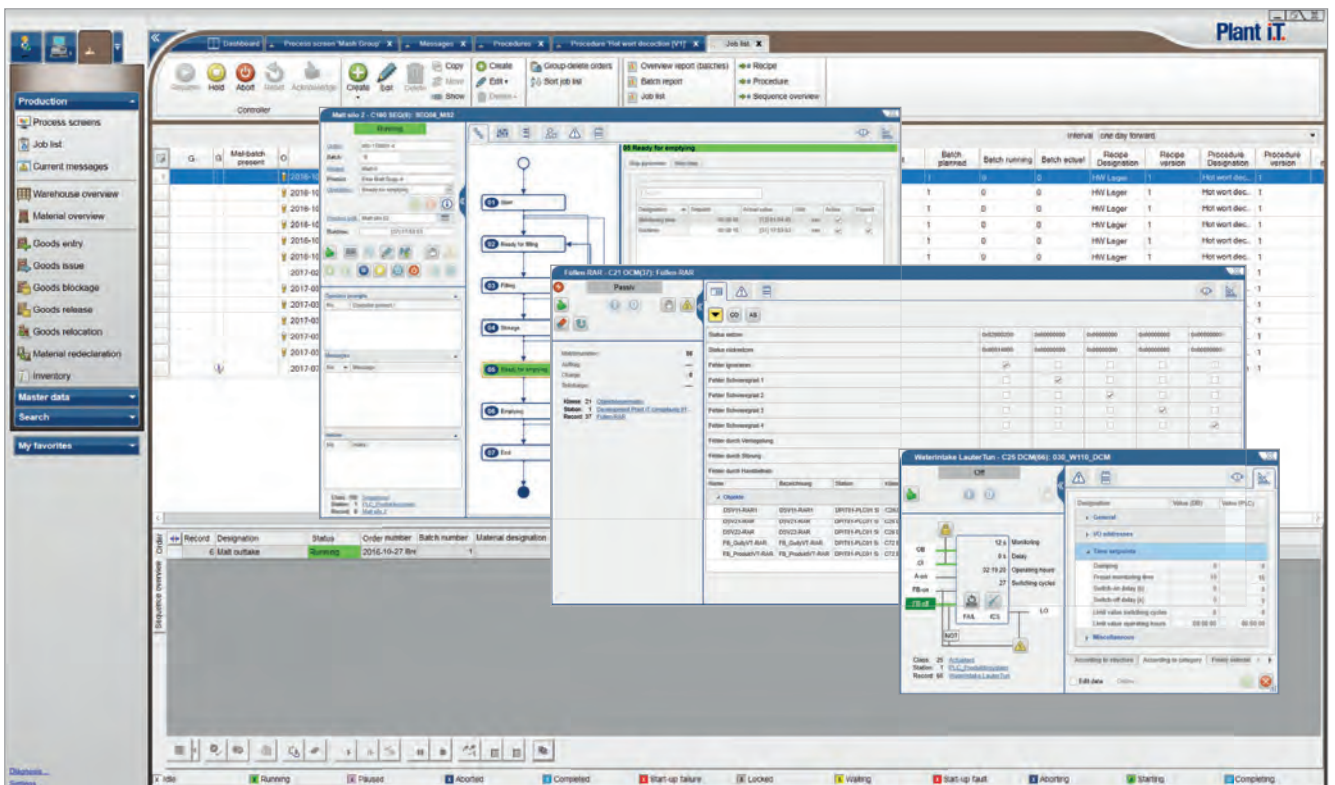
Each sequence can be monitored in detail via a separate operating dialogue and, if necessary, also controlled. An online view of the transitions of each sequence allows extensive analyses and direct intervention in the process sequence. All relevant events and data, including possible interventions, are recorded and subsequently available in a detailed sequence record for later checks and documentation purposes. During operation, an efficient sequence overview provides a precise overview of all the plant sequences and their current status at any time. If irregularities occur,

the operator can intervene directly from this overview.

### Recipe control

Particularly for plants where a wide range of products and semi-finished products are produced using the same or similar process sequences, Plant Liqui iT offers a special functionality for recipe-controlled processes based on a simplified procedural model. Process sequences are described as procedures, consisting of one or several sub-procedures which in turn include one or several operations. Each sub-procedure equals an instance of the “sequence” class and the steps defined for this instance represent the operations. By combining this type of procedure with various parameter sets

of the same structure, it is possible to generate master recipes, e.g. for producing various products with the same procedure. The system differentiates between recipe and equipment parameters. Recipe parameters are dependent on products. Various replacement methods are available for the recipe parameters; these methods specify for each parameter whether it should be treated as a constant with regard to a recipe or can be individually specified at the beginning of a process sequence. Equipment parameters are always independent on products. They describe technical properties of the plant and are thus generally treated as constants.

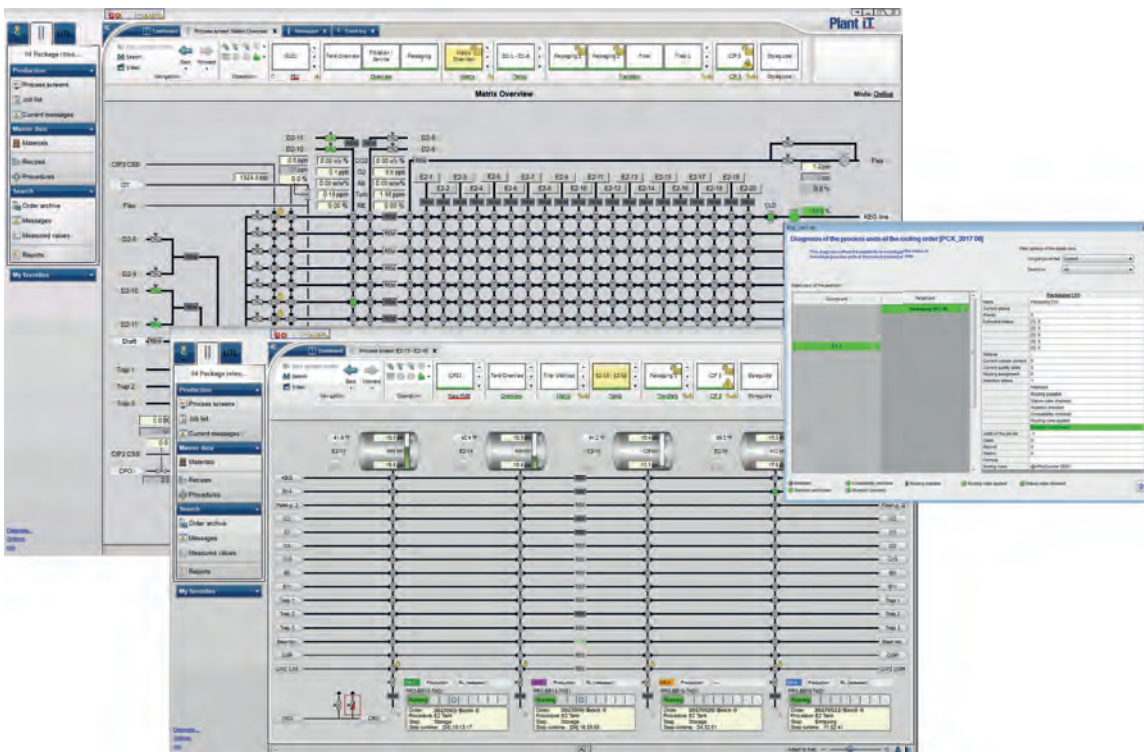


From order list to step sequence and from OCM directly to the valve

## Route control (routing)

For multi-product plants with a network structure, Plant Liqu iT enables the complete parameterisation of the usually complex mapping of various routes which might have to be selected depending on the product. This considerably facilitates operation and system adaptations for modifications, extensions or procedure adjustments. A special equipment module, the REM (Route Equipment Module), in connection with OCM objects enables the parameterisation of a fully automatic route control. The sequence addresses a variable number of REM objects which can be allocated to it either statically (technically determined routes) or dynamically (source, target or product-dependent

routes). Depending on the part routes or plant sections to be used, each REM addresses statically or dynamically allocated OCMs which check the actuator and sensors allocated to them.



Plant Liqu iT Routing Management

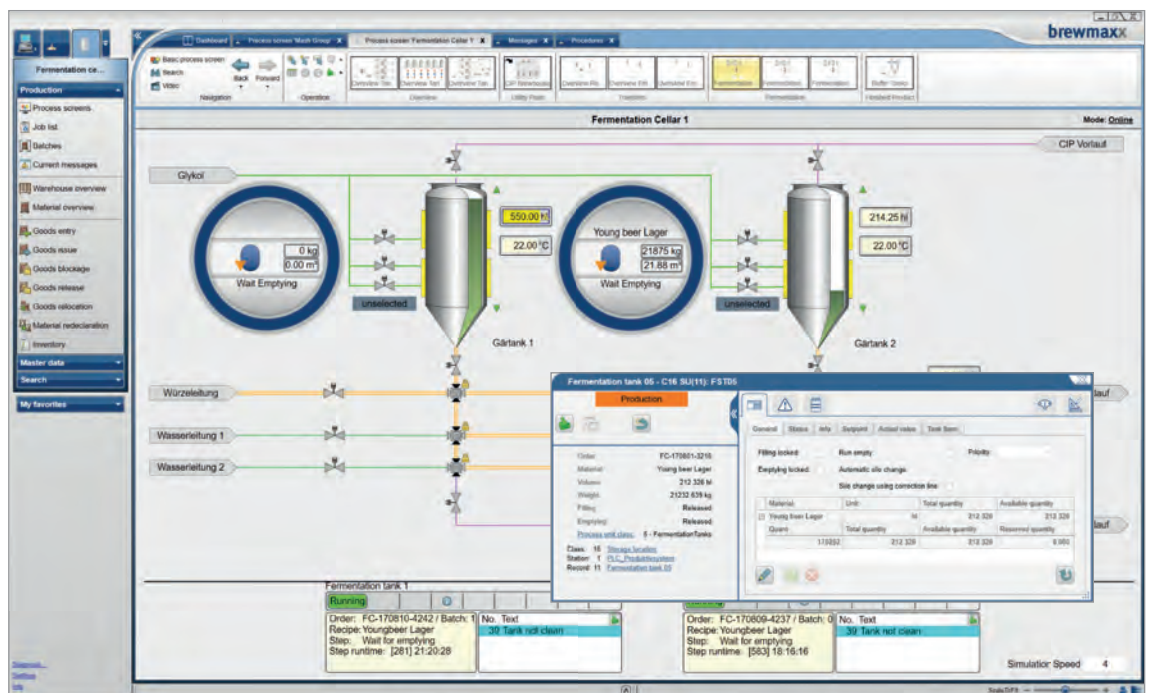
## Tank farm management

Especially for mapping processes with a high number of source/target combinations, Plant Liqui iT offers two efficient tools for handling tank farms - the Tank Farm Wizard and the Tank Farm Overview. The Tank Farm Wizard provides parameterisation help, enabling the parameterisation of complex tank farms, including the permissible route combinations and interlocks. Adaptations in case of extensions or modifications can thus be planned easily and accurately. The Tank Farm Overview offers a detailed multi-layer online view of the current statuses of the entire tank farm, a tank group or a single tank. All the key parameters (e.g. filling quantity, cleaning status, current order) and the currently executed process steps (e.g. filling, emptying, cleaning) are presented

in a clear and concise manner. If irregularities are detected using the tank status display, the operator can access the operating dialogues of the respective tank directly from the overview of the process image.

## Material-related process control

Plant iT material, the system component for process-related materials management, can be accessed directly from the process control. Transaction-accurate booking records can be created for each individual material transaction more or less in real-time from the current process via system-internal standard functions. This enables material-related process control including inventory management, order management and batch tracing.



Tank farm process picture with operator dialogue

# Plant Liqu iT Routing Management

## Routing Management System

Using the optionally available add-on Routing Management, it is possible to integrate the route control of Plant Liqu iT rule-based routing orders with a dynamic route search and allocation into order processing. A major advantage of the add-on is the opportunity to accept the routes or a part of the routes are already engineered in the FIFO (First In, First Out) sequences in the route engineering.

### Integrated in the standard user interface

Operation of the Routing Management occurs via the Plant Liqu iT standard user interface, the Operation Manager. When using the Routing Management, the user interface is extended with additional tabs in the following dialogues:

- **Order list:** The «Routing» tab is added to the order list in the detailed information on the selected order. This is where the route is displayed and, if necessary, manual release takes place.
- **Order processing:** The extended «Routing» tab displays the route matrix. Furthermore, with manually created routing orders, the source, target and route can be manually selected.

### Simple planning of routing orders

Each process area contains a sub-folder for rule-based routing orders. This folder contains a route matrix in which the existing routes are planned per sequence. Several routing rules can be created for one rule-based routing order. A routing rule defines how the routing process is to be processed and how the order is started in the Operation Manager. The order template is also specified in the routing rule. The order template determines the sub-procedure to be started from the recipe or the procedure.

The prerequisite for the planning of routing processes requires a basic parameterisation of sequences with respective FIFO objects (First In, First Out), a suitable order template and a procedure or a recipe to be started by the routing process.

#### Application example:

*A user program in a PLC searches for a route to drain a tank. For this the user program creates an order with rule-based routing. The routing order then automatically selects a suitable target tank, starts the order and controls the sequence with the appropriate recipe. A route consists of the following plant sections and routes:*

- Source plant section
- Source route consisting of up to four line sections
- Main route consisting of up to four line sections (optional)
- Target route consisting of up to four line sections
- Target plant section

# Base system



Order and batch-related production data acquisition is provided by Plant Acquis iT, which is as well as Plant iT material an integral part of Plant Batch iT.

The seamless integration of the process control system Plant Direct iT into the batch system enables maximum flexibility during operation and complete process transparency from the production order to the individual actuator or sensor currently used for processing the order. Users can therefore use the plant's potential to the full, since interventions in the production are possible at any level and at any time and safeguarded by Plant Batch iT. Moreover, users can analyse and correct a possible fault without having to contact the technical staff.

## Main product features

- Compatible with ISA-88/ DIN IEC 61512
- Order management and processing
- Electronic Batch Recording according to CFR 21 Part 11
- Recipe management incl. bills of material and version management
- Parameterisation of sequences and creation of master recipes
- Integrated interfaces for Plant iT connect & Plant Integrate iT
- Including Plant Acquis iT, Plant Direct iT and Plant iT material

## Batch system according to ISA-88

Plant Batch iT is the central process control system for controlling and monitoring recipe-controlled batch processes. Plant Batch iT is the ideal automation solution for accurately handling the simultaneous processing of a wide variety of production orders for various products in just one plant.

Current standards, e. g. ISA-88, were consistently implemented while simultaneously considering real applications. The base system Plant Direct iT is completely integrated and covers the structural level of ISA-88 closest to the process.

# Plant Batch iT

## Recipe management for batch processes

With Plant Batch iT it is possible to implement the procedural, physical and recipe model as well as manage resources in accordance with ISA-88 in combination with an additional functionality resulting from our extensive experiences in automating recipe-controlled processes. Next to the availability of the production line as a structural element of a plant, three plant section types have been defined and implemented in the physical model. The use of

- storage units,
- processing units and
- transfer units

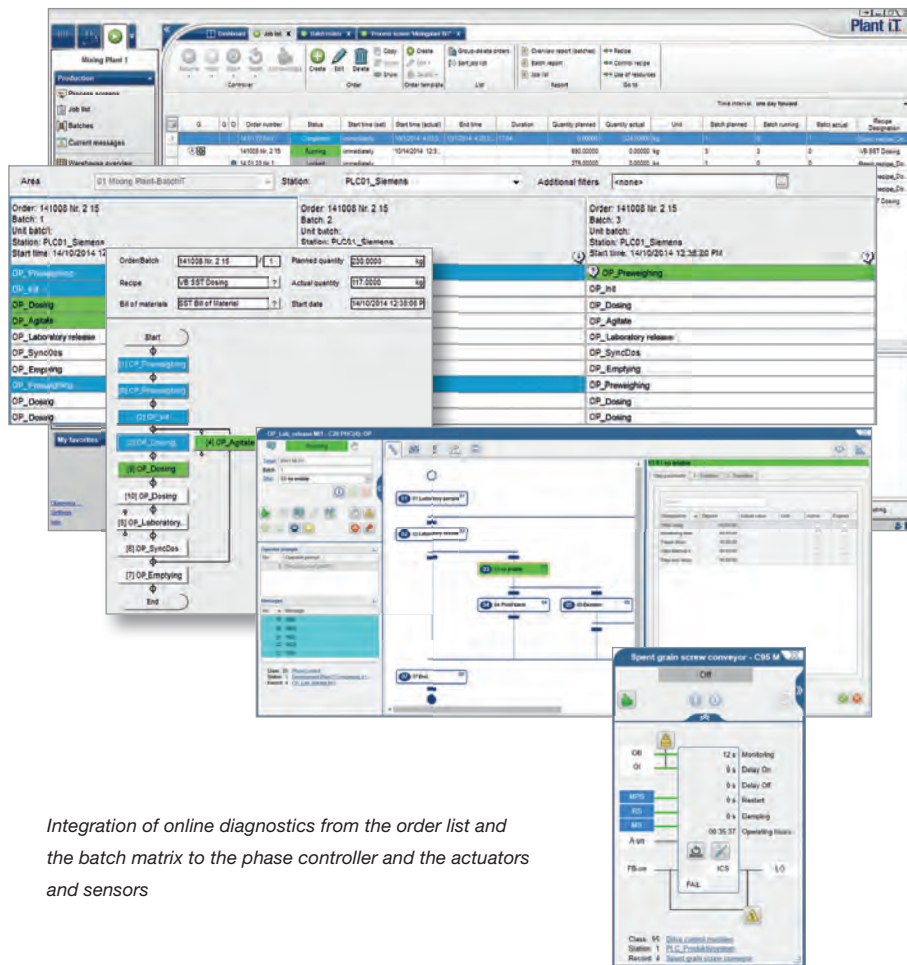
considers the fact that pure storage locations, “real” plant sections and pure transportation equipment, e. g. pipe systems, must be treated quite differently within the context of a batch system.

The strict interpretation of the ISA-88 recipe model would lead to unnecessary administration effort for many applications without achieving significantly enhanced process transparency. Plant Batch iT therefore simplifies the recipe model in several layers depending on the application requirements. The partial or complete breakup of the plant section into a structural element simplifies the master recipes with regard to their structure. For further simplification, the number of recipes to be administered can be reduced considerably through a special recipe model of Plant Batch iT.

### **BOM-based production**

Plant Batch iT can process so-called procedure descriptions while adhering to the separation of master and control recipes. In principle, they are master recipes which contain variables instead of precise product-related values. The generation of a control recipe then takes place during runtime via an order-related, dynamic combination of a procedure description with a bill of materials which can also include complex sets of recipe parameters besides a list of ingredients and quantities. This extended type of the recipe model has two main advantages:

- When producing a wide variety of products according to the same procedure, only a few procedure descriptions are required, i.e. the effort for maintaining the master recipes is reduced significantly
- The possibility of the BOM-based processing of production orders provides the ideal basis for efficient cooperation of Plant Batch iT and numerous ERP systems, as these systems usually “think” in bills of materials



Integration of online diagnostics from the order list and the batch matrix to the phase controller and the actuators and sensors

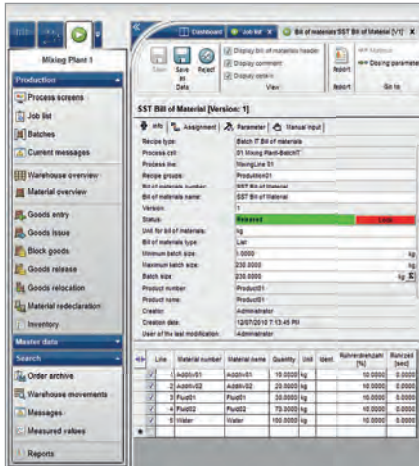
## Order management and processing

The central element for controlling and monitoring production is the order management of Plant Batch iT, which provides the production staff with three detailing levels:

- Order list
- Batch matrix
- Batch list

The order list offers an overview of all dispatched orders and individual batches of the order. All relevant order data and the current status are displayed online. Orders can be dispatched manually via the user interface of Plant Batch iT or via the standard interfaces of Plant iT from a higher-order system (e.g. SAP PP-PI). The batch matrix shows an online status overview table of all the batches being processed from the active orders, right down to the operation. The batch list provides a detailed overview of a single batch currently being processed and direct access to the operation-internal functionality, represented by an object of the Phase Controller class.

Interventions at order or batch level (e.g. start, stop, continue, cancel) are possible at any of the described levels. The batch list additionally allows the modification of all the recipe and order parameters for the operations which have not yet been started by the system. These types of intervention are recorded in the event log with reference to the order, batch and user.



View of a Plant Batch iT bill of material list

### Electronic Batch Recording

Plant Batch iT records all order and batch-relevant data and summarises it in an Electronic Batch Record (EBR). The batch record contains all the relevant header data of the production order to which the respective batch belongs and a detailed image of all the data similar to how it is displayed in the batch list at that time, as the batch is correctly completed or cancelled. The batch record can also be extended by:

- Step records of the Phase Controllers (operation-internal sequences),
- Graphical views of order-related production data
- Order-related message lists and measured value curves and
- Material movements

The batch records are available online for a freely definable period, but can also be exported or archived.

The screenshot displays the Plant Batch iT software interface. On the left is a navigation menu with options like 'Production', 'Process screens', 'Job list', 'Batches', 'Current messages', 'Warehouse overview', 'Material inventory', 'Goods entry', 'Goods leave', 'Block goods', 'Goods release', 'Goods relocation', 'Material redeclaration', 'Inventory', 'Master data', 'Search', 'Order archive', 'Warehouse movements', 'Messages', 'Measured values', and 'Reports'. The main area is divided into several panels:

- Overview:** Shows a list of batches with columns for Status, Operation Designation, Operation Instance, Raw material Designation, Source Designation, Transfer Designation, Target Designation, Start time, End time, Duration, and Plan.
- Batch graphical:** A vertical flowchart showing the sequence of operations: Start, OP\_Prewieghting, OP\_Prewieghting, OP\_Inf, OP\_Dosing, OP\_Agitate, OP\_Dosing, OP\_Dosing, OP\_Laboratory re..., OP\_SyncDios, OP\_Emptying, and End.
- Batch tabular:** A detailed table for a specific batch, showing columns for Quant, Vendor batch, Goods entry number, Storage location, Designation, Raw material Designation, Total amount, and Unit.
- Material movement:** A table showing material movements with columns for Designation, Raw material Designation, Total amount, and Unit.
- Measured values:** A section for monitoring and recording process data.
- Messages:** A section for displaying system or operator messages.
- Recipe parameters:** A section for defining and managing the production recipe.

**Phase log**

Operation: OP\_Dosing [OP\_Dosing I]  
 Start time: 10/14/2014 12:40:04 PM [GMT +00:00 (GMT Standard Time)]  
 End time: 10/14/2014 12:42:00 PM [GMT +00:00 (GMT Standard Time)]  
 Order number: 141008 Nr. 2 15  
 Batch number: 1  
 Running number: 15

Date	Time	Cycle counter	Line	Status	Name of phase	Designation of the phase	Pending command	Trigger for log entry
▼▼	10/14/2014 12:40:04 PM	1	2	Starting	01 Initializing	01 Initializing		Phase start, Command change, Status change
▼▼	10/14/2014 12:40:04 PM	3	2	Running	01 Initializing	01 Initializing		Phase end
▼▼	10/14/2014 12:40:04 PM	3	3	Running	02 Dosing rough	02 Dosing rough		Phase start
▼▼	10/14/2014 12:41:53 PM	546	3	Running	02 Dosing rough	02 Dosing rough	Resume after Pause/Hold/Locked	Phase end
▼▼	10/14/2014 12:41:53 PM	546	4	Running	03 Dosing fine	03 Dosing fine	Resume after Pause/Hold/Locked	Phase start
▼▼	10/14/2014 12:41:57 PM	566	4	Running	03 Dosing fine	03 Dosing fine	Resume after Pause/Hold/Locked	Phase end
▼▼	10/14/2014 12:41:57 PM	566	5	Running	04 Post run	04 Post run	Resume after Pause/Hold/Locked	Phase start
▼▼	10/14/2014 12:42:00 PM	580	5	Running	04 Post run	04 Post run	Resume after Pause/Hold/Locked	Phase end
▼▼	10/14/2014 12:42:00 PM	580	7	Running	05 Homogenizing	05 Homogenizing	Resume after Pause/Hold/Locked	Phase start, Result change of a monitoring function, Result change of a transition
▼▼	10/14/2014 12:42:00 PM	581	7	Running	05 Homogenizing	05 Homogenizing	Resume after Pause/Hold/Locked	Phase end
▼▼	10/14/2014 12:42:00 PM	584	6	Running	07 Final	07 Final	Resume after	Phase start, Result change

Order research in the order archive with batch view, material movements and phase protocol

## Integrated materials management with batch tracing

Raw materials, semi-finished products or finished products are the actual core resources of any process. The transaction-accurate tracing and precise allocation to individual orders and batches are essential for batch processes. In order to meet this requirement, Plant Batch iT is intrinsically tied to the process-related materials management Plant iT material. The generation of the booking records

required for inventory management and batch tracing is, whenever possible, carried out automatically by Plant Batch iT and in close coordination with the order and batch ID. To enable consistent and comfortable batch tracing, the evaluations carried out in Plant iT material allow direct branching to a batch record of Plant Batch iT and vice versa.

The screenshot displays the SAP Plant Batch iT interface. The main window shows a table of storage locations (Storage locations: 01 Wang Plant-Batch 0) with columns for Storage location, Storage location description, Material description, Total quantity, Available quantity, Locked quantity, Reserved quantity, Density (kg/m³), Measured value, Capacity (kg), Volume (m³), Priority, Floor empty, Automatic info change, Dis. change using or, and Filing locked. Below this, there are summary tables for 'Quart' and 'Plant' with columns for Quat, Goods entry number, Vendor batch, Container, Reserved quantity, Locked quantity, Total quantity, Available quantity, Best before date, Date of the first inward movement, Date of the last consumption, Complete, and Capacity (complete). The bottom section shows a 'Booking' table with columns for Booking, Booking type, Booking Desc, Order, Batch, Unit batch, Batch time, Quantity, Unit, Operator, Booking time, Completed, Operator (completed), and Order (No).

Integrated materials management

## Plant Batch iT MWS Manual Weighing System

Adding materials manually is a task that is regularly needed in the process industry. These may be anything from small quantities for laboratories to quantities recorded using platform scales. Potential sources of error at this stage are basically due to the fact that weighing orders are written down by hand and safety regulations are not met. Inefficient weighing processes and off-specification batches caused by erroneous additions additionally lead to reduced quality and a notable loss of time and raw materials.

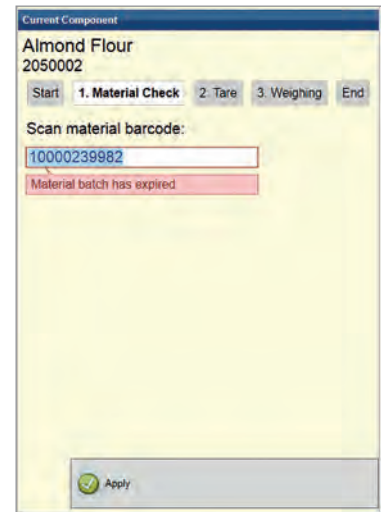
### Intelligent weighing assistant

ProLeiT's Manual Weighing System (MWS), an add-on for the modular process control system Plant iT, delivers an intelligent weighing assistant that enables the clear processing of bills of material while visually and reliably guiding operators through the weighing process aided by five colour grades. In order to offer the best possible support for processes at the operating station, the application contains workflow data, including, e.g., information about required protective clothing or how to handle certain materials.

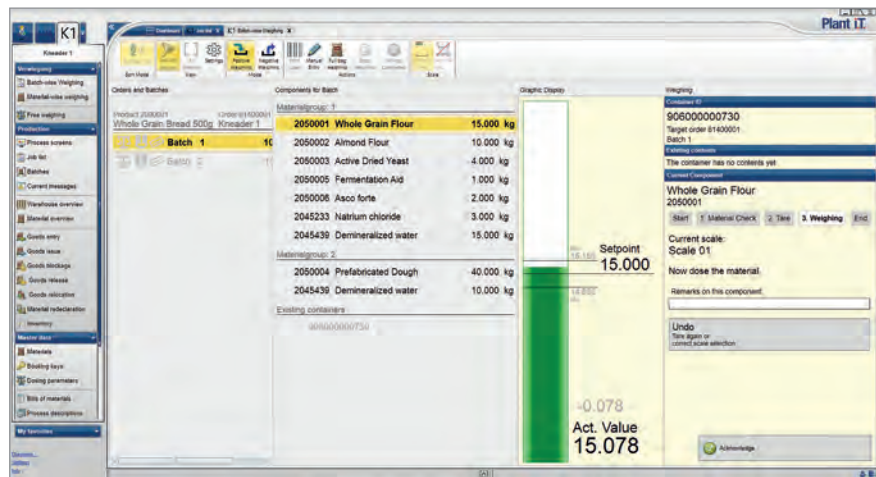
Furthermore, the MWS helps operators select the most suitable scales depending on the stipulated weighing and tolerance range. After completing a weighing process, a label can be created for the packaging. The barcode of this label integrates all relevant information about the order data, weighed components, including quantities, and, if necessary, handling and danger symbols.

### Optimization potential on all levels

The Manual Weighing System from ProLeiT helps to optimise weighing processes at every level of the process industry: Production managers profit from the traceability of the applied materials and can rely on improved safety standards due to the reliable operator guidance. Moreover, utilisation of barcodes and scanner ensures a particularly high level of safety when adding components. The work of staff at operating stations is significantly aided by clearly structured visualization techniques and stored workflows, while the complete overview of all existing production orders enhances rationalised work practices. The quality management system can also play a greater role in optimising weighing processes by customising workflows, thus guaranteeing adherence to customer-specific regulations and instructions at all times.



Operating dialogues in Plant Batch iT MWS



Weighing mask in Plant Batch iT MWS

# Base system



formation, as their core competency is the actual production process and not the optimization of accompanying production processes.

However, if manufacturing companies wish to retain or strengthen their market position, they must focus, in particular, on efficient production and process procedures. Production processes and product information have to be fully monitored and weaknesses minimised continuously. This is the only way to reduce manufacturing costs and maintain product quality. Nevertheless, a seamless data environment is essential to supply the right information for process optimization.

In recent years, manufacturing execution systems have become the established solution for these complex tasks. MES solutions can act as the data hub for a company, realising vertical and horizontal integration in real time. However, there is not always unanimous agreement on what MES actually means in each individual case and on the best way to implement MES solutions.

## Specific information

Increasing competitive pressure, growing globalisation, adherence to quality standards, legal obligations to provide electronic documents ...

Nonetheless, the production of food and goods has actually become easier due to the increasing automation of manufacturing processes. But this is also the reason why it has become easier for other companies to produce similar products to the same or better quality and at lower costs. Brand manufacturers, in particular, are faced with increasing competitive pressure. This situation is further exacerbated by increasingly strict regulations and legislation, e.g. the legal obligation to provide supporting documents for batch and product traceability. Many companies are overwhelmed by an irresistible flood of in-

### MES included

Our process control systems support the ISA-88 for process industries and S95 for MES. Our MES solution covers the following requirements and can give answers to the following questions:

- **Execution management –**  
What will be produced where and by whom?
- **Specifications management –**  
How do you want to produce?
- **Resources management –**  
Who will produce, what and where?
- **Data acquisition & analytics –**  
How was a product produced?
- **Tracking & Tracing –**  
When, where and by whom was a product produced?

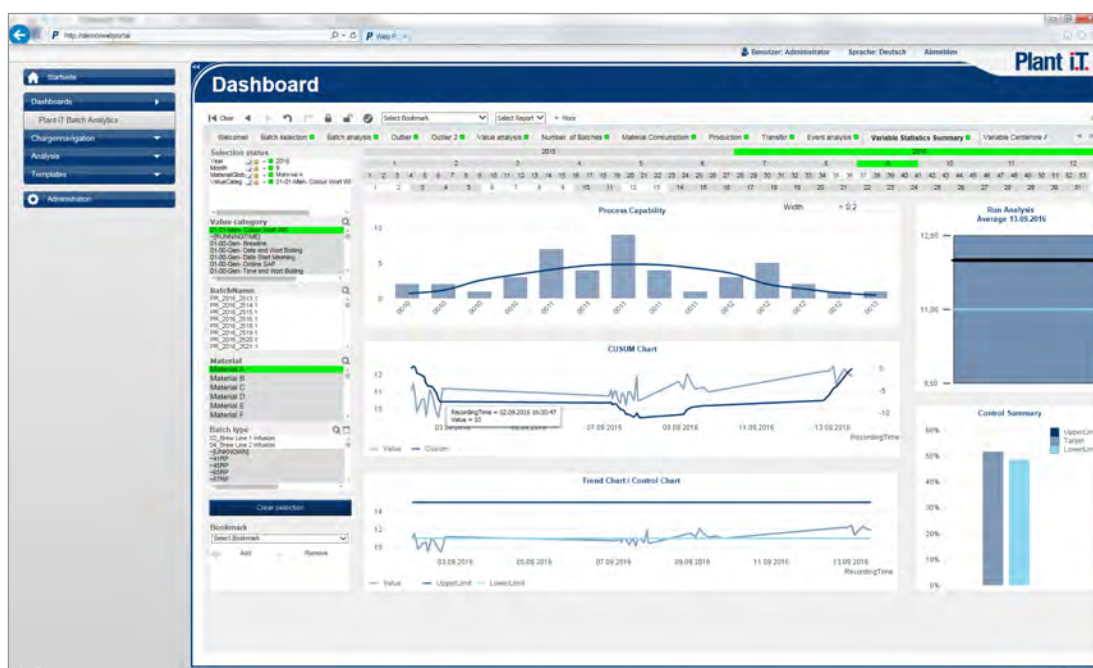
# Plant Integrate iT

## MES, Reporting & Analytics

Plant Integrate iT allows the “visualization” of all production data. A key prerequisite for achieving this objective is integrated information management at MES level, which can be integrated and operated infinitely across process sequences and departments. Plant Integrate iT can be used to merge and evaluate the required data from individual production areas. Access to this central information platform via Internet Browser occurs using Microsoft standard software and therefore provides maximum flexibility and protection when realising company-wide MES reporting systems.

### Reporting and integration services

Plant Integrate iT uses, amongst others, the Microsoft Reporting Services and the data model in the MES database. This database has been specifically developed for the integration of data from several servers and various production systems and to ensure efficient data import and export. This means, for instance, that direct requests with Excel are supported and standardised routes are provided when reporting. Furthermore, several languages and change traceability are thus guaranteed. Project-specific requirements can be easily extended thanks to the MES database structure.



The clearly structured dashboards in Plant Integrate iT enable data recording at a glance

The implementation of an MES reporting system with Plant Integrate iT therefore has a high level of standardisation, which can be extended as necessary by individual requirements. Standard functions include, for example:

- Report Designer for end users
- Background printing and report subscriptions
- Pivot tables and presentation graphics
- Interactivity (sort, open/close or switch to a follow-up or detailed report)

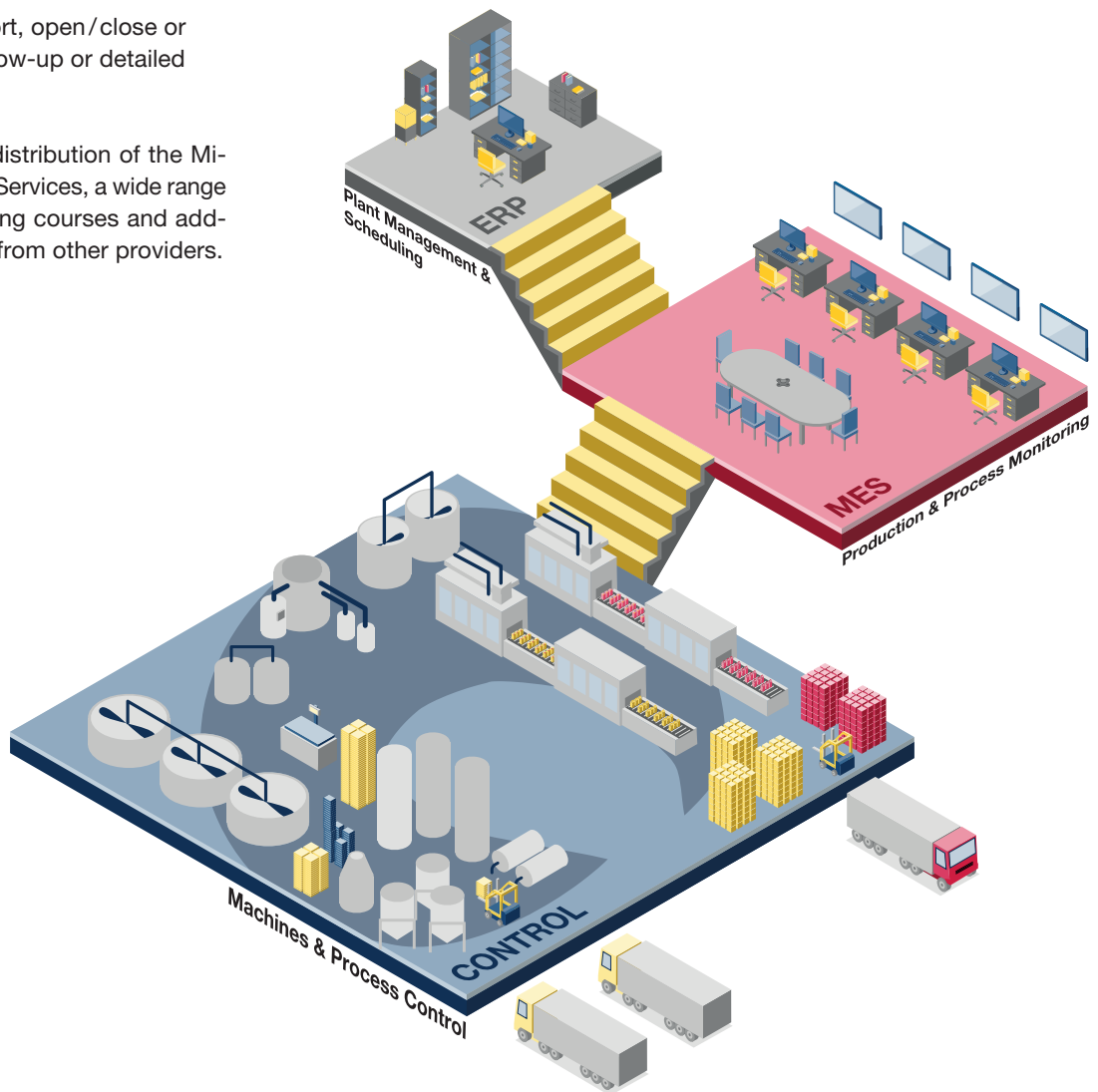
Due to the wide distribution of the Microsoft Reporting Services, a wide range of literature, training courses and add-ons are available from other providers.

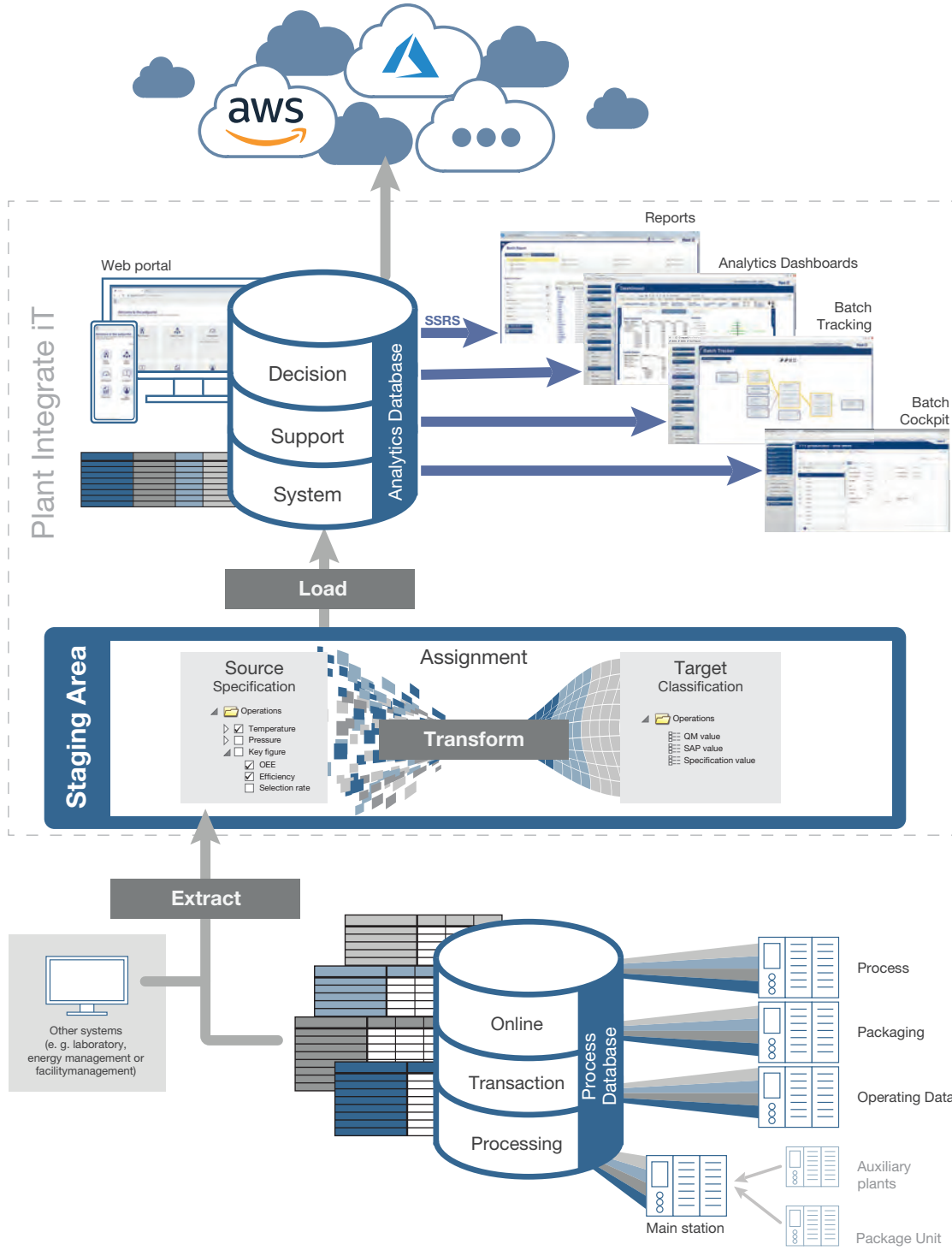
### Integration services

Based on the Microsoft Integration Services, Plant Integrate iT offers numerous new functions. The graphical engineering of data flows and program logic is therefore possible. Various standard interfaces (e.g. SQL, OLAP, Mail, FTP, Excel, ASCII, XML) are additionally available.

Plant Integrate iT supports the application of Integration Services due to:

- In-house developed components for interlinking SAP while retaining their configuration in the Configuration Manager
- In-house developed components to send telegrams to a PLC
- Logging and Audit-Trail of the transactions in the MES database web portal





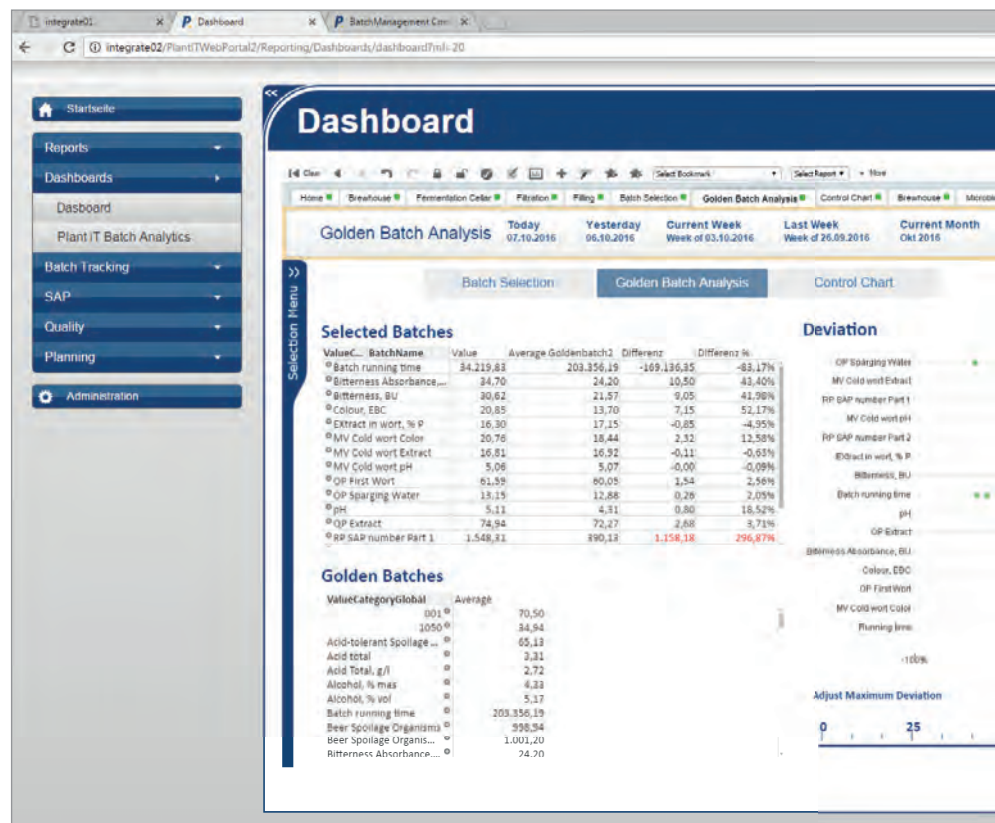
Plant Integrate iT – Processing of data via staging area into the MES database

## Analytics dashboards



Business Intelligence (BI) dashboards could be the base for company decisions. A fast access to all production-related information could be a clear competitive advantage especially for production plants with a high number of products and product variants. This is why so called analytic dashboards must have the following characteristics:

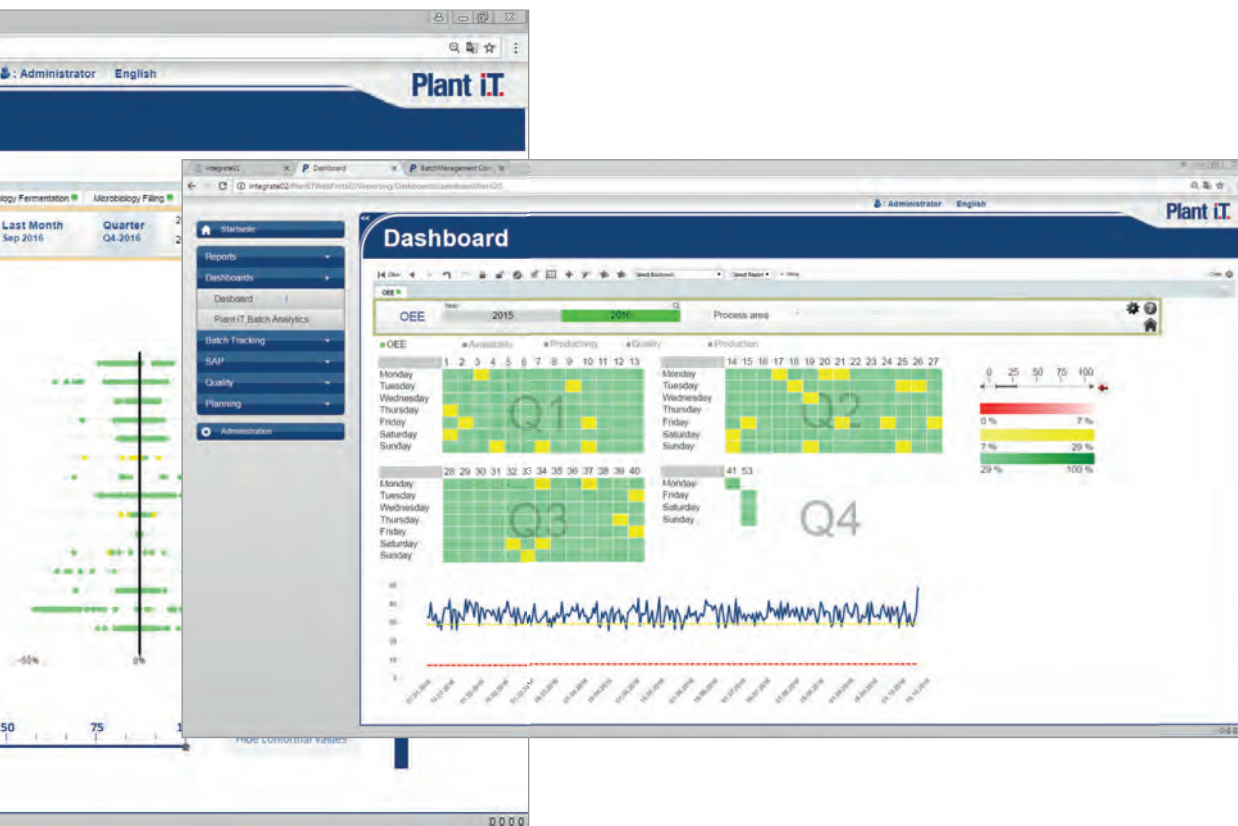
- Easy interfacing
- Quick creation
- Quick adoption
- High, interactive accessibility
- Easy to use



Examples of Plant Integrate iT analytics dashboards powered by QlikView

Business Discovery is a whole new way of doing things that puts the business user in control. Forget predefined analysis paths and long periods spent waiting for traditionally prepared, static reports. Combine data from various data sources – and receive direct answers to your questions. As a cooperation partner of Qlik, we can offer these functionalities to our customers, too. As of Version 9, the technology of Qlik is an integrated part of our systems. Various

software components of Qlik are used, especially for our MES reporting and workflow management systems. This seamless integration into our system databases offers our customers a better visualization of their information and an optimization of the display of these information on web-based and mobile (end user) devices.

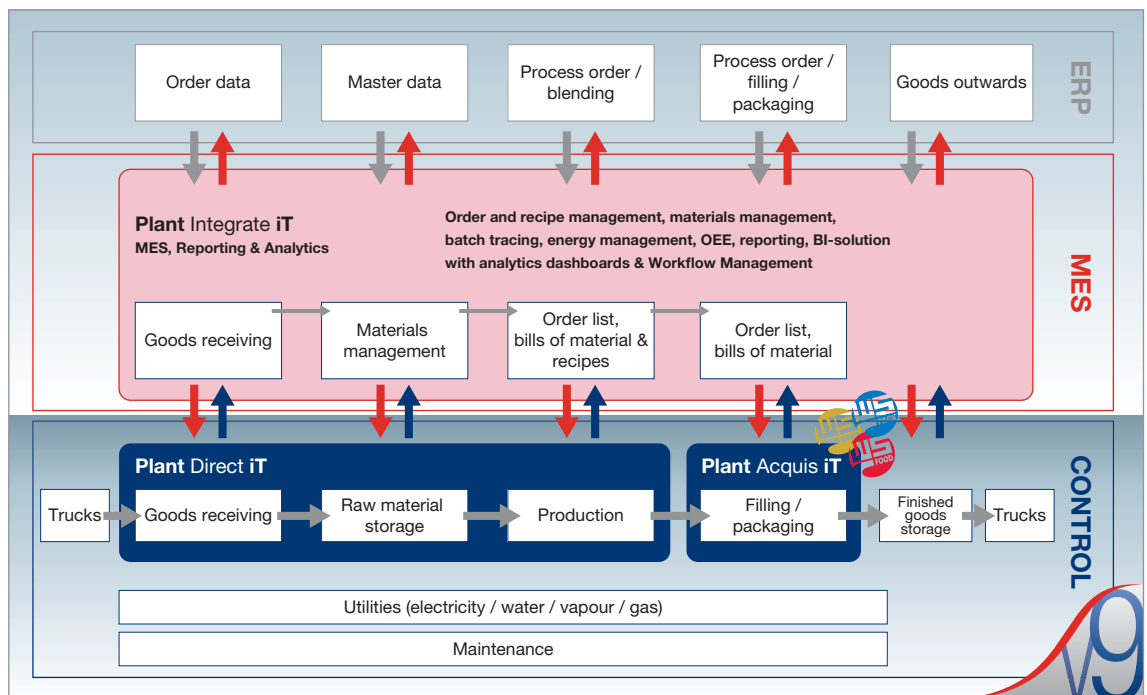


## Plant Integrate iT Workflow Management System

Plant Integrate iT provides an efficient MES workflow management system for production-relevant business processes. The database-supported system can be used for managing and monitoring automatic and manual processes in the production environment. This includes, for example, order processing, quality assurance (e.g. sampling) and the support of logistics processes or the collection and provision of data which arises during production and in the production environment. This data is used as the basis for production-relevant reporting and as a data source for higher-order systems.

The workflow management system can be used for the following MES areas:

- Warehouse and inventory management (e.g. product and material parameters, handling units, stock taking)
- Production management (e.g. recipe/BOM management, production logistics)
- Quality management (e.g. management of specification values)
- Maintenance and servicing (e.g. operating hour counter, machine maintenance, operating cycle counter)



Process information of a production plant





convenient and targeted analysis of the recorded production data. Moreover, off-specification batches can be tracked. Plant operators can view the data that is most valuable to them.

### Complete traceability

The Audit Trail function provided by Batch Cockpit allows you to review and analyse batch records. As a result, all changes can be traced in full at a glance – both in the front end and in the database. Audit Trail displays, among other things, information about the user, the applied end device and when the change was executed. Needless to say, this guarantees complete traceability at all times.

The Batch Cockpit from ProLeiT represents the entry point to integrated batch analysis. Thanks to seamless integration in other functions of our MES solution Plant Integrate iT, all the data can be further processed and prepared productively.

The image displays two screenshots of the Plant II software interface. The top screenshot shows the 'TT1 production - this week' overview page. It features a navigation menu on the left with options like 'Reports', 'Production', 'Batch Tracking', and 'Batch Cockpit'. The main content area includes a filter bar with 'Week: 2016-W38 (08/19/2016)', 'Process: D4 Filtration BBT', and 'Batch type: TT1 Production'. Below the filter, there are buttons for '+ Create', 'Edit', and 'Delete'. A table lists batch names, with '81161787.2' selected. To the right, a 'Batch Cockpit' panel shows 'Changes on batch', 'Changes on processes', 'Changes on values', and 'Changes on transfers'.

The bottom screenshot shows a detailed view of the selected batch '81161787.2'. It displays a table with columns for 'Batch name', 'Order number', 'Start time (Process)', 'Stop time (Process)', 'Start time (Block)', 'Stop time (Block)', 'The Date', 'Line', 'Batch type', 'Material', 'Supplier batch number', 'Approach material number', and 'Opening stock'. The 'Batch name' is '81161787.2', 'Order number' is '81161787', 'Start time (Process)' is '15:00:00 08/20', 'Stop time (Process)' is '16:15:00 08/20', 'Start time (Block)' is '23:00:00 08/20', 'Stop time (Block)' is '20:00:00 08/20', 'The Date' is '24/08/2016', 'Line' is '77200', 'Batch type' is 'TT1 Production', 'Material' is 'Filter address 2', 'Supplier batch number' is '[Mixed batch]', 'Approach material number' is '[Mixed batch]', and 'Opening stock' is '250.00 kg'.



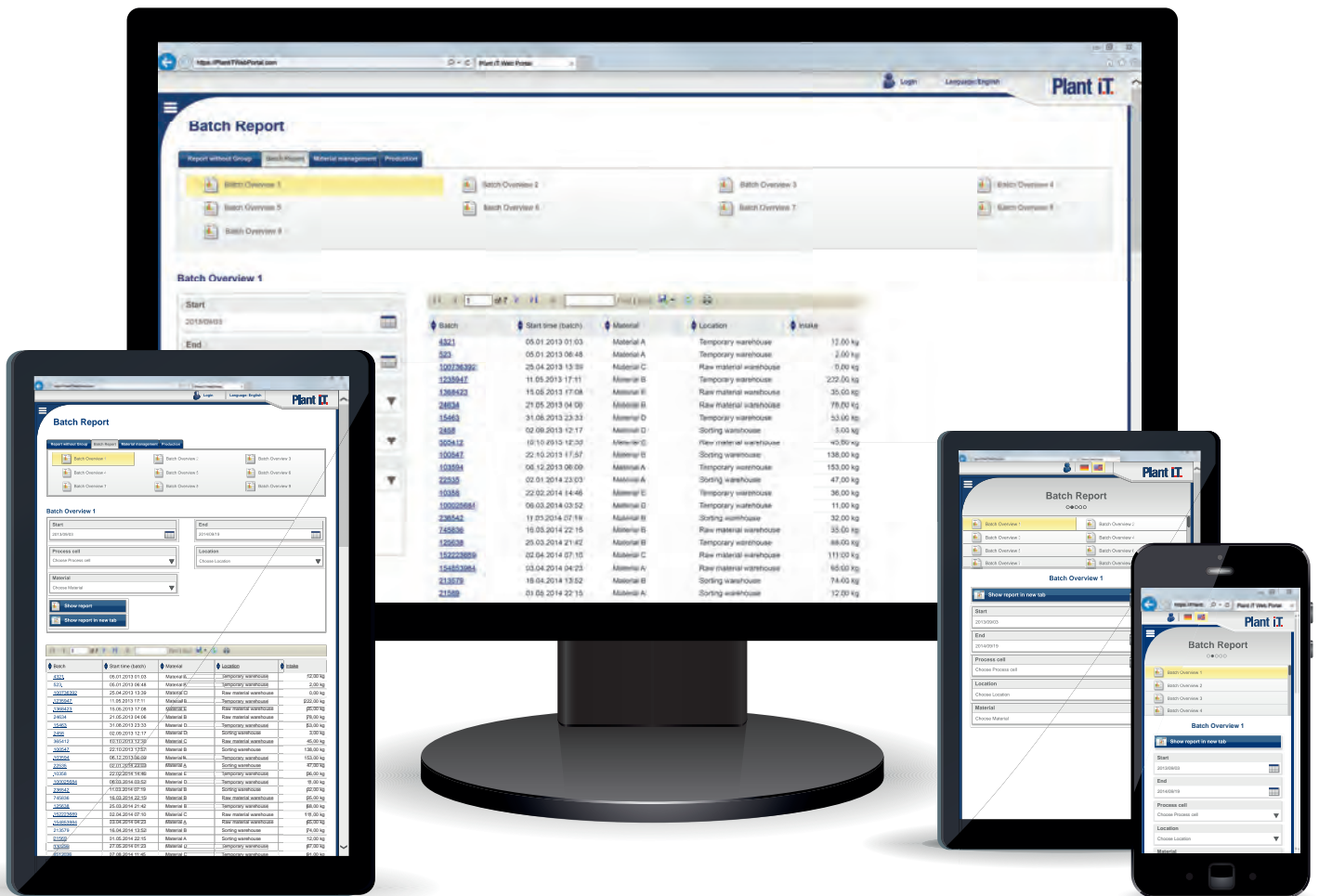
## Plant iT web portal Web Reporting and Applications

Websites opened via the web portal can be run on various internet browsers and retrieved from PCs and mobile devices. It is not necessary to install third-party software (Java, Silverlight, Flash, or similar) on the clients.

The web portal enables the retrieval of Plant iT reports from several production servers and the retrieval of reports of a Microsoft Reporting Services server.

Reports created via Microsoft Reporting Services, in particular, can process data from various sources (e.g. third-party databases, OLAP, web services).

All the reports from all the sources are displayed in the same user interface along with their parameters. The web portal remembers the most recent settings of key parameters (e.g. time period, plant, material) and pre-assigns



them for the next visit or the next report. This means repeating input values can thus be avoided or reduced.

The Plant iT user management is used in the server-related web application. Users therefore only need to be created centrally once. Rights management takes place in the central Plant iT Configuration Manager.

The web portal can be additionally extended by ASP.NET MVC modules. A template is provided for this purpose. External websites can also be integrated.

The Plant iT web portal module is already included with the basic systems Plant Direct iT, Plant Liqu iT, Plant Batch iT and Plant Integrate iT.



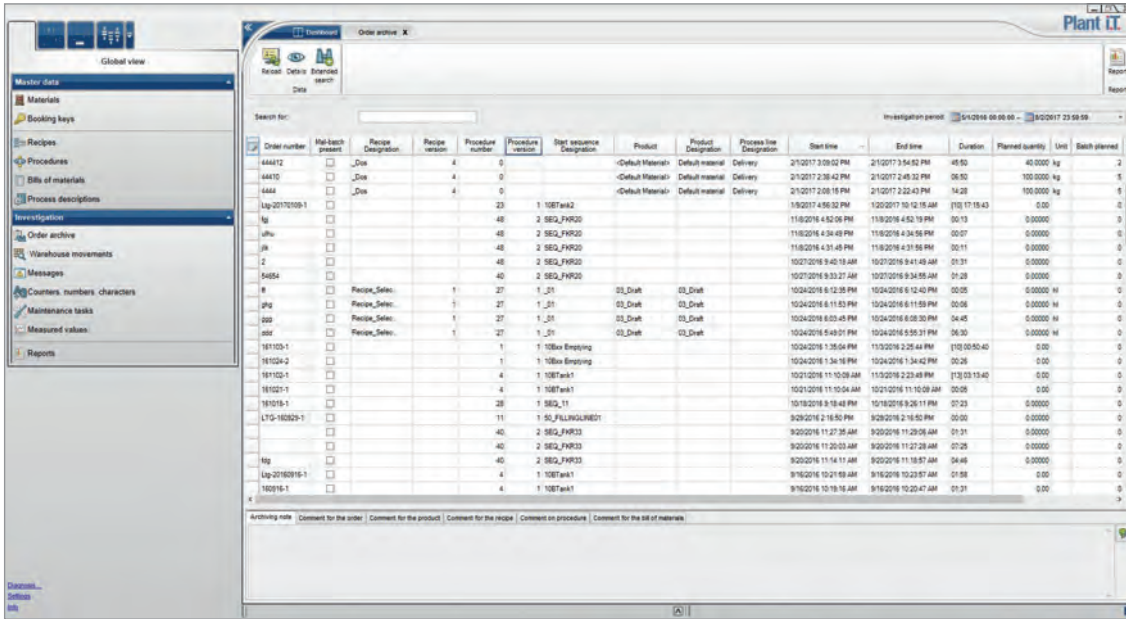
## Plant iT archive manager Long-term Archive Solution

Data and information are the key assets of any company. Keeping them readily available to meet respective customer requirements is an indispensable criterion. The Plant iT archive manager module offers a solution for archiving all transaction data recorded in the control system. The research requests are executed via existing Plant iT clients. Various filters (e.g. order number, recipe, receiving goods number) enable convenient search options according to de-

tailed information within the respective batch, including, for instance, recipe parameters, operator intervention or consumption levels.

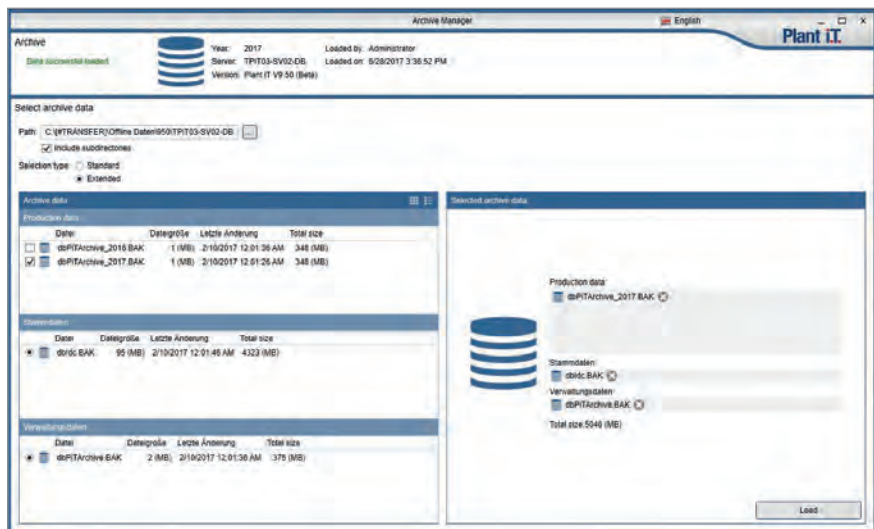
### **Efficient long-term archiving**

All the control system's transaction data is then available for research purposes for three years or more. Data can be transferred from the production server to the archiving system by simply copying the database backups.



Users can conveniently search for batches in the familiar system environment via various filters

The user-friendly design of the Plant iT archive manager enables the intuitive operation of the module and rapid access to data stored in the archive. Moreover, the streamlined software design is achieved without additional drivers, applications or other add-ons.



In the user interface of the Plant iT archive manager, it is possible to select and load the exact data-bases that are of interest for the user



## Plant i.T. material Process-oriented Materials Management

One of the key instruments for the effective management of order and recipe-controlled production processes is a process-related materials management with a transaction-accurate online view of all material transactions.

They are recorded on the basis of a process-compliant warehouse structure and in addition to precise inventory management also enable investigations and evaluations, in particular batch tracing.

The optionally available module Plant i.T. material provides this functionality and can be flexibly combined with all Plant i.T. components. Plant Batch i.T. is

an exception here. The module for materials management is already an integral part of the Plant Batch i.T. base system.

### Master data management

The relevant properties for storage locations, materials and warehouse transactions are parameterised in the system. Besides an extensive set of properties, Plant i.T. material considers the special requirements of the process industry when defining storage locations by differentiating various types:

- **Automatic storage location (storage unit):** Permanently connected to the plant, material transactions are controlled by an automation system (e. g. tanks, silos)
- **Manual storage location:** No physical connection to the plant, material transactions take place manually (e. g. forklift truck) or are controlled by an external system (e. g. automatic transport system)
- **Docking storage location:** Temporarily connected to the plant via automated docking equipment, material transactions are controlled by an automation system (e. g. containers, big bags)

Materials with an identical set of relevant properties are summarised in material classes (e. g. liquid raw materials, granulates, finished products) and described by parameterising these properties. The system differentiates between material parameters and batch parameters which enable the correct consideration of such material properties which may vary with each individual material batch (e. g. active agent concentration).

Warehouse transactions are initially classified according to booking types (e. g. inflow, outflow) and additionally rendered more precisely via transaction keys (e. g. goods receipt of silo goods, automatic dosing). Each recorded material transaction is assigned a booking type and a transaction key to enable precise selection for evaluations. The recording of material transactions usually takes place automatically, triggered by system-internal standard interfaces from the individual system components, but can also be executed manually via the Plant iT material user interface.

### Investigations and evaluations

Material and inventory overviews (warehouse status) are an important part of Plant iT material. For investigations, the transaction overviews (list of selected material transactions) and the booking archive are available. The flexible combination of the following selection criteria

- warehouse/storage location,
- material/material classes,
- time period,
- order/batch ID,
- goods receipt ID,
- supplier batch,
- booking type,
- transaction key or
- recipe and bill of material

turn these standard views into a very efficient tool. Details about each individual material transaction can be viewed online at any time and the use of special archiving mechanisms ensures quick response of the system even in case of large data volumes without the loss of detailed information. Depending on the storage location type, Plant iT material allows direct operator interventions from spontaneous stocktaking to triggering a docking or undocking process for a container.

### Batch tracing

The standard evaluations (inventory and transaction overview) provide direct access to the complete batch tracing function of Plant iT material. Starting at a freely selectable entry point in the storage model, investigations can be carried out in both directions. An overview divided into predecessors (upstream) and successors (downstream) with presentation of the information similar to the warehouse and transaction overview facilitates navigation.

With an order-related operating mode using Plant Batch iT or Plant Liqu iT, their batch or sequence records are interconnected with batch tracing. Plant iT material enables direct navigation to a batch record of Plant Batch iT or Plant Liqu iT and vice versa, ensuring that plant sections which cannot be defined as a storage location can still be included in the batch tracing.



## Plant iT connect Interface Manager

“Parameterisation instead of programming” is the central principle of the entire Plant iT system platform. Plant iT connect uses this principle to implement communication interfaces between a Plant iT system and external systems. Client/Server and host-based systems (e. g. ERP, LIMS or Maintenance) as well as intelligent measuring and analysis instruments, e. g. inspection systems and weighing systems, are supported. Plant iT connect provides a parameterisation frontend in the central engineering environment of Plant iT which can be used to completely plan an interface. To achieve this, the communication transactions and their contents are parameterised after the target sys-

tem-dependent selection of a suitable communication channel. For each of the interfaces implemented via Plant iT connect, the system offers a detailed online analysis function, which allows an extensive analysis of communication processes.

### Simple implementation of communication interfaces

The module Plant iT connect can be combined with any base Plant iT system and consists of an engineering interface, various communication channels and the system service. It is used for the implementation of communication interfaces for exchanging information between the process control system and various external systems. The range includes:

- Client/Server or host-based systems (e. g. ERP systems such as SAP, LIMS, maintenance systems)
- PC and PLC-based systems (e. g. automation systems and SCADA systems)
- Intelligent measuring and inspection systems (e. g. inspectors, inline analysis instruments)

### The engineering interface

The user interface of Plant iT connect is only required for parameterising and monitoring communication interfaces. It is seamlessly integrated into the Configuration Manager, the central engineering environment of Plant iT. With regard to the various available communication channels, the parameterisation dialogues have a uniform structure. They are automatically adapted to the special characteristics of the respective channel in terms of their content.

## Communication channels

The type of communication is specified for each interface to be parameterised by selecting a communication channel. Tasks of the communication channel include the interface-compliant preparation of the data to be transferred and the use of standardised functions for sending and receiving data packages. The parameterisation of data transfers is realized with standard Microsoft components (SSIS). The following communication channels are available:

### ■ SSIS Package

This package contains the communication channels BAPI, iDoc/RFC and RFC Client/Server

## The system service

The Plant iT connect service acts at the operating system level. Its primary task is to coordinate and log the communication transactions. Incoming data is prepared and forwarded to the correct communication channel. As the central instance, the service assumes key parts of data preparation. It therefore relieves the communication channels and enables a flexible extension of the system with additional types of communication.

## Typical application scenarios

iDoc and RFC communication are used, among others, for the data interface to the SAP modules MM, PP and PM:

### ■ SAP-MM interface

Depending on the requirement, a transaction-related, bi-directional data exchange on materials master data and individual material transactions takes place via this interface. It is also possible to periodically synchronise information on material inventories.

### ■ SAP-PP interface

Production orders including respective bills of materials are transferred from SAP to Plant iT via this interface, which in turn informs SAP about order-related data, e. g. order status and actual values, such as produced quantities.

### ■ SAP-PM interface

This interface is used to transfer counter values and measured values from the SAP module for planning and monitoring maintenance activities in the plant (e. g. current statuses of operating hours counters and operating cycle counters).

## brewmaxx

The industry solution for breweries



## brewmaxx

Process Control Systems. MES inside.  
The Plant iT™ industry solution for breweries.

We started with the development of our process control system brewmaxx in 1988. Today, our PLC-based control system is employed by breweries in the areas of automation, information and control technology. Processes can be continuously controlled and inspected with brewmaxx – from production data acquisition, process control technology and recipe-controlled liquid handling to functions for full production management (MES) across locations and the integration of ERP, LIMS and maintenance systems. As the foundation for all entrepreneurial decisions, it links the various processes intelligently and helps to manage a brewery more efficiently and economically.

brewmaxx is the Plant iT industry solution for breweries. brewmaxx is perfectly tailored to the day-to-day operations in breweries and enables innovative, user-oriented solutions like no other process

control system. We work where standardised control systems fail by focusing our attention on industry-specific process automation for breweries. Supported by our in-house system development and close cooperation with breweries, plant suppliers and universities, brewmaxx offers a cutting-edge process control system for the brewing industry.

The brewmaxx base system as well as all the modules and add-ons have a centralised engineering infrastructure with a common database and an integrated parameterisation interface. All the modules and add-ons can be combined with the base system. brewmaxx can therefore be flexibly adapted to the various process areas and production methods in breweries.



WARSTEINER

Operation room of Warsteiner – Complete automation of the brewery with brewmaxx

## brewmaxx – The automation solution for breweries

brewmaxx is an object-related and PLC-based process control system with MES functionality and integrated recipe control for liquids. It can be used in combination with PLCs from various manufacturers and is available in five language versions. This high level of flexibility is one of the reasons why brewmaxx is today used in breweries of all sizes, around the world, in more than 100 countries.

brewmaxx complies with the principle of “parameterisation instead of programming”. This means that individual programming is basically replaced by the parameterisation of technical and technological functions. The “compilerless” system architecture of brewmaxx allows maximum flexibility for alterations during operation. Alterations to the control system are even possible without stopping production. This time-saving benefit creates a significant competitive advantage – for us and our customers.

Engineering with brewmaxx takes place according to standardised methods. Standard functions, e.g. brewery-specific automation classes, ensure that the process control system is transparent. Alterations and extensions can thus always be traced and multiplied – a safe investment solution for the future

We developed brewmaxx specifically for the needs and requirements of the brewing industry. The result is an advanced, industry-specific system solution which combines extensive IT experience and brewery expertise in a single process control system.

brewmaxx supports the automation of complete breweries. So we can offer automation solutions for all process areas in a brewery:

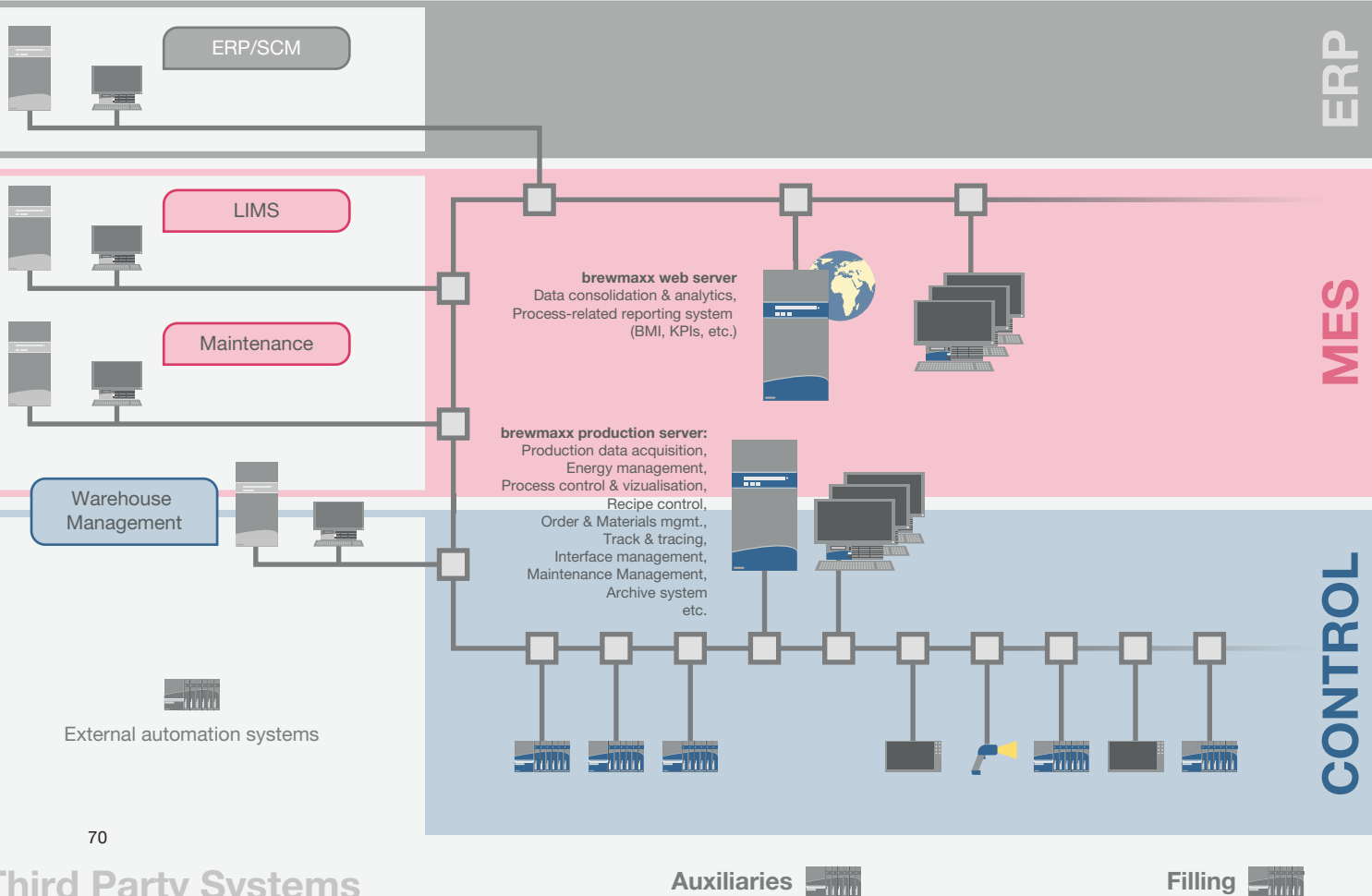
- Raw Materials
- Brewhouse
- Fermenting and storage cellars
- Yeast management/Yeast propagation
- Filtration
- Bright Beer Area/Beer Finings
- Bottling plants
- Auxiliary plants (CO<sub>2</sub> recovery, cooling plants, water treatment, wastewater plants)
- Energy data acquisition and load management





# brewmaxx

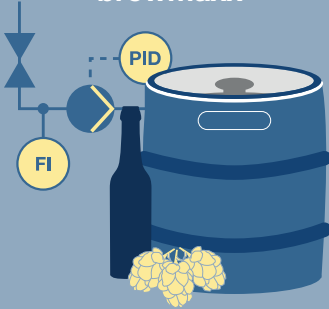

## System requirements



## System overview



 <b>brewmaxx connect</b> Interface Manager	 <b>brewmaxx material</b> Process-oriented Materials Management	 <b>brewmaxx archive manager</b> Long-term Archive Solution	 <b>brewmaxx web portal</b> Web Reporting and Applications
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 <b>brewmaxx</b> Process control system with recipe management	 <b>brewmaxx Integrate</b> MES, Reporting & Analytics		
<b>brewmaxx Messenger</b> Automatic Messaging Service	<b>brewmaxx Visu-Recorder</b> Process Events Recording	<b>brewmaxx Routing Management</b> Routing Management System	<b>brewmaxx Workflow</b> Workflow Management System
<b>brewmaxx EnMS</b> Energy Management System	<b>brewmaxx Equipment Modules</b> Equipment Modules	<b>brewmaxx LMS</b> Line Management System	<b>brewmaxx Batch Cockpit</b> Production Evaluation System
<b>brewmaxx Maintenance</b> Maintenance Management Solution			

The product family of brewmaxx consists two base systems: the process control system brewmaxx and the MES solution brewmaxx Integrate.

The process control system can be combined with the following modules:

- brewmaxx material – Process-oriented Materials Management
- brewmaxx connect – Interface Manager
- brewmaxx archive manager – Long-term Archive Solution
- brewmaxx web portal – Web Reporting and Applicationen

This is possible at the start of engineering or at a later date. The individual modules have been developed for typical fields of application and complement the base system with additional technological functions. Examples of this are process-related materials management or integrated interfaces for connection to external enterprise resource planning systems, e. g. SAP, Oracle, Microsoft, etc.

Some of the following brewmaxx add-ons have been developed especially for the brewing industry:

- brewmaxx Messenger
- brewmaxx EnMS
- brewmaxx Visu-Recorder

- brewmaxx Equipment Modules
- brewmaxx Routing Management
- brewmaxx LMS
- brewmaxx Maintenance

The following add-ons are available for brewmaxx Integrate:

- brewmaxx Batch Cockpit
- brewmaxx Workflow

# Base system



## brewmaxx Components of the base system

The basic version of the process control system brewmaxx offers system components for production data acquisition and evaluation and process control with recipe management.

### **Production data management**

brewmaxx is equipped with a high-performance real-time database in which all operating, process, machine and energy data is recorded, processed and provided. A number of pre-assembled production, batch and consumption reports are available as standard. The reports are generated in Excel and can be further processed quite easily. The brewmaxx production data manage-

ment system is identical to the base system Plant Acquis iT in terms of its functionality.

### **Process control system**

Due to its class concept (technical and technological automation objects with encapsulated functionality) the standard brewmaxx process control system offers proven solutions for control and process engineering tasks of the brewing industry. The class concept is identical to the base system Plant Direct iT in terms of its functionality.

### **Sequence-based recipe control**

Integrated in the standard process control system, brewmaxx provides system components especially developed for workflow-controlled processes in breweries. Furthermore, the technology-related recipe control contains the management and creation of master recipes as well as tank farm management and route control.

## The add-ons

The following brewing-specific add-ons can be combined with the brewmaxx process control system:

### ■ brewmaxx Messenger

The brewmaxx Messenger is a remote messaging system for notifying responsible staff of critical alarms. The add-on can be optionally installed for the existing base system if the technical infrastructure on-site supports the communication methods.

### ■ brewmaxx Visu-Recorder

The Visu-Recorder is a special feature of the brewmaxx process control system. Previous process sequences can be retroactively monitored via the standard user interface of the control system with the aid of the optionally available add-on. The output function is started directly via the brewmaxx process control panel – similar to a media player. The time window and output speed are freely selectable.

### ■ brewmaxx Routing Management

The optionally available brewmaxx Routing Management helps to integrate rule-based routing orders with a dynamic route search and allocation into order processing. With this add-on, a user program searches for a route to drain a tank. The user program creates an order with rule-based routing. Once the routing has automatically found a suitable target tank, the order is started automa-

tically and controls the sequence with the suitable recipe.

### ■ brewmaxx Equipment Modules

Equipment Modules encapsulate the technological functions of various brewing facilities. They control complex procedures, such as the entire raking procedure in a lauter tun. The option of transferring technological parameters from a higher-order procedure or linking parameters directly to equipment ensures the greatest possible flexibility and functional reliability.

### ■ brewmaxx EnMS

Use of the Energy Management System (EnMS) from brewmaxx enables the recording of all the as-is states of primary and secondary energy sources and other media. Energy monitoring provides detailed analyses in the form of standard reports. The EnMS supports the data transfer of energy values both from the brewmaxx server and from external servers and databases. The evaluation and analysis of this data can occur either at a workstation of the process control system or alternatively at an external office PC with the aid of an energy frontend. Brewery operators can therefore determine, document and constantly improve processes within their plants. brewmaxx EnMS is classified as a qualified Energy Management System to DIN EN ISO 50001.

### ■ brewmaxx LMS

The Line Management System from brewmaxx records plant and machinery downtime automatically. The causes of downtime and other system or order-related data can additionally be entered at any time manually via drop-down boxes. And predefined causes of faults can be enhanced and extended according to your individual needs. The threshold value for micro-faults can also be defined individually. Causes of faults are determined quickly and, in particular, consistently. Paper-based recording, which was always prone to errors, is now a thing of the past. Additional features provided by the add-on include an interface to existing ERP systems, and thanks to user-friendly operation via a web browser, the time-consuming and complex task of installing a client is no longer necessary.

### ■ brewmaxx Maintenance

Efficient maintenance planning is essential to ensure and maintain maximum plant availability. The add-on is a parameterizable solution for evaluating and planning all maintenance tasks. Individual automation objects, such as valves, motors and frequency inverters, and entire package units, such as compressors, packers or pasteurization units, can be clearly managed thanks to the intuitively designed solution.



## brewmaxx Useful modules for brewers

### **brewmaxx material – process-related materials management**

One of the key instruments for the effective management of order and recipe-controlled production processes is a process-related materials management with a transaction-accurate online view of all material transactions. They are recorded on the basis of a process-compliant warehouse structure and besides precise inventory management also enable investigation and evaluations, in particular batch traceability. The optionally available module brewmaxx material provides this functionality and can be flexibly combined with the brewmaxx process control system.

### **brewmaxx connect – parametrizable communication interfaces**

Parameterization instead of programming is the central principle of the entire brewmaxx system platform. brewmaxx connect uses this principle to implement communication interfaces between a brewmaxx system and external systems. Client/Server and host-based systems (e.g. ERP, LIMS or Maintenance) as well as intelligent measuring and analysis instruments, e.g. inspection systems and weighing systems, are supported. The optionally available module brewmaxx connect can be combined with any basic brewmaxx system.



# Base system



## brewmaxx Integrate MES, Reporting & Analytics

brewmaxx Integrate is a specially designed MES solution for the brewing industry and offers effective methods for the targeted management of production information. The allocation of data from subordinate systems (e.g. brewhouse, filter, cellar, filling) in the target database (MES) occurs via the staging area. With the help of an integrated configuration tool, data can be simply cleaned, transformed and loaded into the target database (MES). In the subordinate source systems, it is possible to parameterise which values should be transferred into the target database. The following four categories are available for selection:

- Physical model
- Material model
- Procedural model
- Booking model

### Specifications management

Specifications with up to four limit values can be allocated to the parameters from the subordinate systems. This enables the subsequent display of process deviations. Weaknesses can be detected, analysed and eliminated quickly and efficiently.

The values transferred from the brewmaxx database can be classified in the target system (MES database) in freely definable categories. This means, e.g. , various individual bookings from the production in the MES database can be allocated to a uniform booking class (e.g. for an ERP system) with fixed parameters. ERP systems do not usually have a detailed view of the brewery production processes. However, with brewmaxx Integrate they can be transferred to an ERP structure in a standardised fashion.

### The web portal

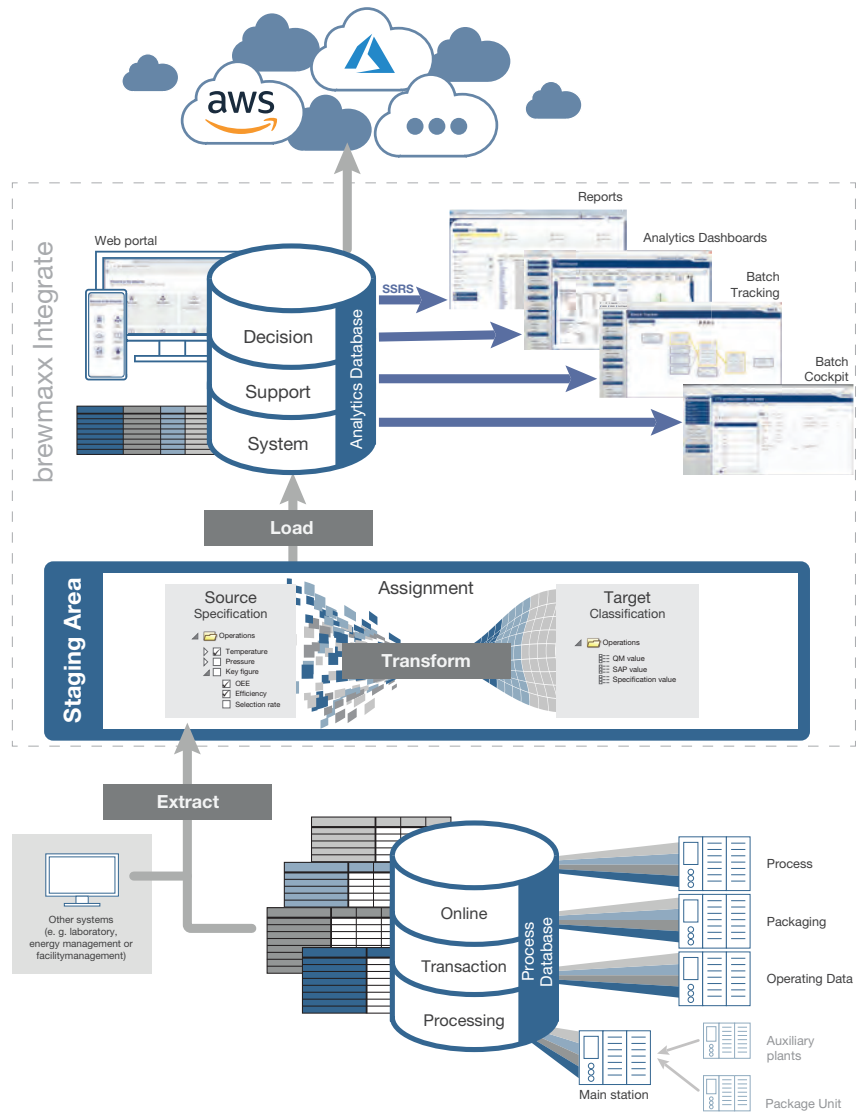
The brewmaxx Integrate web portal is the central platform that provides access to the prepared information from the subordinate systems. Subject to respective user rights, users can simply open production reports, e.g. , via an internet browser. Using hyperlinks, it is clearly displayed where the information comes from and how it is consequently structured (e.g. Brew report overviews ⇒ Brew report ⇒ Materials booking report).

### Analytics dashboards

The rapid evaluation of mass data and its clear graphic presentation occurs in brewmaxx Integrate with the help of the analytics dashboards. Large amounts of data can thus be evaluated and displayed within a matter of seconds. The intuitively structured user interface is optimised for various end devices (PCs, tablets, PDAs, etc.) and always enables ease of operation. The multiple selection technology developed by Qlik complies with current high usability standards. Diagrams can be altered dynamically, without changing the actual layout. Frequently applied settings or requests (e. g. in the form of filters) can be conveniently saved as a bookmark.

The analytics dashboards are an integral part of brewmaxx Integrate and come with pre-configured, brewery-specific layouts. Subsequent extensions and individual modifications can be carried out individually at any time and with little effort.

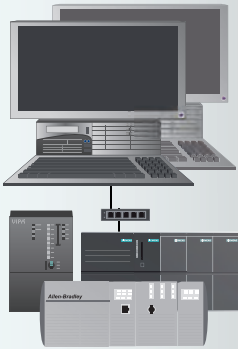
brewmaxx Integrate enables the rapid evaluation of mass data while focusing on the key information. Breweries equipped with brewmaxx Integrate can respond to problems rapidly before they become an issue.



brewmaxx Integrate – Integration of process data in the MES database via the staging area

# Base systems as a compact entry-level solution for small and medium sized plants

## Plant iT & brewmaxx compact Process control systems for compact units



### Components of Plant iT & brewmaxx compact

#### Software licences of:

MS SQL Server Express Edition, MS Windows, Plant iT compact or brewmaxx compact incl. Visu-Recorder

#### Workstation:

PC/Workstation incl. TFT

#### Supported controllers:

Siemens, Rockwell Automation

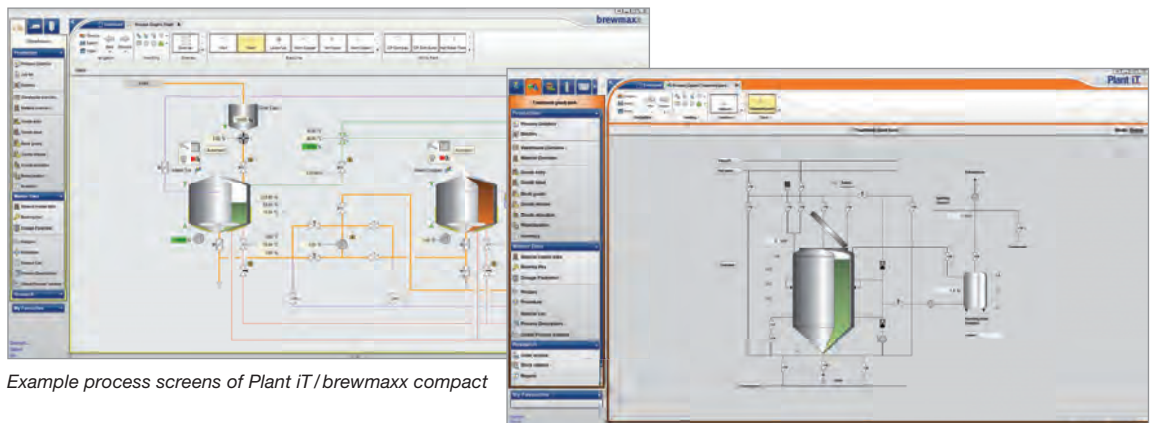
Our process control systems for the food, beverage and brewing industry are also available as a compact entry-level solution. Plant iT or brewmaxx compact consists of pre-configured automation classes, step sequences, order list and recipe management and is built to run with one programmable logic controller (PLC) and up to two workstations.

Manufacturers as well as machine and plant suppliers can utilise Plant iT or brewmaxx compact for applications ranging from production data acquisition (PDA) through to full process control. It is an optimized solution for smaller plant areas like CIP plants, pasteurizers or inline mixer.

### Benefits of Plant iT & brewmaxx compact:

- Minimal hardware requirements – serverless process control system
- Easy handling and operation – pre-configured Plant iT/brewmaxx process control system
- Integrated Ethernet extension\* – use of the onboard Ethernet interface of the PLC
- Minimal investment costs – for software and hardware
- Multi-language support – language packages for English, Spanish, German, French, Portuguese and Russian
- Scalability of Plant iT & brewmaxx – reusability of engineering makes expansion to full system easy
- License-free Visu-Recorder compact included – Recording and replay of process activities

\* for Siemens controllers only



Example process screens of Plant iT / brewmaxx compact

## Plant iT & brewmaxx express

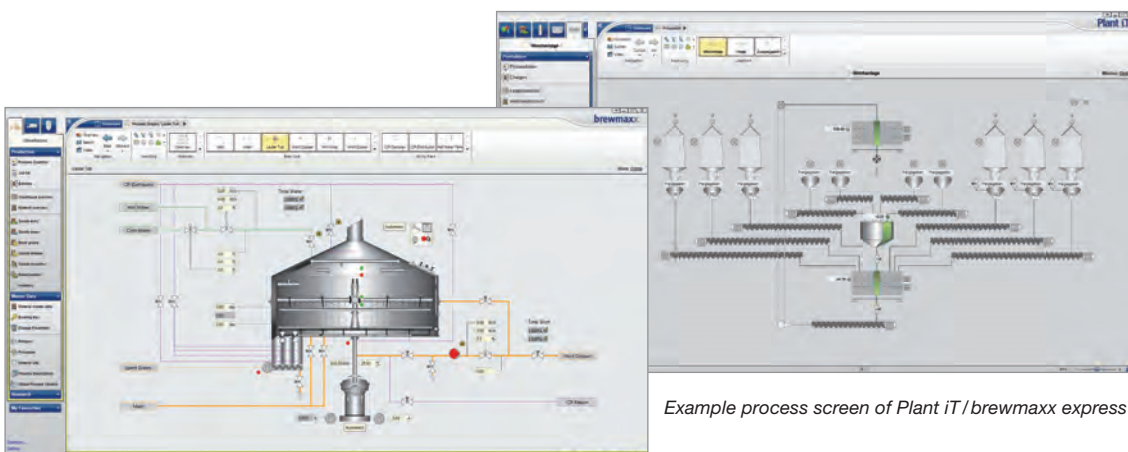
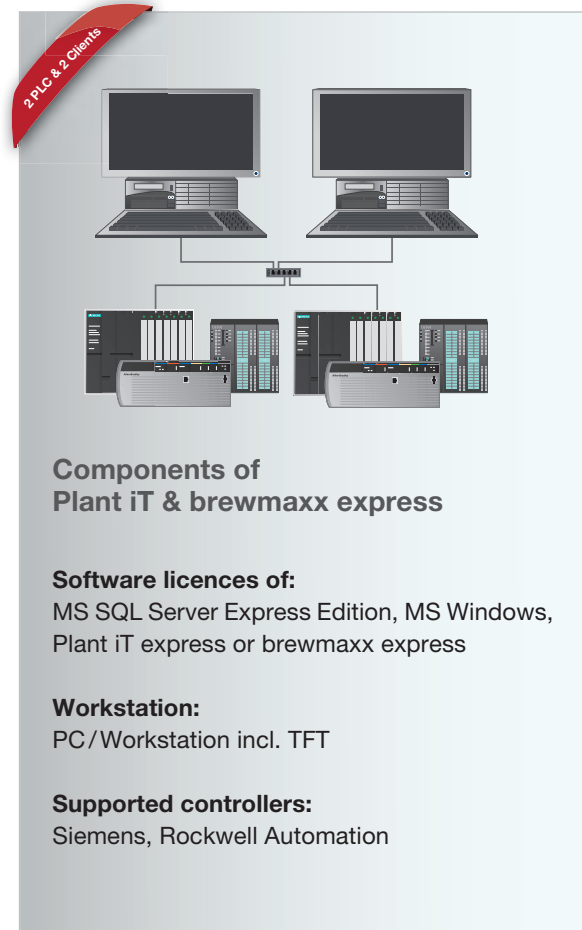
### Process control systems for small and medium-sized plants

Plant iT or brewmaxx express is an attractive solution for small and medium-sized plants. The Plant iT or brewmaxx express licence package consists of an extended number of pre-configured automation classes than the compact licence and is built to run with up to two programmable logic controller (PLC) and up to two workstations.

Manufacturers as well as machine and plant suppliers can utilise Plant iT or brewmaxx express for applications ranging from production data acquisition (PDA) through to full process control. It is an optimised solution for small up to mid-size plant areas like utilities, water treatment, filtration and CO<sub>2</sub> plant. brewmaxx express is also suitable for smaller brewhouses.

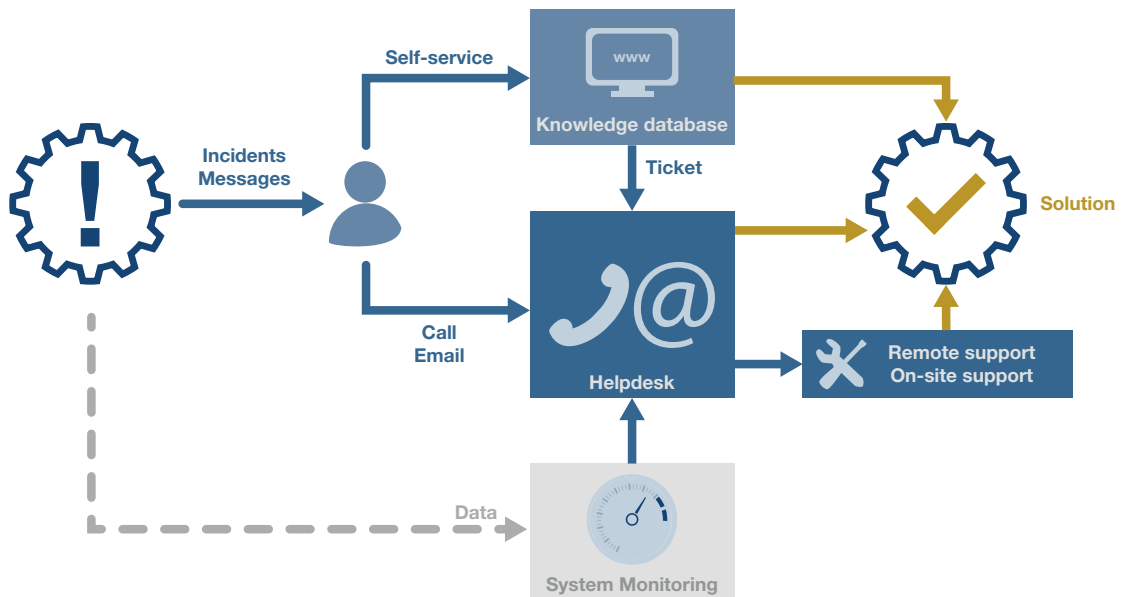
#### Benefits of Plant iT & brewmaxx express:

- Easy handling and operation – pre-configured Plant iT or brewmaxx process control system
- Two full clients and PLCs – for small up to mid-size plants
- Extensive automation classes – matches the scope of the Plant iT and brewmaxx full version
- Minimal hardware requirements – serverless process control system
- Multi-language support – for English, Spanish, German, French, Russian and Portuguese
- Scalability of Plant iT and brewmaxx – reusability of engineering makes expansion to full system easy
- Discounted licence fees for the Visu-Recorder express – recording and output of process visualizations



## Service & Support

### Competent and fast support



All service requests are sent to the ProLeiT help desk. Our service staff store your request which is subsequently processed at various support levels.

As the manufacturer of the process control systems Plant iT and brewmaxx and the MES solutions Plant Integrate iT & brewmaxx Integrate, we offer you quick and full post-commissioning support during the entire life cycle of your production plant.

Engineers with extensive project experience are at the core of our support team. When faced with a range of complex support requirements or technology problems, project and development teams are integrated into the problem-solving process in an appropriate manner. We can therefore respond to your request without delay and in a way that really suits you best.

### High level of system availability

Our portfolio provides you with active support for your Plant iT and brewmaxx system. Irrespective of whether your production plant runs 8/5 or 24/7, the continuity and improvement of your business processes is the main focus of our service deliveries. The application of proactive services, e.g. 24/7 system monitoring or regular manual maintenance, guarantee not only improved system availability, but also minimise the required effort in the event of malfunctioning.

### Automatic 24/7 monitoring

Thanks to our monitoring solution system, the system functions of your Plant iT and brewmaxx plant can be monitored 24/7. System monitoring immediately

detects IT infrastructure problems and any deviations from standard operating conditions. This means plant faults can be analysed faster and the causes of malfunctioning are easily identified and eliminated – act instead of react.

### Faster, more qualified support

The entire team, consisting of support specialists, project planners and developers, will deal with your requests in a consistent and professional manner during service hours (Monday to Friday between 9am and 5pm, CET); extended support can be arranged, if required.

## ProLeiT Academy

### Training directly from the manufacturer

The ProLeiT Academy offers our customers and partners an extensive range of standard training courses for the process control systems Plant iT and brewmaxx. The various contents of the training courses relate either to our process control systems or to typical user groups. The following training courses are currently offered throughout the year:

- **Product training courses:**

Open training, according to the training course calendar for customers and partners

- **User training courses:**

Individual training, scheduled and coordinated for customers and partners

In close cooperation with end customers, system integrators and plant and machine manufacturers, individual workshops, tailored to the project-specific working and development environments, are additionally offered. Plant Acquis iT courses for production data acquisition or energy management, as well as special programming courses for developing customer-specific automation classes are examples of this.

An overview of all standard product training courses can be found on our website via the following link:  
<https://www.proleit.de/training.html>

Our trainers are experienced members of staff who will provide you with valuable background information, techniques and tips and tricks to facilitate your daily work with our process control systems.

The courses are usually held at our headquarters in Herzogenaurach or at the premises of our subsidiaries. Additionally, we also offer individual workshops that are run by our trainers at a location of your choice.



## Selected references

Plant iT & brewmaxx – installed in more than 1,800 plants

- AB InBev (Group)
- Adelholzener Alpenquellen GmbH
- Adler-Werk Lackfabrik Johann Berghofer GmbH & Co KG
- Almarai Company Ltd.
- Ambev S.A. (Cebrasa Brewery)
- Asahi Beer K.K. (Group)
- Bad Dürrheimer Mineralbrunnen GmbH & Co. KG Heilbrunnen
- Baer (Lactalis Suisse SA)
- Baptista Bakery Inc.
- BASF Construction Polymers GmbH
- BASF Personal Care and Nutrition GmbH
- Bavaria N.V.
- Bayer HealthCare AG
- Beijing Yanjing Brewery Co. Ltd.
- Bell's Brewery Inc.
- Bertin Ltda.
- BK Giuliani GmbH
- Brillux GmbH & Co. KG
- Calidad Pascual S.A.U.
- Caramuru Alimentos S/A
- Carlsberg (Group)
- Chemson Ltd.
- Clariant Produkte GmbH
- Coca-Cola Erfrischungsgetränke AG
- Comanche Biocomustíveis de Canitar Ltda.
- Danone GmbH
- Danone-Unimilk
- Diageo (Group)
- DMK Deutsches Milchkontor GmbH
- East African Breweries Ltd.
- Eckes-Granini Deutschland GmbH
- Efes (Group)
- Ensinger Mineral-Heilquellen GmbH
- Enviral A.S.
- Esco - European salt company GmbH & Co. KG
- Feinkost GmbH
- Feldschlösschen Getränke AG
- Firestone Walker Brewing Co., Inc.
- Font Salem (Damm)
- Franken Brunnen GmbH & Co. KG
- Franz Kaldewei GmbH & Co. KG
- Fresenius Kabi AG
- FSB Backwaren GmbH
- Glockenbrot Bäckerei GmbH & Co. oHG
- Granol Indústria Comércio Exporação S/A
- Grolsche Bierbrouwerij Nederland B.V.
- Haka Kunz GmbH
- Hassia Mineralquellen GmbH & Co. KG
- Heineken (Group)
- Henkel Waschmittel GmbH
- Henkell Freixenet
- Heraeus Holding GmbH
- Israel Beer Breweries Ltd.
- J. Bauer GmbH & Co. KG
- Jowa AG
- Juhayna Food Industries S.A.E.
- Kaanlar Food Industry
- Kenana Sugar Company
- Kerry Ingredients GmbH
- Kiesel Bauchemie GmbH & Co. KG
- Knauf Gips KG
- KWS Saat SE
- Link Snacks Germany GmbH
- LyondellBasell Industries Basell Polyolefine GmbH
- Martin Bauer Holding GmbH & Co. KG
- Merck KGaA
- MillerCoors (Group)
- Molkerei Alois Müller GmbH & Co. KG
- Münzing Chemie GmbH
- Natural S.A.
- Naturella Getränke GmbH & Co. KG
- OMIRA Oberland-Milchverarbeitung Ravensburg GmbH
- Pfinder KG
- Privatbrauerei Erdinger Weißbräu Werner Brombach GmbH
- Privatbrauerei Fritz Egger GmbH & Co. KG
- Rehau AG & Co. KG
- Royal FrieslandCampina (Group)
- Sachsenmilch AG
- Schwenk Zement KG
- Sierra Nevada Brewing Co.
- Sigma Alimentos (Group)
- Silesia Gerhard Hanke GmbH & Co. KG
- Tara Milco Industries Ltd.
- Warsteiner Brauerei Haus Cramer KG
- Werner & Mertz GmbH
- Werner Brombach GmbH
- Wimm-Bill-Dann Foods (Group)
- Grupo Ybarra Alimentación S.L.



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### ProLeiT AG

Einsteinstr. 8  
91074 Herzogenaurach  
Germany

Phone: +49 9132 777 0  
Fax: +49 9132 777 150  
E-mail: [info@proleit.com](mailto:info@proleit.com)  
Internet: [www.proleit.com](http://www.proleit.com)

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