brewmaxx

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

We started with the development of our process control system brewmaxx over 30 years ago. Today, our PLC-based control system is utilised by over 850 breweries in the areas of automation, information and control technology. Processes can be continuously controlled and monitored 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.

Our process control system brewmaxx was specifically developed to meet the demands of the brewing industry and combines comprehensive IT expertise with brewing know-how. It is perfectly tailored to the day-to-day operations in breweries and enables innovative, user-oriented solutions. brewmaxx can be used for both full-scale or partial automation of a brewery, e.g. for silo systems, brewhouses, fermenting and storage cellars, yeast management systems, filtering systems, filling systems, auxiliary plants or CIP plants. Moreover, it is particularly suitable for migration and replacement projects. Implementation of a new brewmaxx system usually occurs in several stages with minimum system downtime or during breaks in production. Impressed by the increasing number of successfully completed projects in this sector, more and more breweries are choosing brewmaxx – the automation solution for breweries that combines experience, trust and efficiency in just one product.

Development based on principles
Unlike pure system integrators that usually use standardised control systems, we focus on industry-specific process automation. Due to our in-house system development, our brewing-specific know-how and our close cooperation with breweries, plant suppliers and universities, we are able to tailor each new version of brewmaxx even better to the requirements of our customers.

Value added with brewmaxx
Process automation with brewmaxx results in considerable savings in time, cost and effort. Resources are used more efficiently. The entire brewery becomes a flexible operation which can react quickly to new conditions and challenges. And last but not least, brewmaxx gives brewers the certainty of always being able to produce beer to the highest possible standards.

Integrated automation solution
brewmaxx provides master brewers and all other users with invaluable information about all production and business processes. As the foundation for all entrepreneurial decisions, it links the various processes intelligently and helps to manage a brewery more efficiently and economically.
The brewmaxx product family essentially consists of the brewmaxx process control system and the brewmaxx Integrate MES solution. The process control system can additionally be extended with the following modules:

- brewmaxx material – the process-oriented materials management
- brewmaxx connect – the interface manager
- brewmaxx archive manager – the long-term archive solution
- brewmaxx web portal – web reporting and applications

The web portal module is already included in the brewmaxx Integrate MES solution.

In addition, depending on the requirements and objectives of the respective brewery, the following add-ons are available, some of which have been specially developed for the brewing industry:

- brewmaxx Messenger
- brewmaxx EnMS
- brewmaxx Visu-Recorder
- brewmaxx Equipment Modules
- brewmaxx Routing Management
- brewmaxx Maintenance
- brewmaxx LMS
- brewmaxx Batch Cockpit
- brewmaxx Workflow
brewmaxx –
Process Control System with recipe management

The greatest advantage of brewmaxx is its modular system architecture. The modular system components can map all the process steps of a brewery and offer a seamless and integrated automation solution. The brewmaxx basic system as well as all the modules and add-ons have a centralized engineering infrastructure with a common database and logical user interface for intuitive parameterization. All the brewmaxx modules and add-ons can be retrofitted flexibly at any time.

Even the brewmaxx basic system offers an extensive range of services for the specific needs of breweries. Equipped with production data management with a high-performance real-time database, a brewery-specific recipe system for workflow-controlled processes and tank farm management with route control, the brewmaxx process control system is a future-proof solution for handling control and process engineering tasks. As option the following modules and add-ons are available:

**Module: brewmaxx connect – interface manager**
brewmaxx connect offers an interface with fully configurable parameters for universal data exchange, especially with external systems. Various standard communication channels (e.g. XML/B2MML) are available for linking ERP, laboratory or maintenance systems.

**Module: brewmaxx material – process-oriented materials management**
brewmaxx material enhances the management of order and recipe-controlled production processes through 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.

**Module: brewmaxx web portal – web reporting and applications**
The browser-based brewmaxx web portal allows users to simply call up reports via a PC, tablet and smartphone. It is not necessary to install third-party software, e.g. Java, Silverlight or Flash. The brewmaxx web portal enables the retrieval of standard production reports (e.g. batch or brew reports) from several production servers and the retrieval of MES reports. Further, the module features a Software Development Kit (SDK) for generating unique applications.

**Module: brewmaxx archive manager**
The brewmaxx archive manager module offers a solution for archiving all transaction data recorded in the control system. The research requests are executed via existing brewmaxx clients. Various filters (e.g. order number, recipe, receiving goods number) enable convenient search options according to detailed information within the respective batch, including, for instance, recipe parameters, operator intervention or consumption levels.

**Add-on: brewmaxx Routing Management**
The add-on extends the capabilities of the standard route control of the basic system. With this add-on it is possible to integrate rule-based routing orders with dynamic route search and allocation into order processing. Utilizing
so-called business rules, it automatically finds a suitable target tank, starts the order and controls the sequence with the corresponding recipe. The use of this add-on usually leads to an increase in plant utilization due to the increase in tank occupancy times.

Add-on: brewmaxx Workflow

brewmaxx Workflow is an efficient MES workflow management system that enables the management and monitoring of automatic and manual processes. Order processing, quality assurance (e.g. sampling) and the support of logistics processes are just a few examples. Also possible is the collection and provision of data which arises during production and in the production environment (e.g. in auxiliary plants). This data is used as the basis for production-relevant reporting and as a data source for superior 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, stocktaking)
- Production management (e.g. recipe/BOM management, production logistics)
- Quality management (e.g. management of specification values)
- Maintenance and servicing (e.g. operating hours counter, machine maintenance, operating cycle counter)

Add-on: brewmaxx Batch Cockpit – production evaluation system

The add-on brewmaxx Batch Cockpit from ProLeiT is a software solution for greater transparency and more effective plant utilization in the brewing industry. The add-on is designed for evaluating, processing and validating production data. It therefore facilitates efficient analysis of the large volumes of batch and process data generated during production proceedings. Process plant operators are provided with a precise overview of their production activities, meaning correlations are detected and potentials fully used. Since data sovereignty, in other words the ability to know which batch is produced when, how and where and at which level of quality, is the key to efficient production processes.

Add-on: brewmaxx Equipment Modules

These modules control complex procedures, such as the entire raking procedure in a lauter tun, automatically. 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.

Add-on: brewmaxx Messenger – automatic messaging service

This add-on sends messages directly from the control system to defined persons. The optional remote messaging system, including escalation management, supports various communication channels, such as emails and text messages.
Add-on: brewmaxx EnMS – energy management system
The qualified energy management system to DIN EN ISO 50001 can be integrated into the process control system at any time. With an appropriate infrastructure, energy consumption within the plant is determined and documented. EnMS therefore forms the basis for continuous process optimization.

Add-on: brewmaxx LMS – line management system
Through brewmaxx LMS, ProLeiT enables simple access into the world of line management. The add-on records the automated downtime of plants and machines. The causes of downtime and other system or order-related data can be entered at any time manually via drop-down boxes. The entire data can be analyzed 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.

Add-on: brewmaxx Maintenance
brewmaxx 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 parameterisation of maintenance, the graphical evaluation of the switching cycle and – in terms of predictive maintenance – the display of the expected next maintenance date.

Add-on: brewmaxx Visu-Recorder – process events recording
This add-on is a special brewmaxx feature. It records process sequences and outputs them via the standard user interface of the control system. The output function is started directly via the process visualization. Time windows and output speed are freely selectable. User interactions can also be displayed whenever required.

Operation Manager – the central user interface for process operations
New features of version 9
Usability and design in a perfect harmony

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

It has never been easier to create complex process images using 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 brewmaxx Integrate we have developed new stand-alone MES solution to run with or without our process control system. Production reports can be easily displayed and transferred via a web browser. 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.

Process screen of a brewery within the Operation Manager

Creation of a process screen with the integrated Process Screen Designer
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.

Curve viewer
The new curve viewer of the operation manager optimises the display of measurement curves while providing additional functions for research, commenting and comparing measured values. This means, for example, that ordering and batch comparisons from differing time periods can be quickly analysed and displayed.

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.

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 brewmaxx LMS, a new add-on is available for the process control system, which is used, for example, to acquire and analyse 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 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 brewmaxx clients.
New in Version 9
Stand-alone MES & Webportal

**Stand-alone MES solution**
brewmaxx Integrate is a new, stand-alone MES basic systems that can be used together with or without the brewmaxx process control system. 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.

**Web portal**
The brewmaxx web portal ensures the process control system brewmaxx has 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 contains a software development kit (SDK), which allows the integration of your own websites and third-party components.

**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. CIP) and provide a further key component for modular automation (MTP).
OPC UA server, Maintenance Management & Batch Cockpit

**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 optimised. 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**

brewmaxx 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 parameterisation of maintenance, the graphical evaluation of the switching cycle and – in terms of predictive maintenance – the display of the expected next maintenance date.

**Batch Cockpit**

As an option to the new MES solution, 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 analyses of production data and has an audit trail function for viewing the batch record.
**System overview**

- **Server**
  - Standard server systems
  - High availability server systems
  - Virtual server systems
  - MS Windows Server
  - MS SQL Server

- **Communication**
  - Ethernet
  - TCP/IP
  - OPC
  - S7 OP Protocol

- **PLC**
  - Siemens
  - Rockwell Automation

- **Client**
  - Standard PCs
  - Industry PCs
  - Microsoft Windows
  - Microsoft Office

**System requirements**

- **Server**
  - Network & protocols: Ethernet, TCP/IP, OPC, S7 OP Protocol

- **Client**
  - Standard PCs
  - Industry PCs
  - Microsoft Windows
  - Microsoft Office

**Third Party Systems**

- **Warehouse Management**
- **Maintenance**
- **Enterprise Resource Planning (ERP)**
- **Quality Management**
- **Brewmaxx production server**: Production data acquisition, Energy management, Recipe control, Order & Materials mgmt., Track & tracing, Interface management, Maintenance management, Archive system etc.
- **Brewmaxx web server**: Data consolidation & analytics, Process-related reporting system (BMI, KPIs, etc.)
- **Auxiliaries**
- **Filling**
- **Control**
- **External automation systems**
Add-on: brewmaxx Routing Management – intelligent source, target and route selection

The standard route control, already included in the basic system, can optionally be extended with the Routing Management add-on. This add-on offers automated source and target tank selection as well as a dynamic route search for material transfers. It is based on parameterized routes and uses configured routing rules for selection.

Routing Management provides operators with support for the efficient and reliable selection of routes. Moreover, the add-on guarantees a significant improvement in plant efficiency, since tanks are utilized optimally, for instance. The add-on also offers many advantages with regard to saving resources: Unnecessary cleaning processes can be avoided (e.g. when producing different types of beer) by using the correct routes.

Integrated in the standard user interface

Operation of the Routing Management occurs via the brewmaxx 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 added «Routing» tab displays the route matrix. Furthermore, with manually created routing orders, the source, target and route can be manually selected.

Comfortable 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 (so-called business rules) can be created for one rule-based routing order. The plant statuses of the storage and transfer units are evaluated and the material taken into account.

A routing rule defines how the routing process is to be processed and how the order is started in the Operation Manager. Orders can either be created and carried out manually on site or started automatically.

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 parameterization 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.
brewmaxx Integrate –
MES, reporting & analytics

brewmaxx Integrate is a brewery-specific MES solution and offers effective methods for the targeted management of production information. The assignment of data from subordinate systems (e.g. brewhouse, filter, cellar, bottling) to the target database (MES) is achieved via the staging area. With the help of an integrated configuration tool, data can be easily extracted, transformed and loaded (ETL process) into the target database (MES). In the subordinate source systems, it is possible to configure which values are to be transferred to the target database. Four categories are available for this:

– Physical model
– Material model
– Procedural model
– Booking model

Specification Management
Specifications with up to four limit values can be assigned to the parameters from the subordinate systems. This enables the subsequent presentation of process deviations. Weak points can thus be identified, analyzed and corrected in a timely fashion. The values transferred from the brewmaxx database can be classified into freely definable categories within the target system (MES database) for subsequent analysis. ERP systems do not usually have a technically detailed view of brewery production processes. brewmaxx Integrate, however, provides shift supervisors and plant and production managers with all the relevant data in a clear and detailed manner.

Web reporting
The web portal of brewmaxx Integrate is the central platform that provides access to the prepared information from the subordinate systems. Provided appropriate user rights are in place, users can easily access information via an internet browser, e.g. production reports. The web portal enables the retrieval of standard production reports (e.g. batch or brew reports) from several production servers and the retrieval of MES reports. Further, the module features a Software Development Kit (SDK) for generating unique applications.

Analytics dashboards
By using the dynamic analytics dashboards in brewmaxx Integrate, it is possible to process and prepare information from various sources at a central location before displaying it accurately on state-of-the-art end devices thanks to visual analytics.

The intuitive user interface can be used with a variety of end devices (PCs, tablets, cell phones, etc.) and is always easy to operate. Diagrams can be changed dynamically without changing the actual layout. Frequently used settings and queries (e.g. in the form of filters) can be conveniently saved as bookmarks.

The analytics dashboards are an integral part of brewmaxx Integrate and are delivered with pre-configured, brewery-specific layouts. Subsequent additions and individual adaptations are possible at any time and can be carried out independently with very little effort. Current additions include a production manager dashboard, a golden batch comparison and a KPI evaluation using heat maps.

With brewmaxx Integrate it is possible to quickly evaluate mass data and to focus on the essential information provided. Thanks to brewmaxx Integrate, breweries can detect and eliminate deviations within a very short space of time.
brewmaxx Integrate – Integration of process data in the MES database via the staging area
brewmaxx for craft breweries –
Recipe system with an unlimited number of recipes

Initiated by creative beer brewers in the USA, craft breweries worldwide now represent high-quality and individually produced beer specialities. In addition to the high product quality, craft brewers focus on the individual brewing process. As a result, the automation solutions for such breweries need to be designed accordingly. The continued growth of a successful craft beer brewery demands more scalable operations to ensure consistent quality and taste stability.

Improving production quality, increasing production output, reducing production times

brewmaxx is ideal for entry into the world of automation – always focusing on the best possible quality and the special, extraordinary variety of craft beers. Here, the clever recipe system supports a quick creation of new beers. This way any craft brewer can react even faster to market requirements with brewmaxx. The following points, in particular, promise key advantages in all brewing processes:

Scalability
The transparent and scalable licence model of brewmaxx enables the process control system to grow together with the craft brewery. It can be easily expanded at any time, thereby offering excellent investment protection.

Productivity
With a high-performance automation solution such as brewmaxx, all the brewing processes within a craft brewery can be optimized. This ensures more produced brews each day – while maintaining the same high product quality.

Flexibility
brewmaxx complies with the principle of “parameterization instead of programming”. Due to its unique class concept, just one software module with fully configurable parameters always controls and monitors all similar objects within the plant. Compared to conventional process control systems, this has an array of positive impacts, such as shorter commissioning times or more efficient procedures for extensions and migrations.

brewmaxx compact

brewmaxx compact is a cost-effective, fully-fledged entry-level solution for compact plants that can be flexibly extended at any time. It includes the licence-free use of the add-on Visu-Recorder compact and also offers the option of short-term archiving.

Brewers as well as plant and machine manufacturers can use brewmaxx compact for controlling processes or production data acquisition (PDA). The entry-level solution is ideal for typical production areas, such as small to medium-sized brewhouses or auxiliary plants, water treatment and filter systems and CO₂ plants.
The integrated brewmaxx recipe control and management not only allows craft brewers to modify and refine existing recipes, but also gives them creative leeway when it comes to creating new varieties.

**Transparency**

In a growing brewery, more tasks inevitably arise than staff can actually keep an eye on. The brewmaxx tracking and tracing functionality ensures complete documentation at all times. Plant operators can quickly and clearly trace the route of their beer and its ingredients along the entire production chain. Thanks to this full traceability, it is possible to see at a glance what was produced by whom, when and where.

**Openness**

As an independent company, we work together with all well-known plant manufacturers. brewmaxx was developed for programmable logic controllers of Siemens and Rockwell Automation and gives craft brewers the freedom to choose their preferred suppliers. Even in the event of a subsequent change of supplier, the projected performance is still maintained.

Thanks to brewmaxx, ProLeiT offers craft brewery operators a PLC-based, scalable automation solution that optimizes production processes, enables flexible recipe adaptations and reduces the time required to manage devices and processes. This ensures that craft brewers can concentrate on the essentials: Making well-rounded, tasty beers.

**brewmaxx express**

Through brewmaxx express, ProLeiT offers a compact entry-level solution for small to medium-sized plants that integrates not only pre-configured automation classes and recipe management but also many other functions, such as sequences and order lists. The brewmaxx express licence can be used for up to two operating stations (clients) and two controllers (PLCs).

End customers as well as plant and machine manufacturers can use brewmaxx express for controlling processes or production data acquisition (PDA). The compact solution is ideal for traditional production areas, such as CIP systems or small to medium-sized brewhouses.
Intuitive user interface and extended MES functionality

The Operation Manager is the central user interface for operators and is available not only for the standard brewmaxx process control system 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 in a brewery. The presentation of process areas and MES functions, editable menus and numerous new processing functions enables intuitive and effective utilization of the control system.

All the elements of the interactive main menu bar and from the slide-out side menu can be added to the dashboard via drag & drop. A dashboard can be created and saved individually for each user. The function for displaying process pictures on several monitors is particularly convenient. Process pictures can be moved from the Operation Manager to other monitors. The user interface of the Operation Manager has been optimized for use with multi-touch screens. This ensures simpler operation of the latest touch panels with multi-finger operation.

Processes in state-of-the-art breweries are becoming more and more flexible, and the demands placed on operating staff are increasing accordingly. ProLeiT combats this development through a particularly clear design of its systems that complies with all the latest usability standards: Improved icons guarantee intuitive operation of the user interface, while dynamic display techniques ensure only the really relevant functionalities and processes are displayed (depending on the respective user role and workstation). The process image viewer – a compact visualization tool – also allows the individual compilation and arrangement of the process images that are of interest to the respective workstation or user.

brewmaxx Integrate extends the MES functionality of the standard process control system. It is a MES report system which is separate to the productive server and compiles the historic data of a brewmaxx server and various third-party systems in an operational data store (ODS). It can be used as a central MES reporting system for breweries and enables the presentation of analyses and production reports, e.g. via web browser. Furthermore, brewmaxx Integrate can be extended with a workflow management system for production-relevant business processes. This database-aided system is usually used for managing and monitoring manual processes in the production environment.
Our process control systems are designed for the hardware platforms of global market leaders. Our modular construction system enables you to put together the ideal solution to meet your needs.

The new user interface has been developed to the latest standards and with the help of usability experts. This results in time savings and a high level of user acceptance. New operators become familiarized with procedures in a minimum amount of time.

Why waste your precious time programming applications when you can simply configure and parameterize our system.

brewmaxx is the product of over 30 years’ experience and expertise in the management of brewing processes. Born from the desire to develop a process control system, which meets the most modern of demands, the specific technical know-how of our systems developers was blended with the technological expertise of our own master brewers. In conjunction with intensive dialog with customers and universities, brewmaxx has developed into the preferred system solution worldwide. Today, brewmaxx is used around the world and controls breweries with an annual output of more than 300 million hectolitres – i.e. almost one fifth of global beer production.