Customer magazine of Bachmann electronic GmbH

bachmann.realtimes

04/2013

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MODERN, EFFICIENT – AND MOBILE

'M1 webMI pro' revolutionizes the world of visualization

ELECTRICITY FROM THE ZILLERTAL ALPS

Upgrading the control engineering in the most powerful pumped storage power plant in Austria

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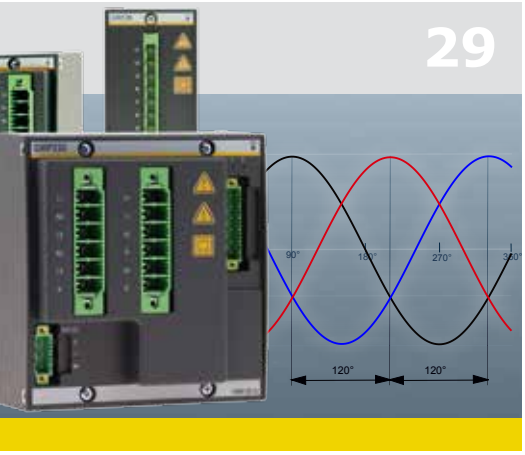


TOPIC

ENERGY MEASURING AND NETWORKING

ENERGY SUPPLY UNDER CONTROL
Bachmann grid measuring modules enable highly efficient energy monitoring.

APPLICATION

ELECTRICITY FROM THE ZILLERTAL ALPS
Rittmeyer AG uses Bachmann systems to upgrade the control engineering in the most powerful storage power plant in Austria.

PRODUCT & TECHNOLOGY

MODERN, EFFICIENT – AND MOBILE
With Bachmann's 'M1 webMI pro', each M1 controller is turned into the central server for fixed or mobile HMI devices.

NEWS

SUCCESS FACTOR: »PERSONAL SUPPORT«
Bachmann customers receive know-how and support first hand.

Dear Readers,

Energy is the central theme of this issue of realtimes. Whether for energy measuring, energy generation, energy monitoring or energy control in a challenging environment – the automation solutions of Bachmann keep energy efficiency in focus.

Good cooperation between people is another kind of energy that is no less important for our future. This determines how we work and shape the future together.
All the innovative solutions presented in this issue are after all the result of collective thinking and endeavor. I therefore wish to take this opportunity to thank all customers and employees for their fruitful and valuable collaboration.

Wishing you some energizing reading in every respect.

Yours sincerely,

Bernhard Zangerl
CEO

MODERN, EFFICIENT – AND MOBILE

‘M1 webMI pro’ from Bachmann electronic revolutionizes the world of visualization

The widespread global use of Internet-enabled devices has taken place at breathtaking speed. Their simple and intuitive operation is impressive. For the first time Internet and software applications are no longer stationary but can be used worldwide. These features are particularly important in the world of visualization: Mobile solutions for HMI, service or teleservice tasks enable cost savings and greater convenience. With 'M1 webMI pro', Bachmann electronic is offering a new product on the market that impressively demonstrates its technology leadership: Each M1 controller is turned into the central server for fixed or mobile HMI devices.

Today's visualization products are mostly based on permanently installed applications or on solutions that are only partly web-enabled and require the installation of plug-ins. Operator terminals at the machines are still being comprehensively implemented with fixed solutions. This presents a considerable difficulty for commissioning and maintenance in particular: It is often necessary to move constantly between the source of the mechanical error and the operator panel. However, this procedure has become a thing of the past thanks to the establishment of smartphones and tablets, as well as mobile Internet access.

THE CONSUMER IS THE TRENDSETTER

First-class operating concepts and attractive user interfaces have now become well-established in the consumer sector. However, these have not yet entered the field of machine visualization. Similar visualizations and useful functions such as infinitely variable zooming or the embedding of third-party content are difficult to implement in existing solutions. A comparison of the trends in the consumer sector with professional automation raises the question whether permanently installed HMI devices are really state-of-the-art. In many cases, mobile solutions would improve cost efficiency without incurring any losses in convenience.

CONFIGURATION AND MAINTENANCE – AN IMPORTANT COST FACTOR

As the complexity of machines and the number of requirements to be fulfilled increase, the effort required for engineering and maintenance naturally increases as well. Nowadays, it is not only necessary to allow for local visualization in the field, but also for the connection to a control station, a separate visualization for teleservice and sometimes also solutions for mobile terminal devices. Often each requirement here has to be implemented with separate applications. With many visualization products, the handling of different terminal devices and screen resolutions is also not possible.

Another restriction with traditional visualization solutions is the fact that any change or expansion of the application has to be delivered to and installed on all devices. This always requires the application to be shut down and the HMI device often has to be restarted. All these operations cost time and often involve problems that result in lengthy downtimes for operator terminals and frequently require the callout of a technician to the site.

PURE WEB VISUALIZATION FOR THE BACHMANN M1

Bachmann electronic is now launching a powerful product for pure web visualizations on the market called 'M1 webMI pro'. A slim-line web server that is directly installed on the M1 controller enables the connection of any visualization devices, such as smartphones but also powerful operator terminals. Provided the necessary authorizations are in place, the application can now be accessed from any point in the world.

The integration in the powerful controllers of Bachmann electronic shows the kind of performance that modern web technologies offer: A flicker-free display and hundreds

▼ **State-of-the-art visualization solution on an Apple iPad™:** Cockpit for monitoring a wind power plant in pure web technology.

» *A slim-line web server that is directly installed on the M1 controller enables the connection of any visualization devices, such as smartphones but also powerful operator terminals. Provided the necessary authorizations are in place, the application can now be accessed from any point in the world.*

Alexander Höss
Product manager at
Bachmann electronic

of animated graphic elements can be implemented, even with data refresh rates of well below 100 ms. The additional resources required here on the M1 controller are minimal.

The viewing of an 'M1 webMI pro' visualization page immediately demonstrates the extraordinary benefits of HTML5 and SVG (scalable vector graphics), the basis for all graphic objects. Perfect graphic results can be achieved without any losses in quality when scaling and zooming. 'M1 webMI pro' naturally also offers all the important functions of a leading visualization solution such as automatic alarming, the storing of trend values, trend analysis, user management and multi-lingual functionality. Special importance was placed here on simple project engineering and flexible application. Special requirements placed on the HMI or changes to the standard behavior of functions can be implemented using client-based Java scripts. There is virtually no limit to the possibilities available.

STATE-OF-THE-ART PROJECT ENGINEERING AND SIMPLE DELIVERY

The 'atvise builder' engineering tool is used for drawing process pictures, configuring animations and events as well as for other settings. A number of ready-made graphic objects and layouts, as well as the flexible reuse of pages using parameter transfers make it possible to create visualizations efficiently. Integrated editors even allow the drawing of

The web server on the Bachmann M1 forms the "visualization center", any clients can access it with a web browser, regardless of time and place.

new SVG graphic objects or the creation of additional functions with user-defined Java scripts. After the visualization is completed, it is simply transferred by FTP to the web server with a single click of the mouse. This makes the delivery of visualizations to large and distributed installations such as wind farms child's play. Time-consuming software installations to all HMI devices involved become completely unnecessary.

The latest version of the application is always shown as soon as a client connects with the central web server or reloads the web page. Special installations or a restart of the HMI devices are no longer necessary. All operator units are thus automatically brought up-to-date – without any interruption and irrespective of time and place. Geographically distant units and those that have been temporarily switched off, such as the maintenance PC, can be integrated without any problem.

INCREASED EFFICIENCY INCLUDED

The development of web technologies had to allow for the wide range of different terminal devices from the start, and different screen sizes and resolutions are a typical issue. The independence provided by 'M1 webMI pro' also simplifies the project engineering of a visualization since only a single application has to be created for all devices. If the visualization solution is also implemented directly on the controller, the configuration of the relevant data interfaces is also unnecessary: The variables can be accessed directly, an OPC server or any proprietary protocols become obsolete. Ultimately, this kind of web solution not only means efficiency in engineering but also a real increase in cost efficiency: The flexible access possibilities of mobile terminals or any PCs eliminate the need for many permanently installed devices, and user convenience is considerably increased. Special devices are no longer required.

THE FUTURE IS WEB-BASED

With 'M1 webMI pro' Bachmann electronic is using state-of-the-art and proven web technologies for the first time for visualizations. These stand out on account of the efficient programming, cost savings and increased convenience that they allow. Automation specialists are thus provided with a new tool with virtually unlimited possibilities.

EXPERTISE IN THE WIND

Intelligent automation solutions from Bachmann for wind power plants and energy parks

The installation of over 60,000 systems speaks for itself: Bachmann electronic is the leading company worldwide in the automation of wind power plants. Wind power plants with outputs from 700 kW to 7 MW are controlled with a Bachmann automation solution. Over 150 leading companies in the wind sector worldwide place their trust in the experience and technologies of Bachmann for maximum productivity and investment protection.

Bachmann provides holistic solutions for wind automation – tailored to the individual requirements of customers and users. The portfolio includes scalable solutions as well as configuration, parameterization and programming tools for the system. A competent engineering team supports plant builders, developers and operators, thus ensuring an economical market launch and market development.

SOFTWARE TOOLBOX FOR WIND POWER PLANTS
'WTE' – Wind Turbine Essentials – bundles Bachmann's many years of experience into a single software package. This supports manufacturers by considerably reducing the time required for developing and commissioning the controller software and the visualization. (Read more about this on page 10)

ENGINEERING MADE EASY
A new version of M-Target for Simulink® offers the user several helpful functions to make engineering easier and faster in the regular MATLAB/Simulink® engineering environment. The offline simulation options of the M1 controller, as well as online monitoring and debugging in the Simulink tool, thus make engineering even more efficient.

CMS – INTEGRATED OR STAND-ALONE
State-of-the-art condition monitoring systems (CMS) reduce malfunctions and downtimes in wind power plants and increase their productivity. Bachmann's 'Ω-Guard' system is available both as an integrated and as a stand-alone solution for condition monitoring. The direct integration of CMS in the controller of the WPP produces additional potential for synergy. This enables all states of a plant to be recorded and thus included in the data analysis. All components used and the online remote monitoring center are certified in accordance with the GL regulations.

SAFE, STANDARDS COMPLIANT AND STABLE POWER GENERATION
The GMP232 grid measurement and protection module from Bachmann integrates the necessary protection and monitoring functions into the conventional controller tasks. In compliance with the grid codes, it offers grid and generator protection in one and thus ensures the stability and availability of the electricity supply.

STATE-OF-THE-ART SAFETY ENGINEERING
'Safety Control' from Bachmann is a safety concept that is seamlessly integrated in the automation system. It meets the requirements of the latest directives and standards. Operational control, safety engineering and operator terminals are perfectly matched and allow open communication. The fastest possible response times, intuitive operation and comprehensive diagnostic options guarantee the highest possible level of safety.

RELIABLY MEASURING TOWER VIBRATION
Bachmann's SVM300 structural vibration monitor enables loads in the mechanical structure of a plant to be measured and recorded (e.g. tower, foundation). This enables the lifespan models of a wind power plant, for example, to be verified more accurately. The SVM300 has a modular design and can be expanded for a wide range of monitoring applications. This therefore enables the efficiency of the plant and its lifespan to be increased.

COMMUNICATION IN REAL TIME
The 'bluecom' protocol, specially developed by Bachmann electronic for smart energy grids, allows the fast, efficient and reliable networking of your wind power plants via Ethernet. The latest configurable energy protocols, such as IEC61850 and IEC61400-25, are available and thus simplify the communication and networking of plants. The fact that all further industrial fieldbus networking options are available to you goes without saying.

WEB-BASED SCADA AND VISUALIZATION
The 'atvise scada' from Bachmann offers a monitoring and control solution in the latest pure web technology. (Read more about this on page 16)

SUSTAINABLE SUCCESS
The wind power plants that are already reliably controlled today with Bachmann solutions generate a total output of over 90,000 MW. They provide electricity for over 50 million households around the world.

Bachmann automation solutions make it possible to use renewable energies economically and efficiently.

DEVELOPMENT TOOL WITH ADDED VALUE

Wind Turbine Essentials (WTE) offers maximum flexibility and comprehensive logging

WTE
Windturbine
Essentials

If companies are to survive in the environment of day-to-day competition, they must be able to flexibly implement innovative ideas into marketable products. However, for quality in development and manufacturing to be consistent, defined procedures and the reuse of tried and tested concepts usually have to be observed. As a result, flexibility can often be restricted. Bachmann has solved this dilemma with the Wind Turbine Essentials (WTE) development platform for developing software for wind turbines.

By incorporating the views of experts, Bachmann has been able to identify recurring and largely standardized processes in the development of control systems for wind turbines. These have been bundled into WTE to create a tool that retains the openness of the M1 system on the one hand, whilst offering standard functions as ergonomically designed tools on the other.

FLEXIBILITY THANKS TO A SPECIAL EVENT MANAGEMENT SYSTEM

Having a system of defined operating states (events or status codes) as a central element of the controller program has been a tried and tested practice of all manufacturers for many years. WTE therefore offers an event management system that can be flexibly configured for specific manufacturers. This has been implemented as a well thought-out set consisting of table editors in the configurator, a syntax with an immediate plausibility check and the associated modules and parsers in the controller. In this way it is possible to process events with a high level of efficiency, with configuration and programming clearly separated. WTE thus offers the user complete freedom in the design of the plant, the selection of responses to particular events and in terms of diagnostic options.

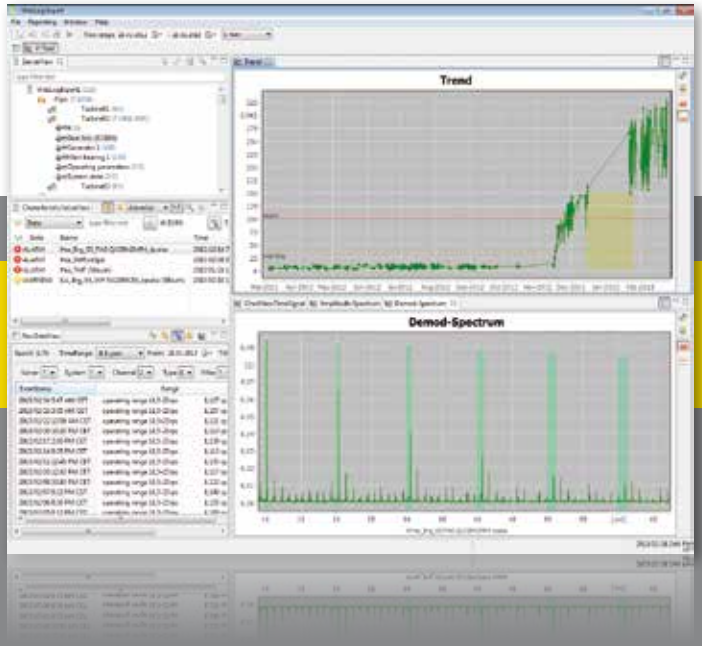
INTELLIGENT LOGGING

Every manufacturer is obliged to verify the generated power output of the wind power plant. This data must be assigned to daily, annual and overall values. With WTE, these values can not only be read online as variables but also logged automatically in data series. External evaluations are therefore also possible without any difficulty. Operating hours and switch operations can also be logged, which can be used both for maintenance and also for optimizing the plants. The configuration in WTE allows any values to be selected for long-term logging. These are available online as well as in the form of exportable data series.

FURTHER DEVELOPMENT – NOT A PROBLEM

Modifications and extensions in the turbine project can be carried out without any problem: They only require a configuration change to the WTE module whilst the source code remains unchanged. The version history of the configuration project simplifies the long-term maintenance and upkeep of a turbine generation for its entire lifespan. ■

From the toolbox to the plant: Bachmann Wind Turbine Essentials provides the most important standard functions – already programmed.



BY EXPERTS FOR EXPERTS

'WebLog Expert' as a new solution for teleservice

CMS
Condition Monitoring System

The successful 'WebLog' Internet portal from Bachmann Monitoring is used for monitoring the state of machines and plants with condition monitoring systems. With 'WebLog Expert', the company is presenting a new expert solution: A new operating concept for the different function areas enables more efficient configuration, parameter setting, commissioning and analysis.

'WebLog Expert' offers an optimized user interface that allows the intuitive operation of the program. The technology and appearance of the product were based on Bachmann electronic's tried and tested SolutionCenter.

SOLUTION FOR WIND PARK EXPERTS

The machine comparison was integrated as a new feature. This makes it possible to compare the measured data of different components – also beyond the limits of wind parks and servers. This considerably increases the meaningfulness and quality of the analysis. The enhanced visualization simplifies the display of measured data and trend curves. The wide selection of different layouts enables results to be compared and evaluated more easily.

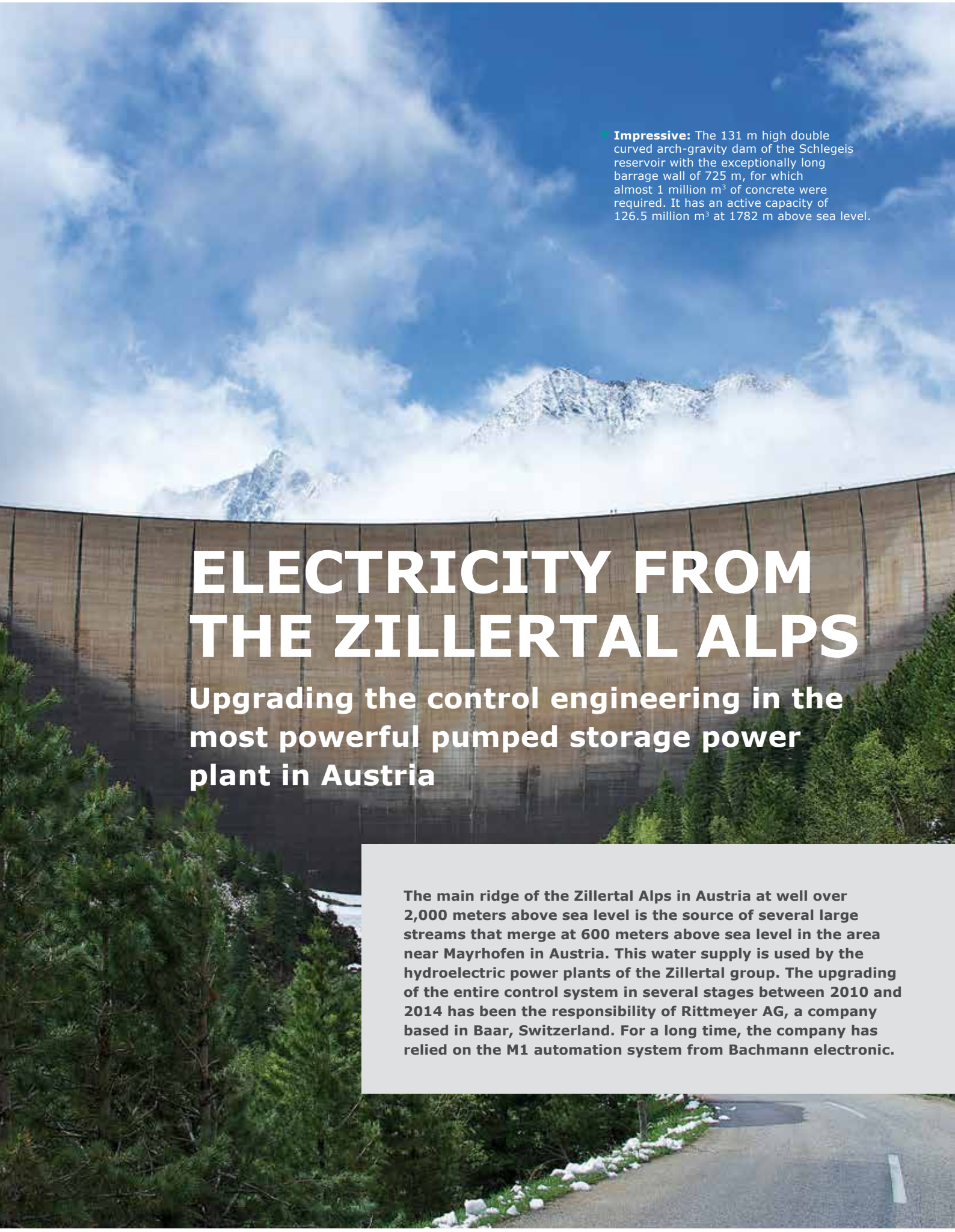
EFFICIENT CONFIGURATION

'WebLog Expert' allows a template-based configuration. This means that machines with the same components can be parameterized with just a single configuration. This is a major benefit, particularly for wind farms with a large number of identical wind power plants. Other process parameters from the Bachmann controller can also be incorporated in the configuration for evaluation purposes. This further improves the meaningfulness of analysis results.

TAILORED SOLUTION

Besides the new reporting tool which, for example, can create an overview of different diagnostic reports, 'WebLog Expert' also features a new Online Help. This allows users to work independently on the complex subject of condition monitoring in conjunction with the software solution.

Individuality is a key aspect of the 'WebLog Expert'. The user can not only customize the different perspectives but also show the different measuring data as required through the use of user-defined filters or categories. ■



▼ **Impressive:** The 131 m high double curved arch-gravity dam of the Schlegeis reservoir with the exceptionally long barrage wall of 725 m, for which almost 1 million m^3 of concrete were required. It has an active capacity of 126.5 million m^3 at 1782 m above sea level.

ELECTRICITY FROM THE ZILLERTAL ALPS

Upgrading the control engineering in the most powerful pumped storage power plant in Austria

The main ridge of the Zillertal Alps in Austria at well over 2,000 meters above sea level is the source of several large streams that merge at 600 meters above sea level in the area near Mayrhofen in Austria. This water supply is used by the hydroelectric power plants of the Zillertal group. The upgrading of the entire control system in several stages between 2010 and 2014 has been the responsibility of Rittmeyer AG, a company based in Baar, Switzerland. For a long time, the company has relied on the M1 automation system from Bachmann electronic.

» *We really value the extra-ordinary robustness and quality of the M1 system.*

Stephan Fabel

Vice President Hydropower at Rittmeyer AG

The Roßhag and Mayrhofen power stations were built between 1965 and 1971, and were extended in 1976. The Häusling power plant was built between 1974 and 1987. Together they form the most powerful group of storage power plants in Austria with a total output of almost one gigawatt.

COMPLETE UPGRADE AFTER THIRTY YEARS

An upgrade of the entire control system was required in order to ensure the continued safe operation of these power plants. Rittmeyer AG was awarded the contract for this extensive modernization project, which was planned in several expansion stages over five years. This involved the replacing of the process control system for all twelve main machine units: Six double Pelton turbines in the Mayrhofen power plant, four Francis turbines with radial pumps in the Roßhag power plant and two in Häusling. The machine unit control system with a startup and shutdown sequence, control of auxiliary units, as well as mechanical and thermal protection was entirely based on the M1 automation system. The process stations for the general systems, such as cooling water, onsite consumption and switchboards, as well as the auxiliary and secondary systems, were also renewed.

EXTENSIVE END-TO-END NETWORKING

"Over 50 networked M1 controllers and more than 30 remote substations connected via fiber optic cable were used," Stephan Fabel, head of the hydropower division at Rittmeyer AG, describes the enormous magnitude of the installation in a single sentence. The process stations and the local operator panels are connected via a process bus in a ring topology. Inside the power plants this is implemented as a fiber optic Ethernet network with an IEC 60870-5-104 communication protocol.

SECURE TRANSMISSIONS OVER LARGE DISTANCES

"The integration of the high-speed FASTBUS in the M1 automation system is a major benefit for this solution as well as for most of our complete solutions," Stephan Fabel highlights one detail. "This makes it easy to integrate remote input/output units in the control system over long distances via multimode fiber optic cables and without any loss in performance." This kind of requirement was needed, for example, at the Häusling power plant: It was

rittmeyer
BRUGG

Rittmeyer AG was founded in 1904 and is a company belonging to the Brugg Group. Headquartered in Baar, Switzerland, Rittmeyer develops and supplies turnkey measuring and control solutions for hydroelectric power plants, water and energy supply systems and waste water treatment plants. With around 300 employees, the company achieved a turnover of 67 million CHF (approx. 56 million euros) in 2012.


ELIN
ELIN
ELIN

◀ **All in line:** In the Mayrhofen power station, the water falls from the Stillup storage reservoir from an average height of 469.7 m onto six double Pelton turbines with an output of 57.5 MW each.

▲ **User-friendly optimization:** The operator panel close to the machine enables the operating personnel to adjust parameters to operating requirements at any time.

» *The integration of the fiber optic FASTBUS is unique.*

built into the steep rock face with a maximum height of almost 64 m. The installation in the power house consists of two machine units, each made up of a generator, a Francis turbine as well a two-stage single-flow pump and a hydraulic converter – interconnected by means of a vertical shaft over a total height of 40 m. "Thanks to the FASTBUS, we were able to implement a completely reliable connection over these distances," as Stephan Fabel confirmed.

The control and monitoring of the 220 kV outdoor switching station at the Mayrhofen power plant are also integrated in the control system. The field control devices are interconnected via a proprietary process bus to IEC 61850, and connected with the control system of the power plant and also the Mayrhofen central control room via an IEC 60870-5-104 protocol.

SEAMLESS SOLUTION GUARANTEES SAFE OPERATION

The higher-level Rittmeyer RITOP process control system enables the local visualization and operation of the three power plants. As well as the local operation at the machine unit panels, all systems within the RITOP process control system can be operated with the appropriate authorizations from a stationary workstation in the respective power plant control room.

The seamless software solution, with graphical user interfaces clearly designed by Rittmeyer for the specific installation, guarantees safe and intuitive operation of the plant. "Any changes in the plant are indicated on screen to the operator immediately," Stephan Fabel explains and adds: "Dynamic displays, made up of symbols, graphics and texts guide the operator reliably through the process." As the power plants are no longer manned with operating personnel round the clock, the plants were also redundantly connected to a higher-level control system: "The power plants are fully automated and are monitored and remotely controlled by the central control station in Mayrhofen," Stephan Fabel explains.

HIERARCHICAL OPERATING SYSTEM

The plant controls are divided up into four operating levels: Locally at the units, at the machine unit panel, in the respective power plant control room, and from the central control station in Zillertal, via the higher-level control system. "Operator authorization increases the closer the operator is to the process," Stephan Fabel explains. All operating data is also recorded and logged, together with all operating steps. The process stations and the process control system are synchronized to a standard system time via GPS.

SAFE INTO THE FUTURE

The large Schlegeis and Zillergründl reservoirs, both situated at almost 2,000 m above sea level have an incredible 220 million cubic meters of active capacity. The Zillertal hydroelectric power plants have an annual output of around 1,250 million kWh of electricity from natural inflows – controlled by reliable and future-proof Rittmeyer systems, with the Bachmann M1 automation system at its core. ■

OPERATING AND MONITORING – IN REAL-TIME

Special wind tools for the SCADA system

Real-time operation and monitoring are increasingly becoming key objectives in the ongoing operation of wind power plants and wind farms: This is a task which is conventionally implemented with SCADA systems. The perfect matching of the controller components of Bachmann electronic with the company's 'atvise® scada' in particular has produced a highly efficient tool. The adaption of the standard SCADA to the special requirements of the wind sector has enabled the company to make another important step. Interview with Ronald Düker, responsible for product marketing at Certec, the Bachmann subsidiary.

realtimes: *Bachmann electronic is planning to publish a SCADA system that is specially tailored to the requirements of the wind power sector. Can't the tasks involved in the operational management of a wind power plant or a wind farm be implemented with a standard SCADA?*
Ronald Düker: The requirements placed on a SCADA system in a wind power application are varied: In order to complete their tasks, manufacturers, service companies, operators and investors work with individual applications and have different needs in terms of data. All this has to be taken into consideration. It therefore makes perfect sense to provide a "toolbox" specially for the requirements of the wind power sector.

Naturally, it is already possible to adapt 'atvise® scada' accordingly and use it today. However, Bachmann always takes a customer-oriented approach and will therefore offer a perfectly tailored complete package in future. In discussions with customers, we were thus able to evaluate the requirements of a SCADA system for the wind power market. In the process it became clear that the operation and monitoring of wind farms and wind power plants are currently in a state of change. There is a need for increased profitability and to meet grid-specific and regulatory requirements at the same time. Operation and monitoring in real-time is increasingly becoming here a key priority. A large number of wind farm operators are already looking for a professional SCADA solution that meets these requirements precisely and want to invest in this area in the next one to two years.

realtimes: *What specific steps has Bachmann already taken in this area?*
Ronald Düker: A new visualization software for Bachmann controllers – 'M1 webMI pro' – has already been developed (more about this on page 4). It is based on the same visualization platform as the 'atvise® scada'. This therefore produces synergies between local and higher-level HMI of the SCADA system which offer major benefits in the implementation of the visualization as well as in operation. The systems also work together excellently with regard to the engineering: the object-oriented structure of 'atvise® scada' professionally supports the handling of types and objects based the IEC 61400-25 standard, which can be transferred directly from the Bachmann controller. This considerably simplifies the parameterization of the SCADA system. We are also currently working on the integration and display of condition monitoring information in 'atvise® scada' in order to further close the circle of central applications.

» *The complete SCADA package for wind power is impressive.*

realtimes: *What does the complete solution look like?*
Ronald Düker: Bachmann is able to offer a multi-level solution specially for the wind power sector: The company offers an impressive performance package, starting from a local controller visualization for the wind turbine, to the monitoring and operation of a wind farm, right through to a multi-farm SCADA. If required, experienced technicians and graphic designers can offer support for customized adaptions and future expansions. Incidentally, a first demo installation at the HUSUM wind power fair and at the EWEA in Vienna attracted a great deal of interest. This considerably confirmed our efforts. As market leaders in the wind power sector, we feel obliged to explore more innovative approaches. ■

DISCOVERING A NEW WORLD WITH GESTURES

Multi-touch now suitable for industry

The moving of virtual objects on screens with gesture control has produced a "more natural interaction" with the user interface.

Ronald Düker, responsible for product marketing at Certec, the Bachmann subsidiary

Tablets and smartphones are conquering the world – and with them intuitive operation via the screen. Industry is now also discovering multi-touch for itself. A talk with Ronald Düker about the future of this technology in industry.

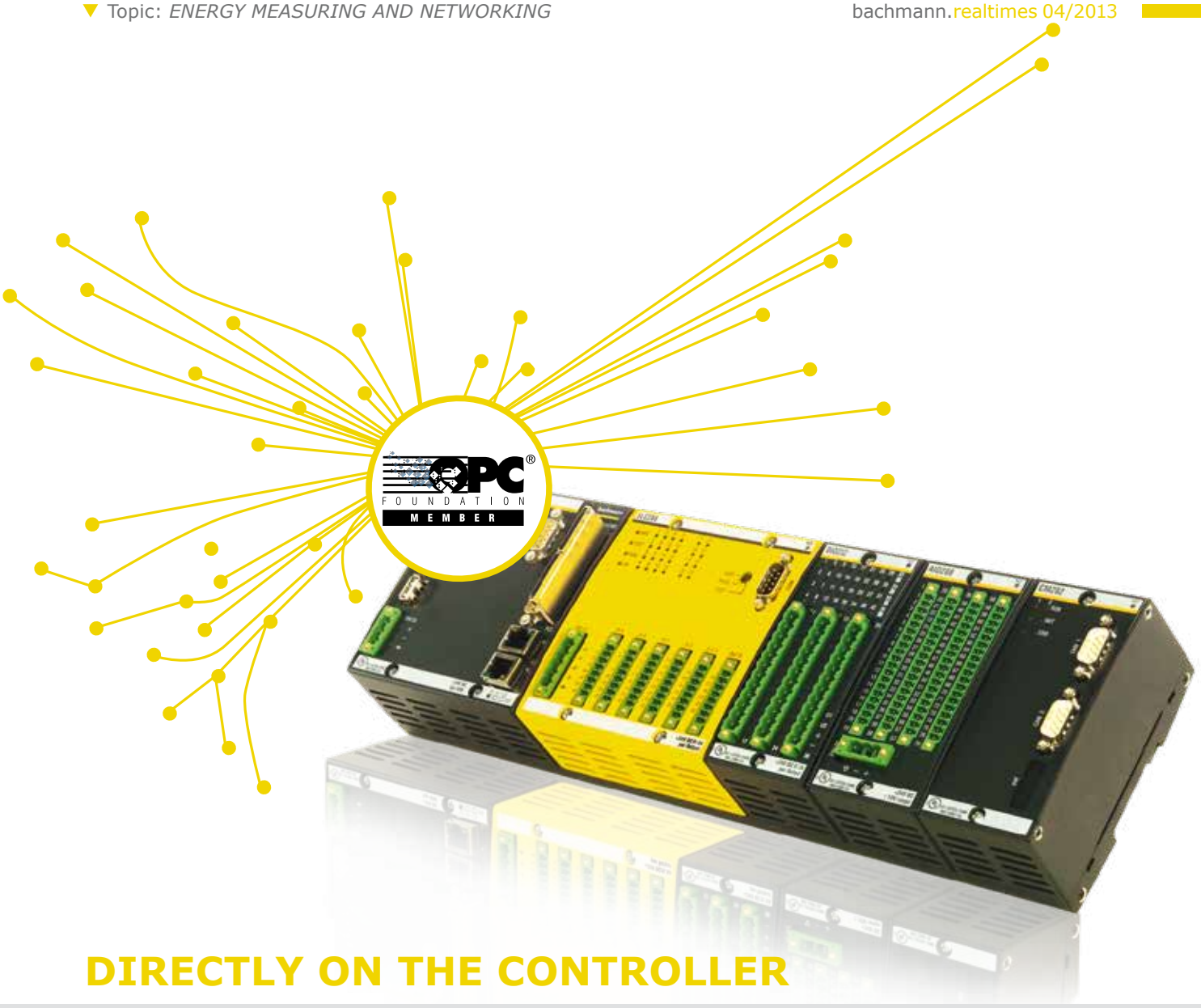
realtimes: *Why is everyone talking about multi-touch operations like dragging, tapping and flicking?*
Ronald Düker: The effective screen-based operation of machines and plants previously involved two main issues: the design of the graphical user interface and the direct interaction using a mouse, keyboard or conventional touch control. Initiated by the triumphant success of multi-touch on mobile terminals in the consumer sector, far reaching changes are now also taking place in the industrial sector. The new Windows 8 operating system which fully supports multi-touch is also giving more impetus to this topic. It is therefore hardly surprising that all the well-known manufacturers of industrial displays are currently developing multi-touch enabled products.

realtimes: *Why are mouse and keyboard no longer enough?*
Ronald Düker: Multi-touch or gesture control is in fact a further extension of the operation of technical interfaces. Gestures like dragging, tapping or flicking with one or more fingers can be used to transfer operations from the natural environment into a digital world – so that the real world and the virtual world merge even closer together. The on-screen movement of virtual objects through gestures creates appropriate associations with the real world, leading to a "natural interaction" with the user interface.

realtimes: *What does this mean for industrial applications?*
Ronald Düker: Any operating error on machines and plants may present a danger to persons and investments. In order to reduce this risk, industry must create improved interfaces that can be operated correctly and intuitively even in stressful situations. Multi-touch shows its strength here perfectly.

realtimes: *Do any general requirements have to be fulfilled for this?*
Ronald Düker: The technical terms 'NUI' (Natural User Interface) or also 'RBI' (Reality Based User Interface) describe the basic interaction with multi-touch applications. There is as yet no common standard for gestures. However in the industrial sector, the VDI/VDE Society for Measurement and Automatic Control (GMA) for man-machine communication are working on guidelines for the design of touch screen dialogs. This is currently being extended for operation with multi-touch.

realtimes: *What can Bachmann customers expect?*
Ronald Düker: The best interaction will only be successfully implemented if the technical systems support the interface appropriately. The Bachmann group of companies is working intensively on the issue of multi-touch – the relevant panels and the associated software will become available this year. ■



DIRECTLY ON THE CONTROLLER

Bachmann M1 system integrates OPC UA server

Bachmann electronic is expanding its portfolio of OPC products. An OPC UA server is now also available in addition to the OPC Standard and OPC Enterprise servers. This is run directly on the PLC with the VxWorks real-time operating system, thus making the previously required additional Windows PC unnecessary.

The M1 controller from Bachmann offers an impressive level of reliability. The operation of the server directly on the controller CPU thus not only guarantees maximum data availability, but also enables the direct connection to process data and the real-time recording of value changes with an exact time stamp.

SECURITY ON BOARD

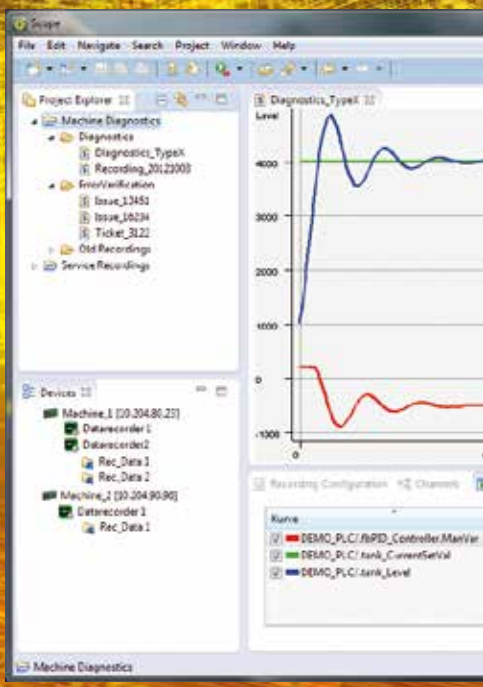
The OPC UA Standard is based on the latest network technologies and thus offers improved security compared to OPC Classic. Client and server identify themselves with unforgeable TLS certificates. If user authorizations were assigned for the process variables of the M1 controller, these are accepted by the UA server without any further configuration steps. The visualization client therefore also only has read and/or write authorization to those process values that were intentionally made available for him. Naturally it is also still possible to implement access without user authorization for applications in a closed network, such as in an assembly line. ■

NEXT GENERATION SCOPE

New data recorder with outstanding functions for the M1 controller

One of the central requirements in automation projects is the ability to log data and to analyze it with a high degree of accuracy. Oscilloscopes show their strengths particularly during commissioning, the analysis of functions or troubleshooting. Bachmann electronic has launched the new Scope 3.0 – a tool for many applications and better than ever before.

bachmann.
SolutionCenter



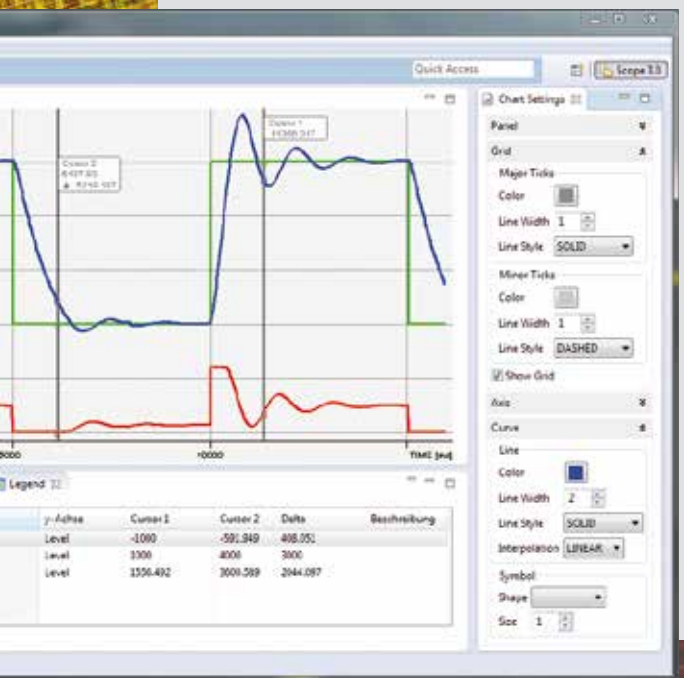
Modern machines and plants are mostly characterized by a high level of complexity. Commissioning, troubleshooting and maintenance therefore present a major challenge. Actual values and the tracing of process data and parameters over time are of key importance here. This requires tools that supply this data without any restriction and support the technician in his work with more detailed analyses.

DATA LOGGING AT HIGH SPEED

The core of Scope 3.0 is a powerful data logger: It offers an outstanding scan rate that can be selected in a range from 100 microseconds to 60 minutes. Thanks to the multi-tasking architecture of the M1 automation system, several data series can be logged in parallel and with different scan rates. Interfaces for several application programs increase the functionality of the product.

DATABASE WITH SELECTIVE ACCESS

Data archiving and data provision is a central aspect for an autonomously functioning data recorder. With Scope 3.0 a database archives all data in the background and offers selective access to it. Archive size and archiving intervals can be set to individual requirements. All data from the online buffer and also from the database is available at the same interface.



DATA ANALYSIS OF COMPLEX INTERRELATIONSHIPS

A powerful software oscilloscope can only be an effective tool if it has an efficient solution for viewing and preparing the data. This helps to understand the interrelationships involved and enables faster analysis options. The tool in Scope 3.0 for viewing and preparing data was further optimized: A simple click on the data recorder of an M1 controller enables data to be displayed immediately and makes it ready for analysis. The configurations can be managed in the work space and the logged data stored in a structured way.
Frequently used graph functions, such as measuring cursor, zooming, color adaptions are supplemented with important new functions – curve recalculation, the graphical comparison of logged data or the fast Fourier transform function are now directly available for the user. The user can also implement his own calculation methods or export formats.

SIMPLIFIED MAINTENANCE AND SERVICE

Previously in the event of a fault, a connection to the relevant machine or plant had to be established in order to fetch the relevant data for analysis. In certain cases, this even required work directly on site. With the new Scope 3.0 tool this is no longer necessary. The occurrence of a fault automatically initiates the logging of the relevant data. Data generated around this time range can be incorporated easily with the pre-trigger and post-trigger functions. After logging has been completed, a file with all the relevant data of the event is generated on the controller and automatically sent to the service technician by email – a key benefit for efficient support.

ONE PRODUCT, MANY POSSIBILITIES

Scope 3.0 is excellently suited for the convenient analysis of processes and troubleshooting during engineering, commissioning and the maintenance of machines and plants. Due to the wide range of functions and interfaces to the application programs it can also be used as a production data archive. In short: Bachmann's new Scope 3.0 offers an impressive performance due to its simple operation and wide range of uses.

TANK MANAGEMENT WITH SAFETY

Reducing complexity on board and increasing efficiency

Market conditions are forcing shipping companies and owners to achieve greater efficiency with a reduced crew on board. A safe and reliable controller and monitoring system are therefore essential. With SANSYS and SANVISU, Wilhelm Sander Fertigung (WSF) is initiating a new era of on board tank management. In the event of a disconnection or a failure of the main components, SANSYS provides universal redundancy and network redundancy. The basis of the system is made up of solutions from the portfolio of Bachmann electronic.

The system is what WSF GmbH calls its ‹Task Carrier›: It gives the user complete control of the entire tank management of the ship or installation. SANSYS supplies reliable information about tanks – whether they are filled or discharged – as well about valves and pumps – whether they are working precisely. It also supplies the crew or the owner with information about the tank contents, temperatures and pressures.

SINGLE OR REDUNDANT CONTROLLER CONFIGURATION

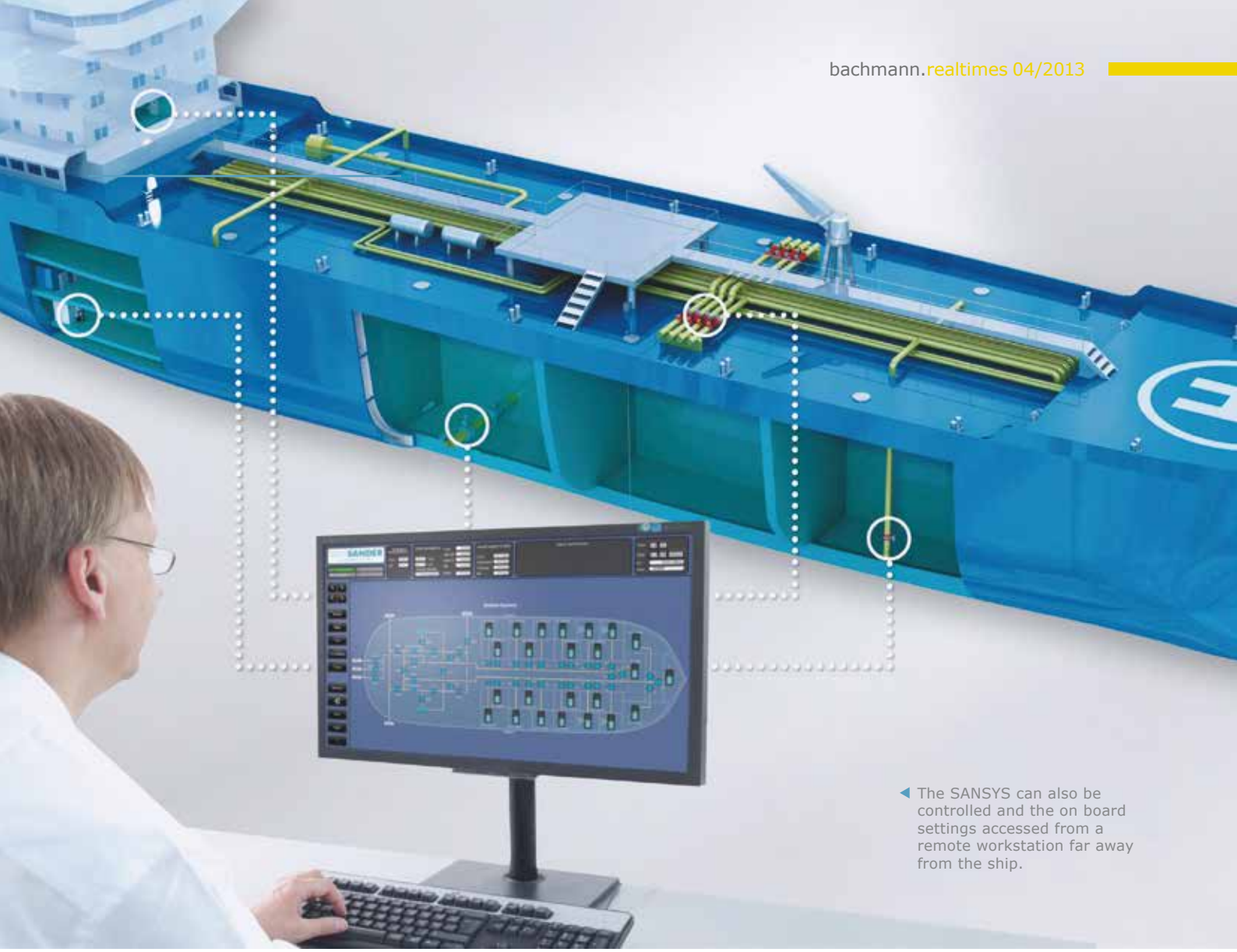
The company, which is based in Bremen, Germany, uses the powerful MPC240 and MC200 controllers from Bachmann for the implementation. This can be designed either as a single or a redundant system. The use of a redundant control system for the WSF application can be designed for both network and CPU hot standby redundancy. The implementation is also straightforward since the hardware components and the application software are identical for a single and redundant system.

With CPU hot standby redundancy, both masters run synchronously. Bumpless switching is executed and updates or program changes can be carried out whilst the system is running. The software hot standby redundancy consists of an automatic system comparison as well as a time synchronization and automatic failover.

Network redundancy provides protection from failures in the communication structure with a switchover time that is shorter than a PLC cycle. It features an integrated diagnostic function for the status and quality of the network connection and can be used for both cyclical and acyclical communication.

SAFETY FOR CUSTOMERS

The controller is used together with the robust input and output system (IO system) consisting of densely packed I/O modules that are a match for the harshest environmental conditions in the offshore sector. “Bachmann supplies a redundant system with standard components that offer our customers maximum safety,” says Klaus Milde, technical manager at Wilhelm Sander Fertigung.



The SANSYS can also be controlled and the on board settings accessed from a remote workstation far away from the ship.

The on board power supply is also redundant in order to prevent failures and can be switched to manual or automatic. All devices are also protected from overvoltage.

FURTHER OPTIONS FOR MORE FUNCTIONALITY

SANSY can communicate with other systems such as a loading PC or an alarm and monitoring system (AMS) using the interfaces provided and those established in shipbuilding. Remote maintenance is carried out using secure Internet connections or with a local update of the application using a memory card (PC, CF) or standard USB stick.

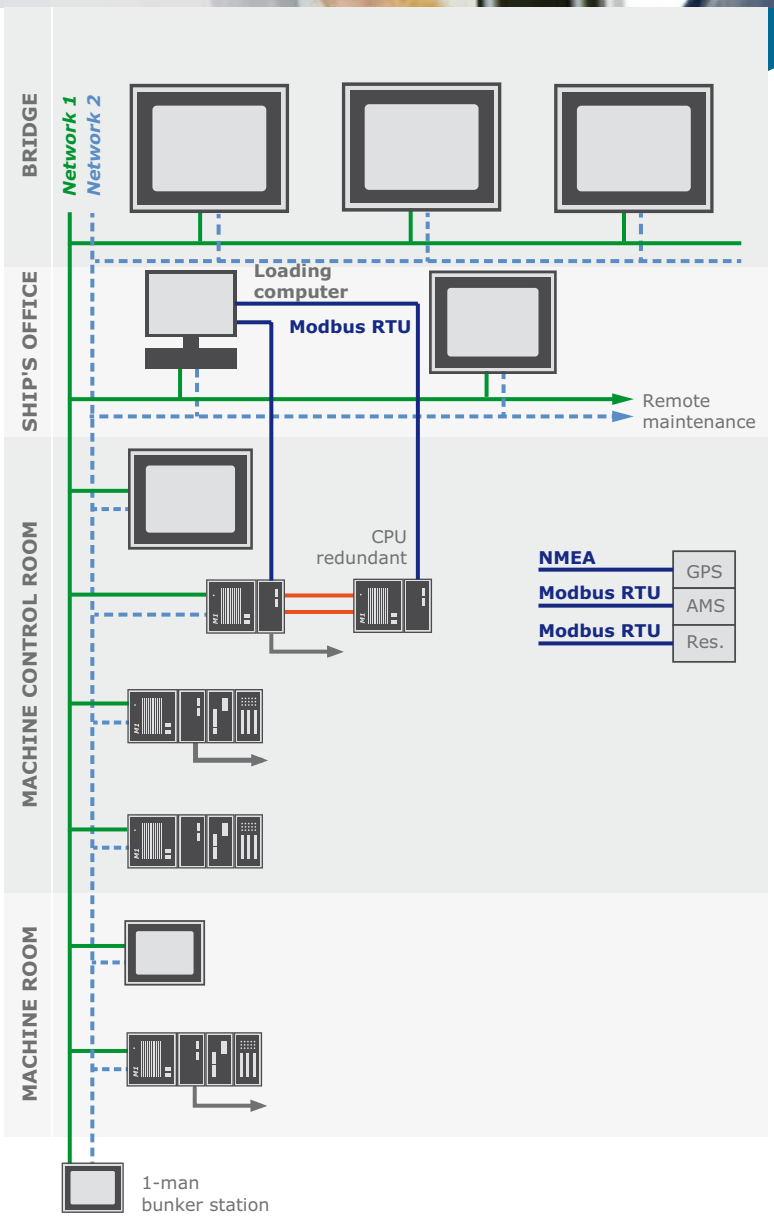
Several applications can be run in parallel and autonomously using the Bachmann controller. Water ingress detection and/or condition monitoring can be added as an option to standard applications such as valve control, tank content measuring, pump control, simulation, deck lighting and fan cooling if required. Condition monitoring, for example, can be used to give early warning of wear on actuating elements such as valves (flaps) and pumps. "Thanks to the extensions possible, we are well equipped for the future and can expand our portfolio without having to change the existing application," says Klaus Milde.

WSF SANDER
AUTOMATION SYSTEMS

The trading company was founded in 1926 and Wilhelm Sander has had its own production since 1984. The Bremen-based company initially concentrated on valves and drives and is now a system supplier of remote control systems for ship valves for the shipbuilding and offshore sector.

◀ The OT200 touch display from Bachmann allows simple operation of the tank measuring system as well as local control of valves and pumps.

▼ Overview of network and configuration of the tank management application of Wilhelm Sander Fertigung.



SIMPLE HANDLING THANKS TO THE PROJECT MANAGER

The PLC programs required are created by project designers and service technicians using the Project Manager of Bachmann's Maritime & Offshore Essentials (MOE). "The Project Manager enables us to automatically generate our PLC software error-free in a short space of time," Klaus Milde, technical manager at WSF, highlights and adds: "Objects such as valves, pumps and tanks can thus be created in a library and automatically linked with the PLC variables."

Frequently used valve movements with activation sequences, delay times and the activation of the required pumps can be defined so that the ship's crew can call them up and start them. This application offers greater convenience and safety. "Thanks to the Valve Editor we can meet customer requirements right up to shortly before shipment," says Klaus Milde and adds: "All project-related data can be parameterized. No reprogramming is required for individual fine tuning."

An OT200 operator terminal is installed in the control cabinet door to allow local operation. All Bachmann products come with the necessary shipping approvals such as Germanischer Lloyd (GL), Lloyd's Register of Shipping (LR), Det Norske Veritas (DNV), American Bureau of Shipping (ABS) and Bureau Veritas (BV), as well as the SANSYS and SANVISU systems.

Several applications can be run in parallel on the Bachmann controller. We are thus well equipped for the future and can add condition monitoring, deck lighting and water ingress detection to our portfolio without having to change the existing application.

Klaus Milde,
Technical manager, Wilhelm Sander Fertigung GmbH

VISUALIZATION – LOCATION-INDEPENDENT AND SCALABLE

The associated SANVISU visualization system provides the operator interface for controlling and managing all SANSYS functions. Here also, the Bremen based company relies on a product from Bachmann and uses the atvise SCADA system. "The innovative and scalable visualization system and the apps for Apple and Android enable me to have my alarms, tank content data and more instantly in view," Klaus Milde says.

From the bridge or from the ship's office, I can access the web application with a standard browser from any location and from any device. The installation of any additional software is unnecessary. Thanks to the vector graphics (SVG) used, the application is scalable without any loss and can be adapted to any screen size – regardless of whether this is for a laptop, a tablet or a smartphone. The zooming of the details of all ships areas can be carried out without any problem.

CONVENIENT TANK CONTENT MEASUREMENT

Tank measuring with SANSYS is carried out as follows: Geometric data for the tanks as well as other ship-related parameters from the tank list of the shipyard, the so-called sounding list, are read in by the Bachmann controller in the form of a CSV file. The auto configuration of the individual tanks through the read operation is a key element in the standardization of the application program. Changes to the PLC source code thus become unnecessary since any adaption is carried out by inputs via the operator interface of the visualization. The reading in of a file containing the tank data saves any labor-intensive and error-prone editing of tank lists during commissioning in the shipyard. Data from the fuel system can for example be transferred to the ship owner's cell phone.

The systems from WSF also come with a type approval from the well-known shipping classification societies such as GL, DNV and LR. Wilhelm Sander Fertigung offers its customers a service for remotely monitoring systems by its qualified personnel in order to suggest targeted measures in response to changes. For this, the system status is transferred to WSF for analysis.

In recent years, the company has produced a number of innovations and further developments. From the former trading company, WSF, with its engineering, service and consulting portfolio, has grown to become a system supplier for ship building and the offshore industry. ■

SUSTAINABLY REDUCING ENGINEERING COSTS

ISO 50001 helps companies to increase their competitive strength

Only those companies are successful in the market that know how to use their resources efficiently. If the energy costs for a produced item are reduced, this also reduces the manufacturing costs. The more energy-intensive a manufacturing process is, the more the company can benefit from measures to increase energy efficiency. Long-term solutions are required, particularly in view of the long-term increase in energy costs. In this respect, an energy management system (EnMS) compliant with ISO 50001 is ideal for companies with global operations. This worldwide standard supports companies in introducing and implementing an EnMS successfully. In this way, companies with an energy-intensive production can significantly increase their competitive strength.

The ISO 50001 standard is issued by the worldwide International Organization for Standardization or ISO for short. It aims to ensure the uniformity of measures to increase energy efficiency. Companies that comply with the standard can get themselves certified in accordance with ISO 50001:2011.

SPECIAL SITUATION IN GERMANY

Besides the basic benefits of energy-efficient plants, the legislators in Germany offer further support for the introduction of EnMS to ISO 50001. The German Renewable Energy Law (EEG) created the opportunity for energy-intensive companies to become totally or partially exempt from the renewable

The increase in energy efficiency is ecologically and financially a benefit.

Andreas Nenning
Product manager

energy levy. This is aimed at preventing companies from being poorly placed in relation to international competition. This surcharge can be passed on from the utility companies to the end consumer and from 2013 is 5.277 cents per kilowatt hour. Different requirements have to be fulfilled in order to benefit from this exemption, also called the industrial privilege: The proportion of electricity costs in relation to the gross value added must be at least 14%, the minimum annual consumption must be one GWh and an EnMS system to ISO 50001:2011 must be installed.

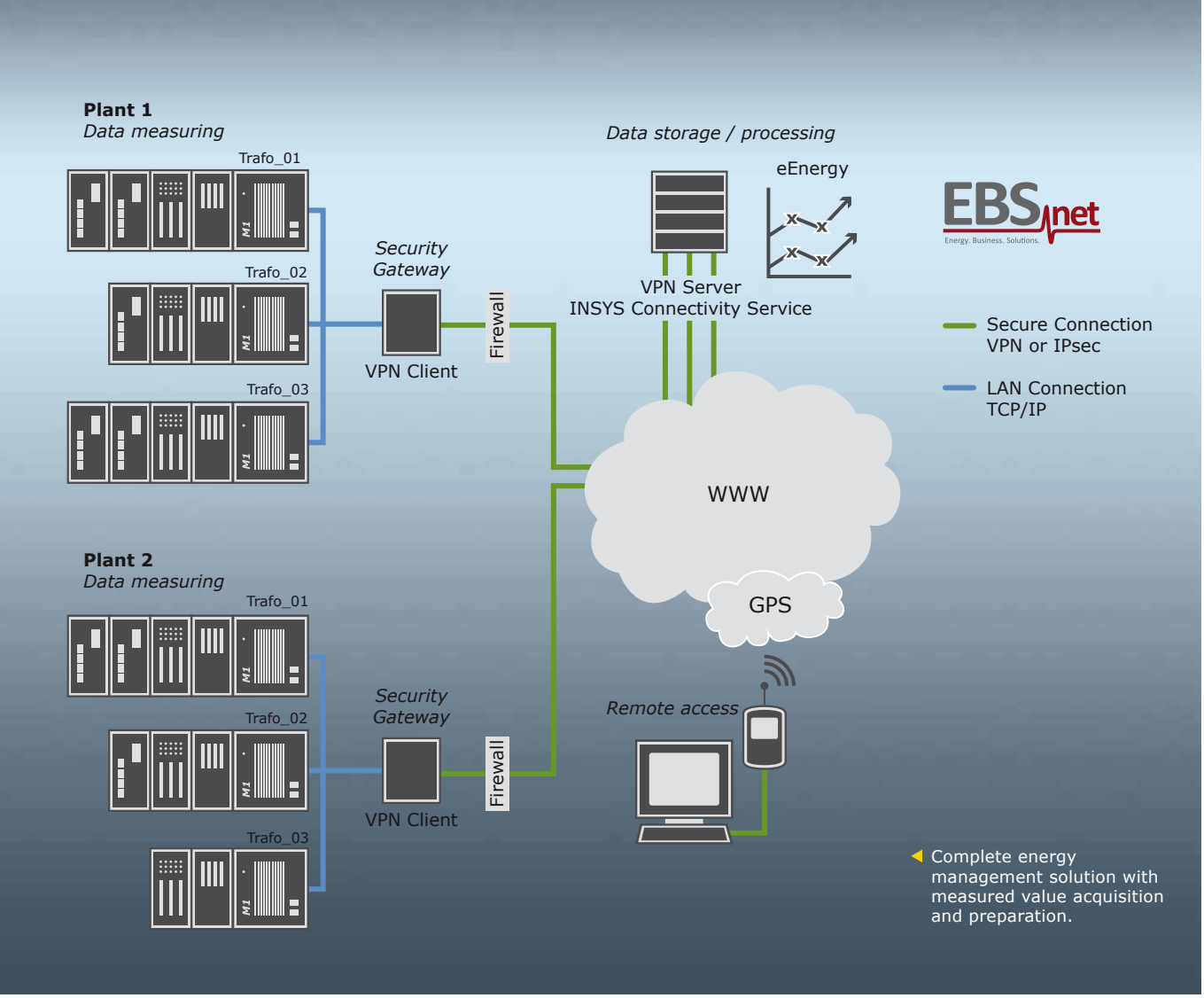
CHALLENGES OF ISO 50001

One of the greatest challenges in the technical implementation of energy management systems is the definition of the key indicators for measuring the increase of energy efficiency, the so-called energy performance indicator. For long-term success, it is critical to consider precisely WHAT has to be measured. Over 100 years ago, Mark Twain, once remarked: "Data is like garbage. You'd better know what you are going to do with it before you collect it."

The energy performance indicators of a production company must not be dependent on the throughput and seasons and must also particularly exclude events such as regular maintenance intervals. The aim here must be to find comparison values that are only affected by energy-related factors. Only in this way is it possible to compare different production lines or factories. Typical key indicators can for example include "electricity demand per produced item" or "heat demand per square meter of floor space".

IMPLEMENTATION WITH BACHMANN

Bachmann is a competent partner that offers support to companies wishing to gain a long-term competitive edge through the introduction of an energy management system. As well as experience in this field, Bachmann can offer an innovative product portfolio. The optimum complete package that meets the requirements at hand can be selected from a large number of grid measuring modules. The GM200 product series is of particular interest here. These devices, specially developed for

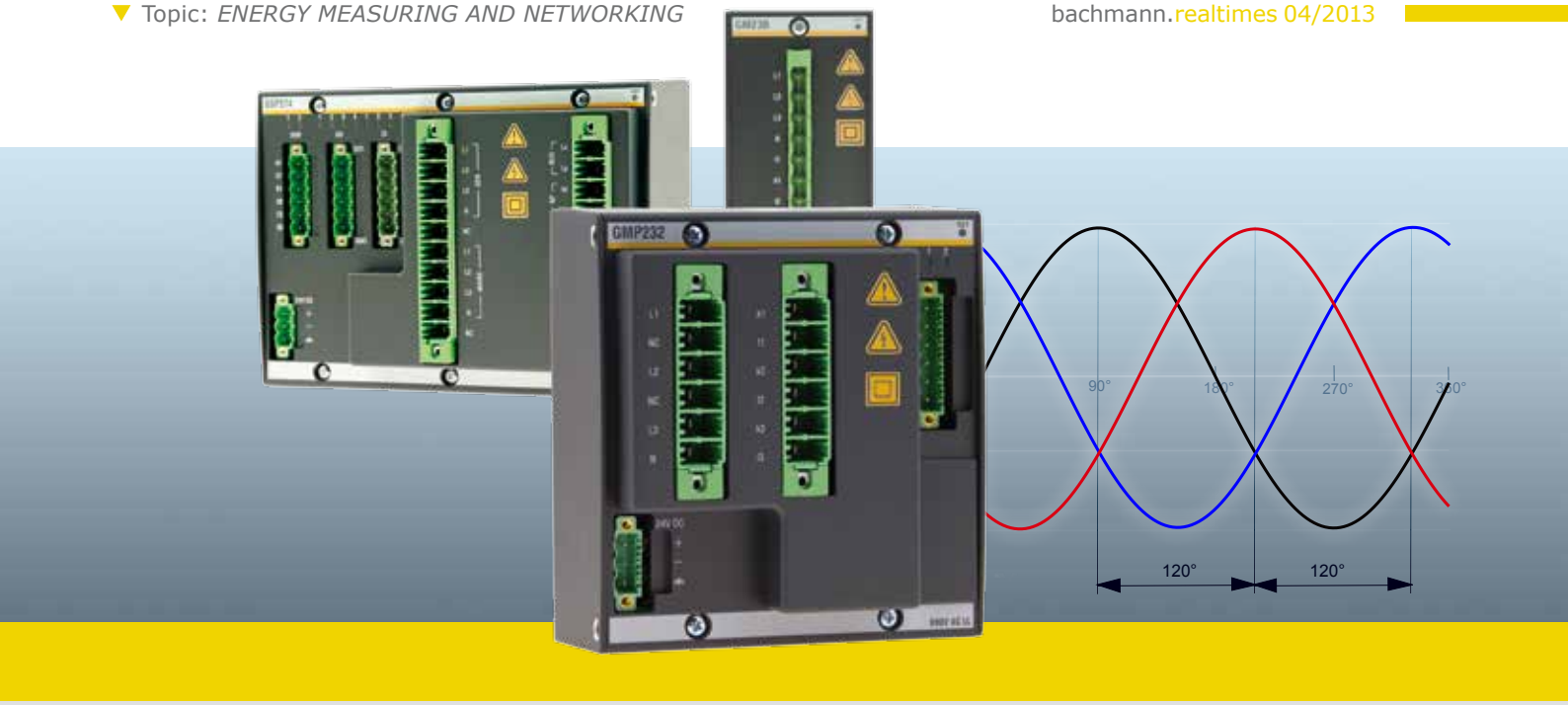


direct grid measurement, already prepare data on the measuring device and thus relieve the processing load on the PLC.

The integration in the surrounding system environment is also important when implementing energy management solutions. This starts with the selection of suitable modules, as well as the correct connection of current and voltage transformers, right through to the safe connection to central databases and their analysis tools. The system interfaces must be mentioned in particular here: Bachmann solutions are based mostly on open and certified standards and regulations, in order to ensure problem-free connection. Besides the use of clearly designed tools for project engineering and maintenance, such as the SolutionCenter, Bachmann solutions also allow the simple integration of web servers, FTP and email clients or global time synchronization. Furthermore, experienced partners in the energy sector can provide answers to questions on the reliable integration in existing management solutions. These include, for example, the INSYS icom with solutions for secure networking or EBSnet, featuring software allowing the central acquisition and preparation of the measured data.

A BENEFIT – ECOLOGICALLY AND FINANCIALLY

The increase in energy efficiency not only offers obvious ecological benefits – it is also financially necessary. This particularly applies to companies which have to master energy-intensive production processes. Subsidy schemes have already been established in several countries to provide incentives for investing in EnMS. These incentive systems are designed to improve the competitive strength of a country's industrial sector and also to reduce dependence on electricity imports, the pressure on grid expansion and also the tax burden for electricity consumers. In addition to all the benefits described, one issue is also a fact: Every kilowatt hour of electricity that is saved does not have to be generated. ■



ENERGY SUPPLY UNDER CONTROL

Increased productivity and quality with powerful grid measuring modules

Through the use of high quality grid measuring modules from Bachmann electronic, defined energy performance indicators can be measured in real-time and monitored. In this way, they can help to successfully control critical situations which may occur with the operation of modern energy supply systems.

Monitoring systems for the energy supply are used to document the supply quality. They enable the connection to energy management systems and thus allow the energy efficient control of production processes. At the same time, they help to reliably control any faults that may occur in the power supply.

DATA LOGGING -
DOCUMENTATION OF SUPPLY QUALITY
Bachmann grid measuring modules provide event lists and an integrated data recorder to help with the documentation of supply quality. Events are logged retentively with an exact time stamp. In the event of a fault, the real-time scan values are also logged with a resolution of up to 100µs over a period of at least 4 seconds.

STATISTICS –
CONNECTION TO ENERGY MANAGEMENT SYSTEMS
The Bachmann grid measuring modules store statistical performance indicators, such as minimum and maximum values, energy meters and total harmonic distortion (THD). These statistical grid variables are made available easily via the Service Variable Interface (SVI) or a PLC library. They can be sent cyclically via FTP or email to higher-level energy management systems.

CONTROL -
ENSURING OPTIMUM OPERATION
If certain energy supply targets cannot be reached, the operational control must take counter measures. Automated control systems allow intervention virtually in real-time. Control units from Bachmann are particularly suitable for this, since some monitoring functions can be executed directly by the grid measuring modules and simply integrated via PLC tasks. In this way, the relevant actuators can be controlled directly and without delay.

PROTECTION -
CONTROLLING FAULTS RELIABLY
In the event of a fault, circuit-breakers can disconnect the affected branch circuits from the grid. In a solution consisting of Bachmann products, these are switched directly by relays integrated in the module or via standard communication protocols such as IEC 61850.

PERFECT VARIETY
Energy monitoring requirements are as different as the various production plants and processes. The large range of grid measuring modules from Bachmann, the scalable performance of the main CPU, the modular I/O modules and state-of-the-art engineering software guarantee a functionally optimum and cost-efficient solution for any requirement. ■

THE MULTI-TALENT

GIO212 I/O module with unique features

MultiFeatured

MultiCompatible

MultiFunctional

MultiEfficient

Digital and **analog inputs / outputs**

I/O

12/24 channels

Temperature sensors and **thermocouples**

Overload proof, short circuit proof and **protected against external voltage**

Voltage and **current inputs/ outputs**

Counters and **PWM**

The GIO212 is an I/O module suitable for universal use. Interfaces for a wide range of sensors and actuators make the module the automation specialist's equivalent of the "Swiss Army Knife": As a multifunctional I/O module it enables dozens of special modules to be replaced with a single one. The configuration is completed in next to no time in the Bachmann SolutionCenter.

The GIO212 offers an impressively wide range of functions, thus making the use of expensive additional modules in most places unnecessary. All channels of the universal I/O module can either be configured as analog or digital inputs or outputs, as counters or for temperature and resistance measurement. Depending on the function selected, a channel can be assigned up to two functions (mixed mode operation). The digital outputs also come with a special feature: Each channel provides an output current of 100 mA and can also be configured as a push-pull driver, in addition to the ground or positive switching: A simple configuration can thus enable a free digital output to be used, for example, to feed a 20mA sensor. Cable breaks and the power supply can thus also be monitored without any time consuming integration, without an additional module and without further costs.

MAXIMUM FLEXIBILITY AND EFFICIENCY

The GIO212 enables changes to a project to be implemented more simply at short notice. With the GIO212, the search for alternative modules becomes unnecessary, and plant conversions, parts list modifications, reprogramming and the necessary tests become a thing of the past. Only a few simple settings need to be adjusted in the configurator. Another benefit: The simpler management of spare parts – with the GIO212 only one module needs to be kept in stock instead of a host of different variants.

SIMPLE CONFIGURATION...

The design of the GIO212 allows a fast and simple configuration for standard sensors. An extensive and detailed adjustment of settings can be made for complex requirements. A utility program guides the user through the basic configuration. This enables the name and position of the module and its safety options to be selected. From the 15 basic types, the basic channel type can be selected just as quickly, as well as the setting determined for the automatic heat dissipation management. Alternatively, the user can select a predefined channel configuration from his template library. For function modes requiring several channels, such as motor controls or rotary encoders with A/B tracks, the configuration system automatically reserves the additional channels needed.

... WITH IN-DEPTH DETAIL IF REQUIRED

More detailed settings such as signal filtering can be made in the channel configuration. Depending on the basic signal type selected, only the configurable parameters are shown for selection. The actual terminal assignment for this is always displayed. This simplifies the control and creation of the circuit diagram through additional information such as the display of the signal type.

EXTENSIVE DOCUMENTATION

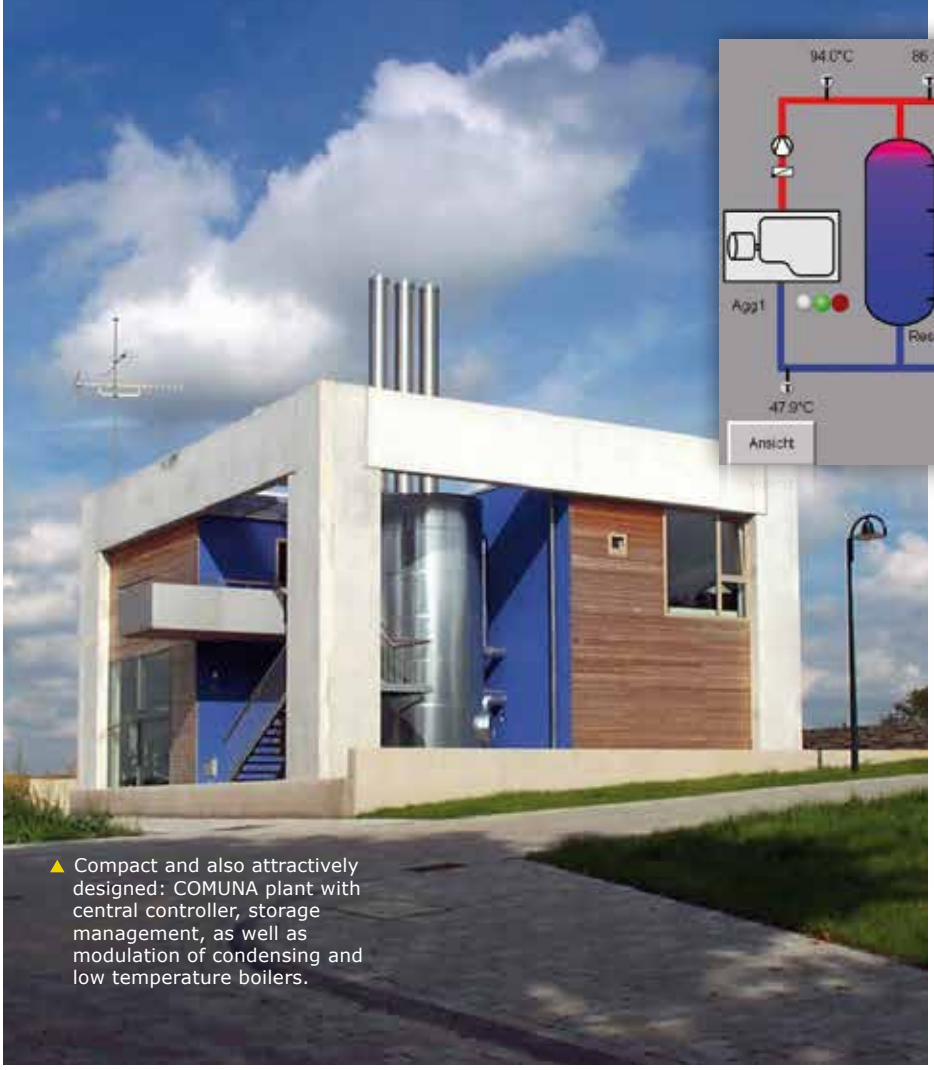
Each configuration can be stored as a template and can be changed as required. Frequently used sensor types or special applications can be reused quickly and simply in future projects. A template can also be stored with any additional information such as data sheets or characteristics. If necessary, these attachments can even be stored directly on the controller. For service technicians, this means an enormous time saving since all relevant documents become available with a single click of the mouse.

The complete module configuration, including all settings and additional information, can be exported as a PDF file. This therefore considerably simplifies documentation and cross-departmental collaboration.

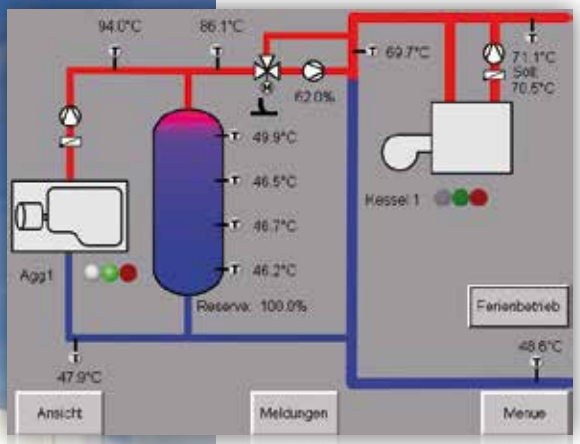
COMPLETE PROGRAM FROM A SINGLE SOURCE

Bachmann controls combined heat and power units

Combined heat and power units (CHP units) utilize the energy in use with a particularly high level of efficiency. Compared to the separate generation of electricity and heat, they save around 40 percent. As specialists in gas-powered CHP units with small to medium outputs, COMUNA-metall offers its customers an all-round package and also expects this from its controller supplier. For this reason, the company chose Bachmann electronic as its supplier.



▲ Compact and also attractively designed: COMUNA plant with central controller, storage management, as well as modulation of condensing and low temperature boilers.



▼ Clear visualization: Operating states are displayed and setpoints adjusted on the WT205 web terminals.

COMUNA metall Blockheizkraftwerke

Founded in 1980, COMUNA-metall currently has around 90 employees. The company is headquartered in Enger, Germany, and is involved in the production and maintenance/ service of gas-driven CHP units with small to medium outputs. The company builds complete heating systems as well as decentralized power supply networks with combined heat and power generation, and operates these plants as service providers.

The core expertise of COMUNA-metall is in the manufacture of complete gas-driven CHP modules with an electrical power output from 50 to 112 kW, corresponding to 100 to 240 kW of thermal power. The company, based in Enger, Germany, offers two standard series with the so-called thermo-acoustic enclosure, which are suitable for operation with different gases such as natural gas, liquid gas, sewage gas or biogas.

In 2010 COMUNA carried out a benchmark because the module controller previously used had been discontinued. "Important selection criteria here were innovative programming, simple communication and networking to peripheral devices, price, robustness, delivery time and product continuity, as well as the experience of the manufacturer in the CHP sector," Marco Riffelmann, master electrical engineer at COMUNA-metall, explains the criteria.

CHOOSING THE BACHMANN COMPLETE PACKAGE

The M1 controller and the WT205 V visualization system were eventually selected. The CHP specialists have been using the automation system from Bachmann electronic in series production since the beginning of 2011. In all, more than 150 plants are now equipped with an M1 controller.

"The most important reasons for choosing Bachmann was the ability to obtain everything from a single source – from the modular PLC right through to plant visualization – and also the possibility to integrate this in the already existing communication structure," Marco Riffelmann explains the decision.

MULTIPLE USES FOR BACHMANN

The Bachmann systems have a wide range of uses in the COMUNA combined heat and power units: For example, the entire CHP unit controls involving a high degree of standardization are implemented with the M1 automation system. The programs of the CHP modules are identical and downward compatible. The WT205 V web terminals enable all operating states to be displayed and also allow the changing of setpoints.

Bachmann products are also used in the so-called central controller, the higher-level PLC for CHP units in heat generating plants, and in the project configuration. "Communication with the COMUNA headquarters in Enger is implemented via Ethernet, DSL or UMTS, by which for example the relevant project managers can access 'their' plants," Marco Riffelmann explains. This is made possible through the use of a VPN tunnel both to the plants and also to employees and customers. The Ethernet integration of a network analyzer is implemented via Modbus/TCP. Bachmann products also provide the communication with the building management system.

» With Bachmann we obtain everything from a single source.

Marco Riffelmann
Master electrical engineer at COMUNA-metall

EXTENDED PORTFOLIO

Besides the production, maintenance and service of CHP units, COMUNA also erects complete heating plants and decentralized power supply networks using combined heat and power generation, and operates these plants as an energy service company.

After delivery, the company offers full maintenance contracts to ensure fault-free operation and also provides service centers throughout Germany. The company currently looks after around 1000 CHP units, with more than 90 percent of them via full maintenance contracts. Teleservice functionality provides access to around 480 plants.

HIGH LEVEL OF QUALITY AND AVAILABILITY

"The use of Bachmann technology has enabled us to achieve both a high standard of quality and a high level of availability for our CHP units," says Marco Riffelmann.

The customers of COMUNA-metall primarily consist of local authorities and municipal works as well as utility companies, but also include housing associations and industrial and service companies in the private sector. They value the high plant availability provided and the fact that COMUNA is a single source supplier for everything – from the hydraulic and gas integration, to exhaust systems, complete electrical installations including the application procedures, right through to genuine full maintenance. ■

ENGINEERING'S THAT SIMPLE

Flexible project management with intelligent variant management

bachmann. SolutionCenter

M-Base Version 3.90 also offers many new innovations in the SolutionCenter. The modern design of the user interface makes the major development steps clear. A large number of new and helpful functions are provided for working with the M1 controller. The simplified project handling in particular, using a well thought-out variant management function, simplifies engineering.

Nowadays plant builders almost always have to make customer-specific adaptions. However these often have an effect on configurations and machine programs. For this it was previously common practice to store a copy of an entire project with all its contents and store customized changes in it. Any adaptions in the original project then have to be transferred manually in all versions. The reason for this is well-known: Engineering tools do not satisfactorily support variant management, and automation projects, configurations and development projects are often rigidly interconnected with each other.

LINKING PROJECTS SIMPLY

With the introduction of the perspective solution, the development projects have been brought together more closely in the SolutionCenter. Easily created links are used to assign subprojects (PLC, C/C++, Safety and VisDesigner projects) to the overall solution. This enables the realistic combination of all the projects and configurations belonging to a particular machine. A project can also be linked with several overall solutions.

Helpful functions, such as the indication of all interdependencies, also simplify working with many projects. The size and content of an entire automation project is indicated at a glance, whilst navigation is child's play. In order to simplify central data storage, archiving and working in a team environment, an automation solution with all assigned projects can be stored in its entirety in a version management system or exported and imported in a single step.

VARIANT MANAGEMENT BECOMES CHILD'S PLAY

The key feature in linking projects is the flexible management, structuring and automatic transfer of the latest versions to the assigned overall solution. Genuine links to projects make it possible to maintain changes at just one central location, thus minimizing maintenance effort. In future only one solution is created for a customized variant, and all other projects can then be linked accordingly. The management of uncountable project copies is no longer necessary. Working in a team environment is also made easier: With just a few clicks of the mouse, an entire automation project or the latest changes can be exchanged with all team members. ■

SAVING COSTS WITH LINUX V1.10

Image solution considerably reduces maintenance effort

The new version 1.10 from Bachmann electronic offers a Linux operating system image that is designed for the operator terminals of both the OT200 and also the OT1300 series. The same image can be used on both device families irrespective of the screen diagonals. This helps to considerably reduce maintenance costs and also keeps logistics requirements down to a minimum.

Commissioning can be carried out either locally on the terminal or via a secure Ethernet connection. The relevant terminal setup software was completely updated and enhanced with important functions and diagnostic options.

SIMPLE UPDATE, FLEXIBLE APPEARANCE

A mechanism was developed for the simple updating of the image or for adding customized functions by remote access. This only updates the operating system sections, and leaves the user-specific sections of the data carrier untouched.

The appearance of the dynamic or static startup screen of the operator terminal can be adapted very easily to individual requirements with the new Linux V1.10 operating system.

SIMPLE PROGRAMMING

An operator terminal with Linux V1.10 from Bachmann electronic is the ideal platform for state-of-the-art, sophisticated and attractive process visualizations based on pure web technology. These can for example be created without any programming knowledge using the 'atvise builder'. ■

SUCCESS FACTOR: »PERSONAL SUPPORT«

Know-how and support first hand

Our teams work locally, know the special characteristics of the region, speak the language of our customers and are also organized by sector and technological expertise.

Wolfgang Papesch
Director of sales at
Bachmann electronic

Due to the fast changing market environment, companies are forced to respond even quicker to a wide range of requirements. In order to keep plant outages and downtimes to a minimum, the optimum planning and deployment of all the resources involved – people and machinery – are vital. With the personal support provided by Bachmann electronic for all customer needs, the company is able to ensure the optimum conditions for this. We spoke to Wolfang Papesch, sales director at Bachmann, about the company's extensive service commitment.

realtimes: *What does Bachmann fundamentally offer its customers?*
Wolfgang Papesch: We aim to help our customers succeed. For this we supply top quality and technologically leading edge products on the one hand, and offer a personal service on the other, beyond the entire life cycle of the installations supplied – reliably, round the clock and worldwide!

realtimes: *How do you manage this across the wide range of different sectors?*
Wolfgang Papesch: The extensive technological know-how and the excellent sector expertise of our personal customer advisers at Bachmann offer our customers a critical edge in the competitive environment. I would describe it like this: Our service offer has a definite face. From the very beginning, our customers are assigned their own technical support adviser who has a detailed knowledge of the challenges in the sector concerned. They obtain really direct information and support, i.e. not via the usually anonymous support portals that are commonly used elsewhere. The feedback from our customers shows that this is a decisive factor in choosing Bachmann.

realtimes: *What kind of support can a customer expect from his technical support adviser at Bachmann?*
Wolfgang Papesch: His personal contact will answer any question on all aspects of the automation solution: They will provide support for the engineering, advice on the selection of the right products and systems, examine the solution concept together with the customer, and offer advice with regard to the integration of third-party products or appropriate fieldbus and network connections. The personal support adviser can also be called on by "his" customer for all matters of after-sales support, and will offer the right competent support during commissioning, in selecting spare parts and equipment, as well as with regard to migration or upgrade issues. Our customer advisers are also the interface to all internal departments at Bachmann, such as system development or product management. In this way we ensure that the future requirements placed on products and solutions flow directly into the product development process.

realtimes: *How is the provision of worldwide support ensured?*
Wolfgang Papesch: Our teams work locally, know the special characteristics of the region, speak the language of our customers and are also organized by sector and technological expertise. We therefore have European technical offices in Austria, Germany, the Netherlands and Denmark, as well as offices in the USA, China and India. At our offices in Rudolstadt, Germany, we also have a Condition Monitoring Center, where the condition of over 1,5000 wind power plants is monitored.

realtimes: *How do new customers find access to Bachmann technology?*
Wolfgang Papesch: We offer a wide range of training programs so that our customers become acquainted with the Bachmann product world quickly and efficiently. If necessary these can be tailored to individual customer requirements. Our training courses are aimed at application programmers, commissioning engineers, service and safety technicians, as well as project managers – from the beginner to the advanced user.

realtimes: *How are the training courses structured?*
Wolfgang Papesch: A range of basic training courses geared to specific product topics are available. They provide a fast and comprehensive introduction and give participants a well-founded overview of the project engineering, commissioning, configuration and diagnostics of the Bachmann automation devices. The practically oriented training seminars are held in the Bachmann branches, and can also be held on location at the customer's premises if required.
More in-depth special training courses based on the basic training seminars are on offer for a wide range of subjects such as programming (IEC61131, C++, MATLAB/Simulink), SCADA, visualization, closed-loop control, Motion Control, etc.

realtimes: *How does a customer get in touch with the Bachmann service?*
Wolfgang Papesch: As well as the direct personal contact, we also provide a Help desk for our customers (https://helpdesk.bachmann.info). In this portal every customer can log incidents via his personal access, and follow and comment on the status of the cases (history) processed by his personal support adviser. The portal also allows the customer to download items such as system software or find answers to important questions in the know-how database.
The Remote Service is another important facility by which we can offer our customers direct support. The M1 automation system already provides the technical basis for this: Nowadays, secure access and encrypted data transmission direct to the controller are standard features. The most important aim of the Remote Service is to speed up the diagnostic and problem solving process also by working directly on the customer's desktop. For this we use state-of-the-art remote tools such as WebEx. This enables us to provide personal and real-time support at any time – in spite of the large distances sometimes involved.

Many thanks for this interview.

OPEN COMMUNICATION

M1 controller excels with protocol diversity

The extensive distribution of electricity is a standard amenity virtually everywhere in the world. However, the operation of this vital infrastructure requires more than just power cables for transporting energy. Complex control circuits are also needed in order to ensure the stable frequency and voltage of the grid supply. Electricity production also has to be planned predictively for between several hours and days. In some cases with decentralized plants, such as combined heat and power units, "schedules" with quarter hourly setpoint definitions are stored in advance. Suitable manufacturer-neutral data interfaces are required to process communication.

The key difference between the connection to a control room and an Ethernet-based fieldbus (e.g. Profinet) is the expansion to other distributed networks. In this case, the Internet may also be part of the transmission path. Although real-time operation is not normally required, all relevant signal changes, such as the opening of a circuit-breaker, must reach the control room with exact time stamps and quality information. These make it possible to arrange all the data from widely distributed individual components in the correct chronological order and thus correctly record the sequence of events and their effects. The closing of the communication connection is mostly also permissible. The relevant device then stores the information until the connection is reestablished.

BENEFIT: MODULAR SOFTWARE CONCEPT

The solutions of Bachmann electronic are open for a large number of different communication protocols. These are available as tested software modules that can be used immediately and added to the finished automation solution at a later time. The modification of open-loop, closed-loop and monitoring programs that are already in place is not necessary.

The modular software concept thus allows flexible adaptions to be made according to the different requirements and regulations of the grid operators. Unlike solutions that implement communication by calling function blocks from the operational control program, a complete function test is unnecessary. This simplifies the integration in a control station system – thus saving time and money. ■

FACTBOX

Communication protocols

The following communication protocols are available for the M1 controller:

- IEC61850 and IEC61400-25
  Communication protocol specially developed for energy applications, that not only provides a vendor-independent definition of the communication layer but also the structuring, designation and meaning of the 'data attributes'.
- IEC60870-5-104
  Technical predecessor of IEC61850, in which the data is not structured hierarchically but is shown as a flat list. The meaning of the individual 'information objects' is not standardized.
- OPC DA
  Widely used standard from industrial automation that is also frequently used in the field of energy technology.
- OPC UA
  The latest specifications of the OPC Foundation which are ideal for applications in energy technology due to their flexibility and the many requirements covered.
- Modbus TCP
  Frequently used and very simple protocol. It continues to be used for network and data transmission in spite of the lack of quality information and time stamps.

IMPRINT

Publisher
Bachmann electronic GmbH
Kreuzäckerweg 33,
6800 Feldkirch, Austria
www.bachmann.info

Responsible for the content
Frank Spelter (v. i. S. d. P.)

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