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The Magazine for Totally Integrated Automation

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SIEMENS

Focus
Siemens China

A success story that has been continuing for 140 years

Drive Technology
Strong Partners on the Road to Success

Siemens becomes strategic partner of Oerlikon

Industrial Identification
Reliable Identification through Wireless Communication

Dependable for environments that are difficult for radio transmission

Successful Energy Management

Transparency encourages power saving



In Brief

News 4

Focus

Connecting Productivity and Efficiency 5

Products and solutions for the production process at Hannover Messe

Well Equipped to Meet the Challenges of the Market 6

Interview with Prof. Dr. Siegfried Russwurm

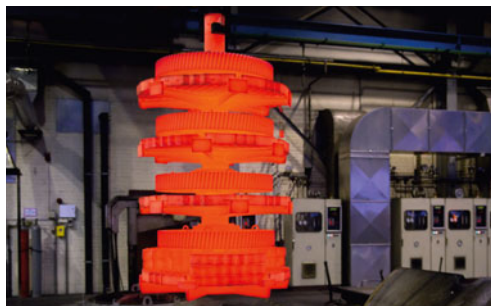
Siemens China 8

Examples of cooperation on a partnership basis of Siemens and Chinese industrial enterprises

Automation Technology

Transparency Encourages Power Savings 12

Sustainable production in the gear manufacturing plant in Penig



The power-intensive production of torque-transmitting components requires efficient energy management

HTML meets PLC 16

Integrated web servers score in fully automated plants that are dispersed

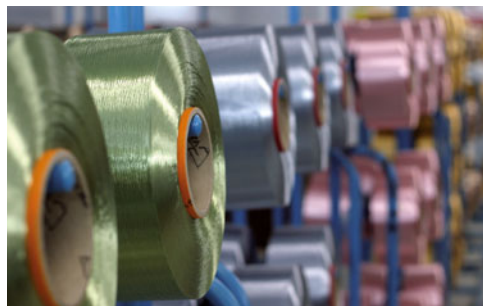
Robust Technology Secures Availability 17

Simatic HMI IPCs help to avoid errors during assembly

Drive Technology

Strong Partners on the Road to Success 18

Partnership Awards presented to textile machine group Oerlikon



The expertise required for WINGS (Winding Integrated Godet Solutions) is a distinguishing characteristic of Oerlikon

Hot Rolls 20

Innovative drive solutions for hot-rolling mill in Brazil

Greater Energy Efficiency in the Drive Chain 22

High potential for savings through optimization of the drive system

Safety Technology

Perfect Interaction of Standard and Safety Technology 24

Integrated safety increases productivity of plants

Safely Packed 26

Comfort, productivity, and safety with drive-based functions

In Chinese undergrounds,
sliding door systems
ensure greater safety



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Industrial Switching Technology

Efficiency Can Be Planned 28

Find the right product with
„Planning Efficiency“

The Plus Factor for Specific Requirements 30

Siplus products offer high degree of
reliability, functionality, and flexibility

Industrial Identification

Reliable Identification through Wireless Communication 32

Dependable for environments that are
difficult for radio transmission



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UHF RFID systems ensure consistently high quality –
from the first processing step to shipping

Industrial Communication

Safe and Reliable with Wireless 34

Pump manufacturer uses IWLAN in its
distribution warehouse

Customer Support

Efficient Plant Monitoring 36

Detect problems in plants
early on with web-based condition
monitoring system

Dialogue

Sitop Selection Tool/Sitrain 38

Compliance/mowo App/ Events/Dialogue 39

advance 2-2012

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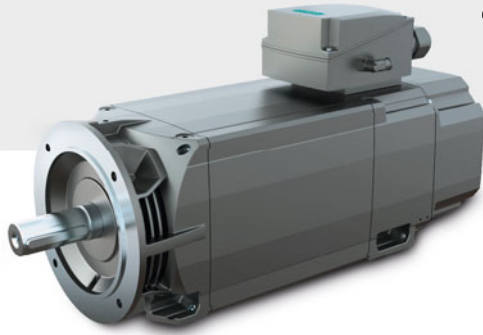
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The Simotics M-1PH8 main motor impresses with its excellent design



+ Simotics M-1PH8 main motor wins 2012 iF design award

Outstanding Design

For almost six decades, the coveted iF design awards have been honoring outstanding design efforts in the areas of product, communication, and packaging. The award winners in the product area impress not only through technical details but also through their excellent design. This year, the Simotics M-1PH8 motor was awarded the iF quality label, which is recognized worldwide. The 1PH8 line has been designed for universal use in a wide array of motion control applications. Based on a flexible modular design, the main motors are available in both an asynchronous version and a compact synchronous version and with forced ventilation or water cooling. They are available as main drives with capacities of 2.8 kW up to 1,340 kW. Together with the Sinamics S drive system, they can be used as main drives in almost all applications.

www.siemens.com/simotics

+ Sirius 3RB24 electronic overload relay for IO-Link

Product of the Year

Excellent protection: The Sirius 3RB24 electronic overload relay for IO-Link has been named Product of the Year 2011 by the renowned American print and online magazine *Plant Engineering*. The communication-capable Sirius 3RB24 overload relay offers uninterrupted motor protection for high-feature applications and enables the connection of fuseless load feeders to the higher-level control system, providing many communication benefits. Reading current values, diagnostics, and locally set parameters increases plant availability and simplifies plant documentation. Transmitting analog process values such as currents makes the optimization of plant processes easier. And together with contactors, the overload relay can also be used as a direct starter, reversing starter, or star-delta starter.



The Sirius 3RB24 electronic overload relay for IO-Link offers multiple communication benefits

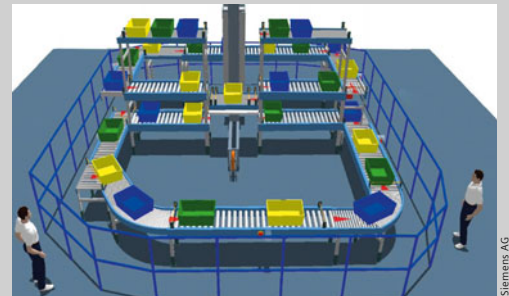
www.siemens.com/io-link

+ New trade fair model

Systematic Logistics

A new trade fair model that could also be seen at Hannover Messe illustrates the efficient and safe automation of logistics processes. It consists of three levels, two of which serve to transport containers while the third serves as storage space for containers that are no longer needed or for sorting. There are several sequences to choose from on a panel PC.

With the Simatic RF600 RFID system, the various containers are identified and sorted. Enclosed in the containers are dispatch notes with data matrix codes (DMCs), which can be



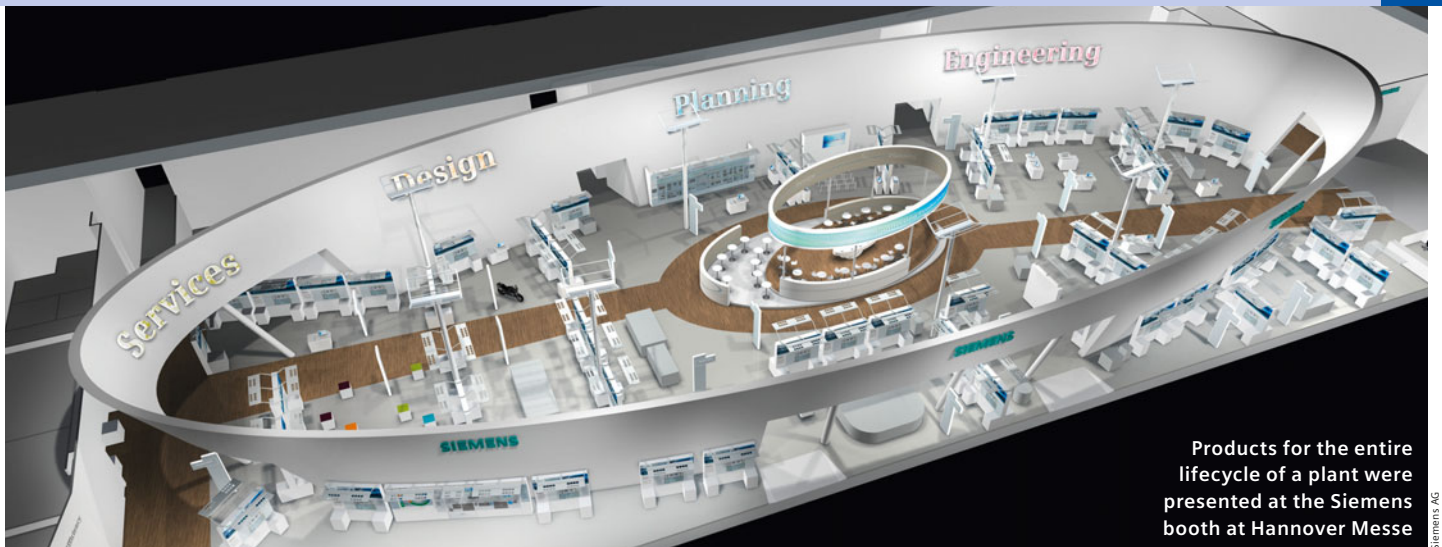
The logistics model shows what is possible today

read with the Simatic MV440 code-reading system. The camera image of the code-reading system is displayed on a Simatic HMI IPC477C PRO 15" panel PC, from which the complete plant can be displayed and operated using Simatic WinCC. An F-IWLAN mobile panel with an emergency stop switch for the plant and an MP277 10" Touch Multi Panel are also used. The conveyor system elements are driven by the new Simogear geared motors, which are in some cases operated at the Sinamics G120D inverter and in other cases at the Sirius M200D motor starter.

The new Sinamics G120D, with integrated positioning functionality (EPoS), is used with the single pylon lifter. In this process, the position is registered using a laser distance-measuring system that is connected directly to the G120D. The speed is recorded via the HTL sensor of the Simogear geared motor, which is also operated directly on the G120D. In addition, the energy generated through the downward motion of the lifter is fed back into the grid through the Sinamics G120D. The signals of the emergency stop switch directly on the model and the safety door are collected via AS-i and transmitted via a DP/AS-i F link to the fail-safe Simatic S7-300 CPU 317F-2 PN/DP. The fenced-in installation can be restarted only once the malfunction has been acknowledged and eliminated.

www.siemens.com/conveyor-technology

Connecting Productivity and Efficiency



Products for the entire lifecycle of a plant were presented at the Siemens booth at Hannover Messe

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With greater interconnectivity in their production processes, industrial companies can use previously untapped potential to increase productivity and efficiency. At Hannover Messe, under the slogan “Connecting productivity and efficiency,” Siemens showed how ambitious economic and ecological goals can be achieved using intelligent and integrated products and solutions for the entire production process.

While touring booth A72 in hall 9, visitors were able to experience Siemens’ comprehensive technological portfolio for the entire product and plant lifecycle: from innovative systems and solutions for the product design and planning phases to engineering and manufacturing operations to maintenance and modernization. Thanks to perfectly integrated solutions in automation technology, industrial switching, and plant technologies, as well as industrial software and services, users were presented with savings and improvement potential throughout the entire value-added chain.

Perfectly integrated solutions – from plant design and operation ...

A prime example of an integrated solution demonstrated in Hannover is the Totally Integrated Automation (TIA) Portal, with which a company can process all engineering tasks in automation and drive technology using just one software program. This reduces the engineering effort by up to 25 percent.

True to the Hannover theme of “Greentelligence,” which connects economics and ecology, Siemens has developed products that offer customers extra energy savings. For example, Sinamics converters or the new Simogear line of geared motors can be included in the design of the customer’s plant to increase efficiency. This new line offers efficiencies of up to 98 percent and a higher torque than competitors’ products of the same size.

Other innovations presented at the fair also contribute to energy savings and cost reductions. For example, in the area of industrial identification, the UHF RFID reader has now been further optimized for reliable use in demanding applications and difficult environments for radio transmission. Furthermore, there is a new version of the Simatic B.Data energy management system available, with which technical and commercial data processing systems can be connected, and which creates company-wide transparency of all systems that generate or consume power. The Simocode pro motor management system with a Profinet link also supports efficiency im-

provements, thanks to the implementation of Profienergy functionality.

... to service and support

Siemens supports companies with need-based service solutions during planning, construction, and operation as well as the modernization of plants. For example, Simatic remote support services make support more economical and more flexible for the user. And there are targeted measures for the optimization of existing or planned plants and processes, for example, for the use of resources. This way, customers’ long-term productivity and efficiency – and thus competitiveness – can be increased throughout the entire value-added process. +

MORE ON THIS TOPIC:

+ www.siemens.com/hannovermesse

Well Equipped to Meet the Challenges of the Market

Rising energy prices, stringent requirements for environmental protection, and shorter development times are causing modern industrial enterprises to look even harder for solutions that increase both productivity and efficiency. To find out what answers Siemens has to these challenges, we spoke with Prof. Dr. Siegfried Russwurm, CEO of Siemens Industry.

Prof. Russwurm, Siemens' motto at this year's Hannover Messe is „Connecting productivity and efficiency.“ What promise to our customers does that motto reflect?

Prof. Siegfried Russwurm: To stay competitive on an international scale, our customers have to continuously increase their productivity while also operating more sustainably than ever. Not least due

to rising prices for energy and raw materials, there is now a fundamental connection between profitable solutions on the one hand and energy-efficient and ecological solutions on the other. That's why we have focused our portfolio on connecting productivity with energy and resource efficiency. At the same time, to increase productivity, we build on the entire value chain: from product design

to production planning, production engineering, production execution, and on to service. The richest potential can no longer be tapped using stand-alone island solutions. Our customers need the seamless integration of information, communications, and automation technologies in all their operating processes. And that is only possible with innovative IT and software solutions.

„To offer customers the best products and solutions, you first have to have a deep understanding of the processes and technologies typical of the individual vertical markets.“

Prof. Dr. Siegfried Russwurm, CEO of Siemens Industry



Why do you think it's so important to focus on vertical markets?

Russwurm: More and more, our customers want end-to-end solutions tailored to their specific market from a single source. To offer customers the best products and solutions, you first have to have a deep understanding of the processes and technologies typical of the individual vertical markets. And we have that. We don't just speak our customers' language – we speak their dialect, too. We put this expertise to work to identify and tap improvement potential for our customers. That helps businesses respond even better to new market demands and developments and enhance their competitiveness.

Siemens has identified many growing vertical markets for attention and optimized sales responsibilities. The contacts for customers are clearly defined – from Automotive to Wind. Our people responsible for a vertical market have outstanding expertise in that market and can also call on a wide-ranging network of experts and the company's full portfolio. As a result, we can always adjust our products, solutions, and services perfectly for the needs of the individual vertical market and the individual customer.

Does that mean a withdrawal from standard products business?

Russwurm: No, not at all. This vertical-market focus is an additional element of our sales strategy. The customer is always at the center of our focus – regardless of whether that customer is part of a particular vertical market or not. Standard products business through a classic broad-based sales presence or via sales and solutions partners continues to be very important.

Siemens works with many external partners. Given that, how is the new service unit at Siemens Industry, Customer Services, positioning itself?

Russwurm: Our service business is steadily growing in importance because our customers are investing more and more in the continuous improvement and targeted modernization of their plants rather than in new construction. The only way to be a comprehensive partner for our customers is to go beyond offering a coordinated portfolio of products and solutions – and also supply real customer care over the entire lifecycle of their plants from a single source.

That's why we bundled our service competencies along all vertical-market activities and technologies in a single service unit, Customer Services, which – with about 17,500 service experts – offers vertical and service solutions across Division boundaries. That includes standard services such as retrofitting and maintenance, for example, but also value-added services such as energy consulting, condition monitoring and end-to-end plant management.

But forming Customer Services doesn't mean that we are going to do without expertise from outside of Siemens. We will continue to work with external partners for special services that we don't have in our own portfolio, for example, or in cases where we are convinced that our partner can perform the right service more efficiently and thus at a better price than we can.

The Partner Country at this year's Hannover Messe is the People's Republic of China, a country in which

Siemens has operated successfully for many years. How will this success story continue?

Russwurm: Siemens has had a presence in China for about 140 years now and has become an integral part of the Chinese economy over the years. Today, with 29,000 employees there, we are one of the biggest foreign employers in the country.

Our goal for the future is clear: we want to participate in the economic development of China and the other emerging markets and achieve market leadership as well as innovation leadership there. To do that, a strong local presence is key. That's why we are now building an electronics factory in Chengdu, for example, where beginning in 2013 Simatic control systems and automation components will be developed and manufactured. The model for this is the plant in Amberg, where development work and production are completely networked with each other.

But that's not all. Successful market penetration is only possible with SMART products (Simple, Maintenance-friendly, Affordable, Reliable, Timely-to-market) tailored for this market that are also developed and produced locally. That's because you have to be locally present in a market to understand what product characteristics are particularly important for that market.

Examples of such SMART products are the Sinumerik 828D Basic and the Simatic Smart Line HMI, which have been very successful in the Chinese market.

Prof. Russwurm, thank you for this interesting interview.



Siemens China

Having done business in China since 1872, Siemens has become a reliable, committed, and trustworthy partner to the country and, with a workforce of about 30,000, one of its largest foreign employers.

Siemens holds leading positions in the industry, energy, and healthcare sectors. The Industry Automation and Drive Technologies divisions of Siemens' Industry Sector China alone comprise 18 operating companies and more than 60 regional offices with a total of 13,000 employees, providing Chinese customers with the latest reliable and highly efficient automation and drive technology and comprehensive service.

These companies span almost the entire range of industries, from the iron and steel industries and mechanical engineering to food and beverages and the chemical, automotive, and space travel industries. Recent successes in the Industry Sector include a turnkey assembly-shop project for an automotive plant, which involved machines and electrical systems, and a contract for the supply of geared motors for the shore bridge project in Rizhao Harbor, in the province of Shandong.

Regional partners are important

In all its projects Siemens collaborates with regional Chinese partners. The Solution Partner Program currently has 50 Chinese systems integrators as members, including about 10 specialists in the Simatic HMI human-machine interface and Simatic PCS 7 process control system technologies. Drives and motion control continue to be particular focal points in China. Siemens also plans to expand its business with Solution Partners in the various industries. Siemens offers special training to help its partners build and expand their expertise. Equally important is the regular know-how transfer between Siemens and the Solution Partners.

The partners in China can be located via the Solution Partner Finder:

www.siemens.com/automation/partnerfinder





The 35 t steel coils are transported along an 800 m circular track system by 12 driverless vehicles

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Reliable radio communication

At the new plant of a well-known Chinese steel manufacturer, a driverless transport system ensures the smooth flow of material between the hot strip mill, the three cold rolling mills, and the flat store. Integrated and innovative automation technology provides highly available, fast, and secure data transmission to and from the vehicles, which move along a circular track system. A wireless radio network with RCoax antenna technology also supports Profisafe for the fail-safe components.

A Simatic S7-400 controller with CPU416-2DP distributes the tasks to the empty vehicles. The determination of vehicle positions and the actual transport logic are distributed symmetrically among two further Simatic S7-400F controllers of the type 416F-3 PN/DP that are linked via master/slave communication. Three SCADA systems based on the client/server principle provide process visualization and flexible means of manual intervention.

iPCF-capable Scalance W784-1RR access points in combination with RCoax leaky wave conductors from the Simatic NET product line establish an exactly defined radio field along the tracks. The iPCF procedure ensures seamless transitions as the vehicle passes between the radio access points.

The control cabinets on the vehicles are equipped with Sinamics converters that perform safety-related functions such as Safe Stop (SS1) via Profisafe and Safety Integrated. ET 200 components provide decentralized communication with the onboard fail-safe inputs and outputs. The use of the ET 200eco standard and fail-safe modules in the stationary line further emphasizes the full integration from sensor to actuator.



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When the platform is crowded, the metro door system prevents passengers from falling onto the track bed

Sliding doors for greater safety

Renmin Square in Shanghai is one of the most frequented metro stations in China and therefore has a high risk of accident. Since the 2010 Expo, a reliable electronic sliding door system has prevented line 2 passengers from falling off an overcrowded platform and onto the track bed.

Based on its experience in elevator door control, Siemens developed the AT-EB controller and the AT18S drive for this metro door system. With these components, in combination with the Simatic S7-400H redundant control system and the Simatic WinCC software, the Shanghai Metro Operation Co., Ltd., has an integrated, modular automation solution at its disposal. The customer developed its own system on this platform to minimize the costs for the adaptation to local conditions and maintenance.

To enable independent control of the sliding doors, each door has its own control unit consisting of an AT-EB controller and two AT18S drives. The control unit also serves as a Profibus DP slave, which is connected to the higher-level Simatic S7-400H, which is thus able to monitor the operation of all sliding doors and to read their operating parameters. The door control units provide important safety functions such as automatic reopening, infrared obstacle detection, and manual emergency unlock.

Thanks to the open Totally Integrated Automation (TIA) platform, communication between the sliding doors and the other metro systems works smoothly.

Efficient manufacturing

The plant of a well-known automobile manufacturer in Chengdu, western China, is set to produce 350,000 sedans a year. To achieve its long-term strategy, the company needed, among other things, an assembly line produced in accordance with its worldwide technical standards that was capable of completing 60 orders per hour – twice as many as is common in Chinese assembly lines.

As a technology partner, Siemens provided the plant with tailor-made automation solutions incorporating control systems, safety products, and the Profinet communication protocol. To enable the plant to achieve the intended production rate while producing high-quality products, Siemens developed an automatic fastening system with numerical positioning that ensures the exact and rapid assembly of the components. The assembly station supports strict quality assurance at every stage of production.



In the engine assembly line, Solutions for Powertrain – Transline is used. This standardized modular solution greatly improves the capacity of machines and equipment, increases reliability, reduces maintenance and repair times, and reduces project costs. Transline also ensures an early start of production and better scalability.

At the Chengdu plant, Siemens has successfully implemented its “Made in China, German Quality” localization strategy, saving a great deal of time and reducing the customer’s costs in the process. As a partner, Siemens knows the standards that have been introduced to ensure efficient production in Chengdu, too. Siemens installed its control solution for the engine assembly line in the manufacturer’s German plants as well as in Chengdu.



All eyes were on this gigantic fountain in the shape of a ship at the opening ceremony of the Asian Games

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High-tech fountain

Almost 10,000 athletes from 45 Asian countries participated in the 2010 Asian Games in Guangzhou in southern China. A ship-shaped fountain more than 200 m long, 130 m wide, and 40 m high, with almost 220 spray nozzles, played a key role at the lavish opening ceremony on the island of Haixinsha. The complex combination of numerous fountain sprays, interaction with the performers, and rapid and precise musical cues were special challenges for the fountain controls. Of all the bidders, Siemens was best suited to meet the requirements of the project with its integrated and efficient automation system.

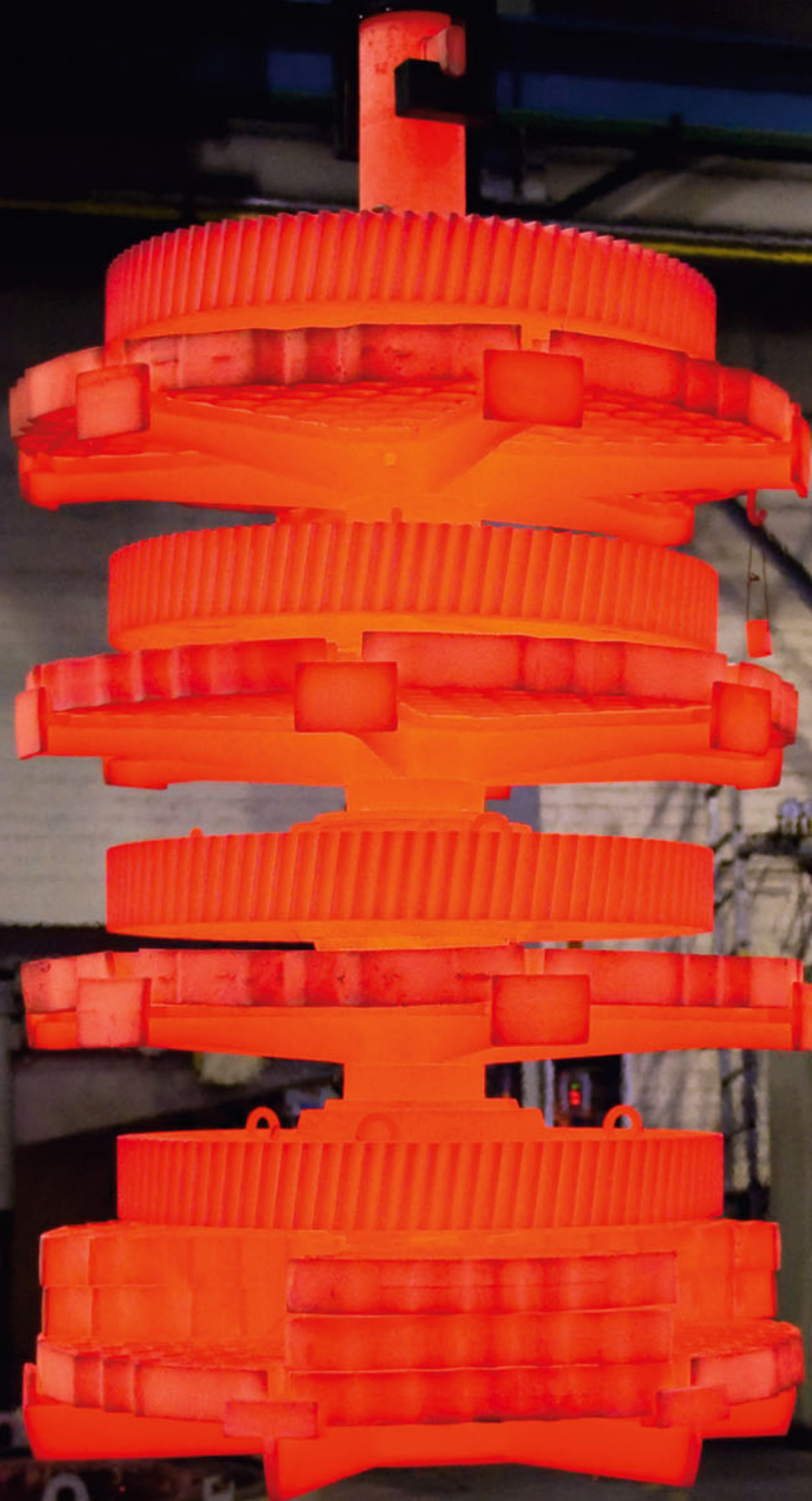
A Simatic S7-417-H redundant controller with a processor speed of 18 ns was used; its storage capacity of 30 MB can be increased by 64 MB. With its patented event synchronization, the controller guarantees the highest degree of availability. Profibus DP is used to control the sensors and actuators, and Simatic WinCC V7.0 is used for visualization. Various operator stations are connected to the engineering station. The system controls, among other things, 1,200 water pumps, underwater lighting, fire-breathing dragons, and 375 electric machines communicating via UDP protocol. All the controls take up a total of 22 machine housings in eight rooms and are connected via Profibus DP and fiber-optic cable.

MORE ON THIS TOPIC:

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- + www.industry.siemens.com.cn



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The gear wheels are tempered at 1,200°C and then quenched in oil baths

Transparency Encourages Power Savings

The production of torque-transmission gear wheels and components or spur gears and accessory shafts is extremely power intensive. To ensure more cost-effective and sustainable production, the Siemens gear manufacturing plant in Penig near Chemnitz, Germany, recently introduced a power management system. A number of advantages can already be seen.

At its plant in Penig, Siemens produces gears for industrial applications and rail transmissions. Siemens is one of the world's leading companies in this field. Its customer base includes OEMs and industrial customers as well as all the major railway vehicle manufacturers in Europe and some in Asia. Railway drives from Penig are successfully deployed on every continent around the globe. The component manufacturing facility produces up to 600 torque-transmission parts every day. These are turned, milled, hardened, and polished in the finishing department or during the hardening work. The share of production costs attributable to power consumption is extremely high. With the B.Data power management system, Siemens wants to reduce power consumption during production.

Creating awareness

Dirk Jürgens, head of Business Subsystem, explains his decision to adopt B.Data: "It has been shown that in private homes, it

is possible to save up to 10 to 15 percent by means of a committed approach to power. Knowledge of genuine savings possibilities is crucial. Only when users know what no-load losses, such as stand-by mode on the television, actually cost do they have an incentive to do something." Jürgens is convinced that the savings potential in the industrial sector is just as high. "Naturally, we are aware that the software doesn't automatically reduce consumption; the processes must be adapted first. In the numerous manual steps in our production process, employees can contribute a great deal to power savings. But we need to encourage them with clear messages. As long as it is not yet known whether it is worth switching off a machine during break periods for power reasons, employees will prefer to leave it on. However, if every individual is aware of the actual savings potential at his or her workplace, everyone will have an incentive to make this contribution as well," the technical manager is convinced.

Optimizing the scope for decision making in total safety

In this case, the B.Data software creates maximum transparency. If the electricity consumption of individual machines were correlated to the operating status of each machine, it would be possible to determine exactly how much the process of switching on and off for breaks contributes to consumption and what the savings potential is by switching off. The hardening shop is particularly power intensive. Here, the parts are tempered for several hours at a temperature of up to 800°C. Afterward they are quenched in oil baths. The hardening process is set by means of a program, but because the oven is loaded and the parts are dipped in oil by hand, the operator still has some scope for decision making. For example, after the hardening process, the oil is still too warm for the subsequent quenching process. Should it be cooled further, or should it be left to cool down itself? Until now, these decisions have been made by experienced ►



"The high level of transparency provided by B.Data promotes a sense of responsibility among our employees, as they can make a tangible contribution to the company's energy balance."

Dirk Jürgens, Head, Business Subsystem, Siemens Industrial Gears



For the power-consuming process of hardening gear wheels, energy management tools like B.Data can contribute to a positive energy balance of the company

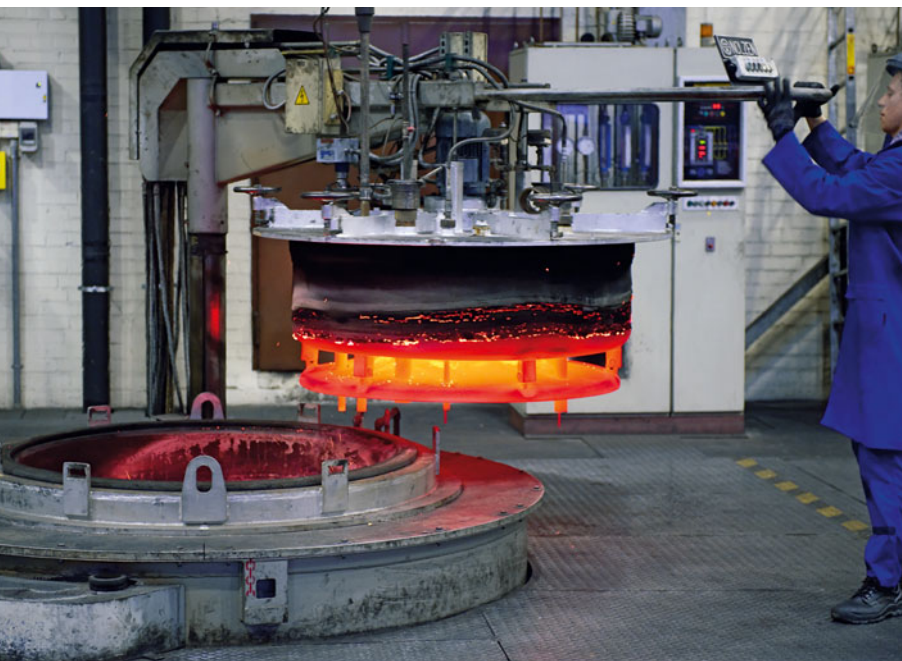


► employees according to their best knowledge. With the extremely high power costs at present, an optimization based on exact consumption data is the aim. "Transparency instead of general appeals also works as an incentive here," Jürgens emphasizes. "It is already becoming noticeable, although we are still in the phase of measuring the consumption of individual machines before taking the next step toward identifying power-savings potential."

All media are important

B.Data incorporates all forms of power. For example, PAC 3200 measuring devices monitor the consumption of expensive compressed air. In the Siemens gear manufacturing plant, two compressors feed a closed circular pipeline to which 130 machine tools and assembly stations are connected. This compressed air system runs at 6 bar, raising the question of whether the high pressure is really universally necessary or if it is overestimated as a precaution. B.Data facilitates analyses concerning leakages and leakage costs. It also determines exact consumption, thereby making it possible to reduce the pressure without risk to the availability of the machine. Even small adjustments can lead to clear savings. Because in general only 4 percent of electrical power can be used as compressed air power when producing compressed air, efficiency monitoring of the air compressors is also an import cost factor. That is why, when producing compressed air, the volume of compressed air (Nm^3) is compared with the required electrical power by means of a pulse count on the power-measuring device. The key performance indicator (KPI) established (kWh/Nm^3) indicates the efficiency of the air compressors.

The power and media consumption are automatically calculated and sent by e-mail to the units concerned. This situation



analysis facilitates progress control with regard to power savings. Using a number of efficiency KPIs, the production process can be evaluated in terms of its power efficiency. For example, the categories "good," "medium," and "bad" provide a quick idea of the possible optimization potential for power efficiency in the production of compressed air.

Optimization reduces costs

With B.Data, the oversizing of power distribution can be avoided, as the system constantly monitors consumption at the individual power feeders. This is a clear advantage over conventional measuring instruments, which provide only snapshots. The measurements showed that the load on the distributors in the production plant varies considerably: many wires are oversized, while others are almost at their performance limit. "To prevent disturbances resulting from an overload, we place all power distributors on the same level. The rewiring costs are very low compared to the positive contribution to the increased availability of the machines," explains Jürgens.

Power prices consist of the costs for the agreed normal load and the costs for peak loads. Using only the temporal recordings of the total power consumption, B.Data was able to demonstrate a means of reducing costs. It was therefore determined that it would be more favorable at the current tariff to agree to a higher peak load (4.5 instead of 4.2 MW), and this has already paid off.

Because industrial companies and car manufacturers are increasingly trying to reduce the environmental damage caused by their plants, sustainability is no longer just a sales argument – it also offers tax advantages. Evidence must nevertheless be provided that measures have been taken to minimize power consumption

and CO₂ emissions. Suppliers that can already demonstrate the sustainability of their production processes are a step ahead. But according to Jürgens, being able to determine the real power-cost share of different parts has another advantage: "Previously, we used the same share as the basis for setting the prices of all parts. A transparent price-setting mechanism based on real costs promotes a partnership-oriented customer relationship."

Project expansion in view

While the extent of actual power savings in component production is still unclear, Jürgens is nevertheless firmly convinced that the percentage value is in double digits. In addition to the financial aspects, he also feels that employee motivation is important. "If savings potential can be supported by precise figures, everyone pulls in the same direction. The high level of transparency provided by B.Data encourages our employees to develop a greater sense of responsibility because they can make a tangible contribution to the company's energy balance."

In a further project stage, the Siemens gear manufacturing plant intends to introduce a connection with ePS, the condition-monitoring solution for machine tools. Insights from power management and

condition monitoring come together in maintenance. Valuable synergies can be derived from a combined vision. In real terms, the automatic correlation of a machine's operational status and power consumption is expected to provide information concerning process optimization and machine maintenance. It is clear to all those in charge that reduced power consumption and increased availability and productivity are ambitious goals that can nonetheless realistically be achieved with the help of B.Data and ePS. +



Expertise in power management

The B.Data power management system was implemented by Siemens Professional Services Energy Management in Linz, Austria. Taking account of various projects, project leader Gottfried Blumauer notes that achieving power savings of 10 percent through awareness training and subsequent efficiency measures is realistic: "B.Data, together with the flexible PAC measuring devices, creates the necessary power transparency. Power costs are ascribed to the units that 'generate' them. Only in this way can power efficiency be increased across all departments."

MORE ON THIS TOPIC:

- + www.siemens.com/bdata
- + www.siemens.com/sinumerik/eps

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HTML meets PLC

Web pages on the CPU are an inexpensive option for plant diagnostics and telemonitoring and are becoming increasingly attractive with the growing popularity of mobile devices such as smartphones and tablet PCs. In fully automated plants that are spread out over large distances, where only a few parameters need to be displayed or adjusted occasionally, these devices can even replace on-site operator panels.

Web pages on the CPU can prove useful if one-time or infrequent reading or adjustment of only a few parameters is needed – whether during the commissioning of series machines for the one-time set-up of an IP address or during maintenance measures for temporary access to plant status, for adjusting the configuration, or for carrying out plant self-tests.

Efficient diagnostics from any browser

Simatic controllers with Profinet interfaces have an integrated web server that includes web pages to display diagnostic data. With this server, it is possible to query and save firmware statuses, diagnostics buffers, variable tables, and module groups; monitor communication links; and display the topology of the plant. In case of a malfunction, the user can view the exact error message in plain-language text in the detail view of the module.

All that is necessary to be able to use this functionality is to activate the web server in the hardware properties of the CPU. The available standard web pages can be supplemented by any number of freely structured additional pages created with standard HTML editors such as Dreamweaver, Expression, or Notepad. Calling the web pages is possible from any standard Internet browser and from any PC or mobile device; for security reasons, the web server must be actively enabled. To prevent unauthorized access, it is also possible to issue user rights. To ensure

higher IT security during transmission, Hypertext Transfer Protocol Secure (HTTPS) is supported, which encrypts the data and transmits them securely.

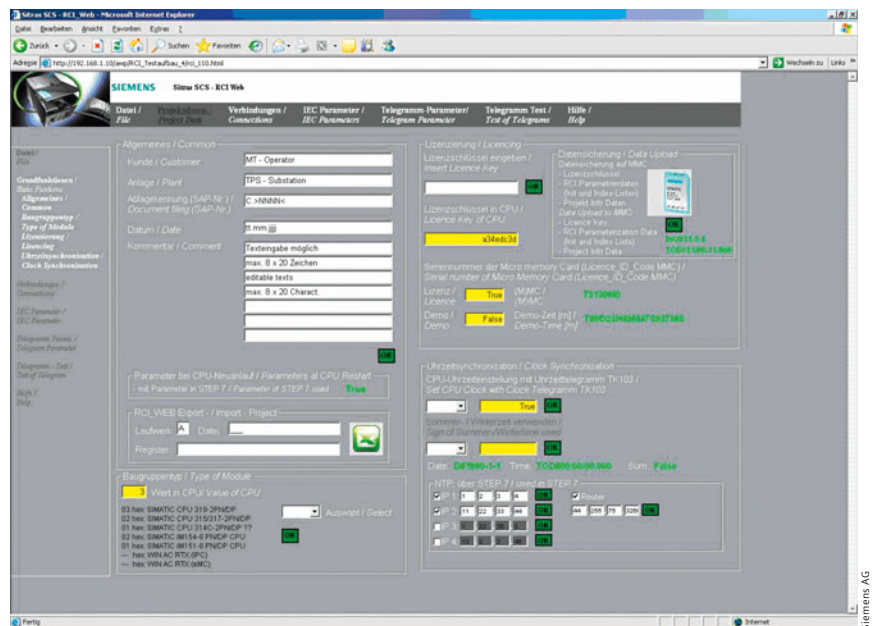
Positive experiences in a wide variety of areas

A typical example of an application for which practical experience already exists is solar farms with automated tracking mechanisms for the solar panels. In case of extensions, completed web pages can be copied and directly integrated, making them immediately available. Another proj-

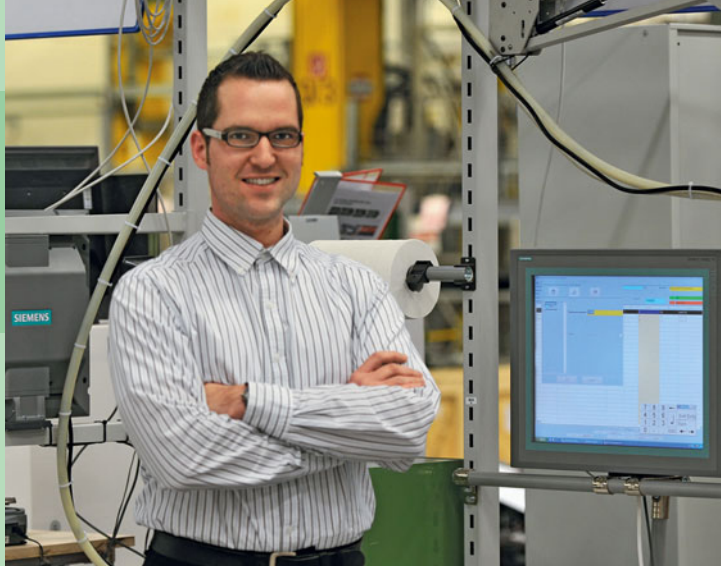
ect that has already been realized successfully with technology that can be applied to many plants deals with the monitoring of voltage-limitation devices for direct current railway facilities. The challenge here, too, is the requirement for experts to be able to monitor – from any location – plants that are physically distributed over large distances.

Fast start

For a fast start, a Step 7 project with corresponding HTML files and documentation is available for download free of charge at



Example of a user-defined web page to display diagnostic data



Philipp Eigel, Project Leader, Power Transmission

Robust Technology Secures Availability

<http://support.automation.siemens.com/WW/view/en/44212999>. In addition, Sitrain offers a course that discusses the requirements for the implementation of user-oriented web pages and allows participants to practice setting up web pages that are connected to a PLC (information available at www.siemens.com/sitrain). +

IT security note

Suitable protective measures (including IT security, e.g., network segmentation) must be taken to ensure secure operation of the plant. Further information on industrial security can be found at www.siemens.com/industrialsecurity.

MORE ON THIS TOPIC:

+ www.siemens.com/simatic-controller

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For low-loss transmission to the mainland, the rotary current produced by offshore wind farms is converted first to direct current on an offshore converter platform. A further converter station then converts it from direct to alternating current for further transmission and distribution. At the heart of the converter stations are the actual converters, IGBT modules produced by Siemens Energy in Nuremberg.

The assembly of these modules is extremely challenging due to the number and complexity of the components. "We can't afford any assembly errors due to the high availability requirements of the farms," explains project leader Philipp Eigel. "That's why we use every software-based option to minimize this risk."

Each assembly area is equipped with a Simatic HMI IPC477C pro with a 19" screen that clearly displays the individual production steps. Only after the completed steps are logged into the industrial PC (IPC) is the next station cleared. Particularly important test steps require clearance to be granted by more than one person. In addition, bar codes and measuring values are read automatically so that it is always possible to trace which batch and supplier the individual components were from and where and when they were installed and by whom. Project leader Eigel says, "The software's availability at the line is our highest priority. With

the Simatic HMI IPC477C pro we have a robust IPC with all-round IP65 protection that is easy to install and allows for fast and flexible mounting on horizontal or vertical surfaces as well as on support arms." Apart from a power cable and an Ethernet connection to the higher-level data server, no wiring is needed.

There are currently 20 identical IPCs in use in Nuremberg. For Eigel, they were the right decision for future-proof quality: "Even if our IPCs are exposed to only minimal dust and no liquids, the comprehensive protection and the increased stability resulting from fanless operation are still important to us. Because with alterations, for example, in new lines, we need to be able to rely on the availability 100 percent." +

MORE ON THIS TOPIC:

+ www.siemens.com/simatic-ipc

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Strong Partners on the Road to Success

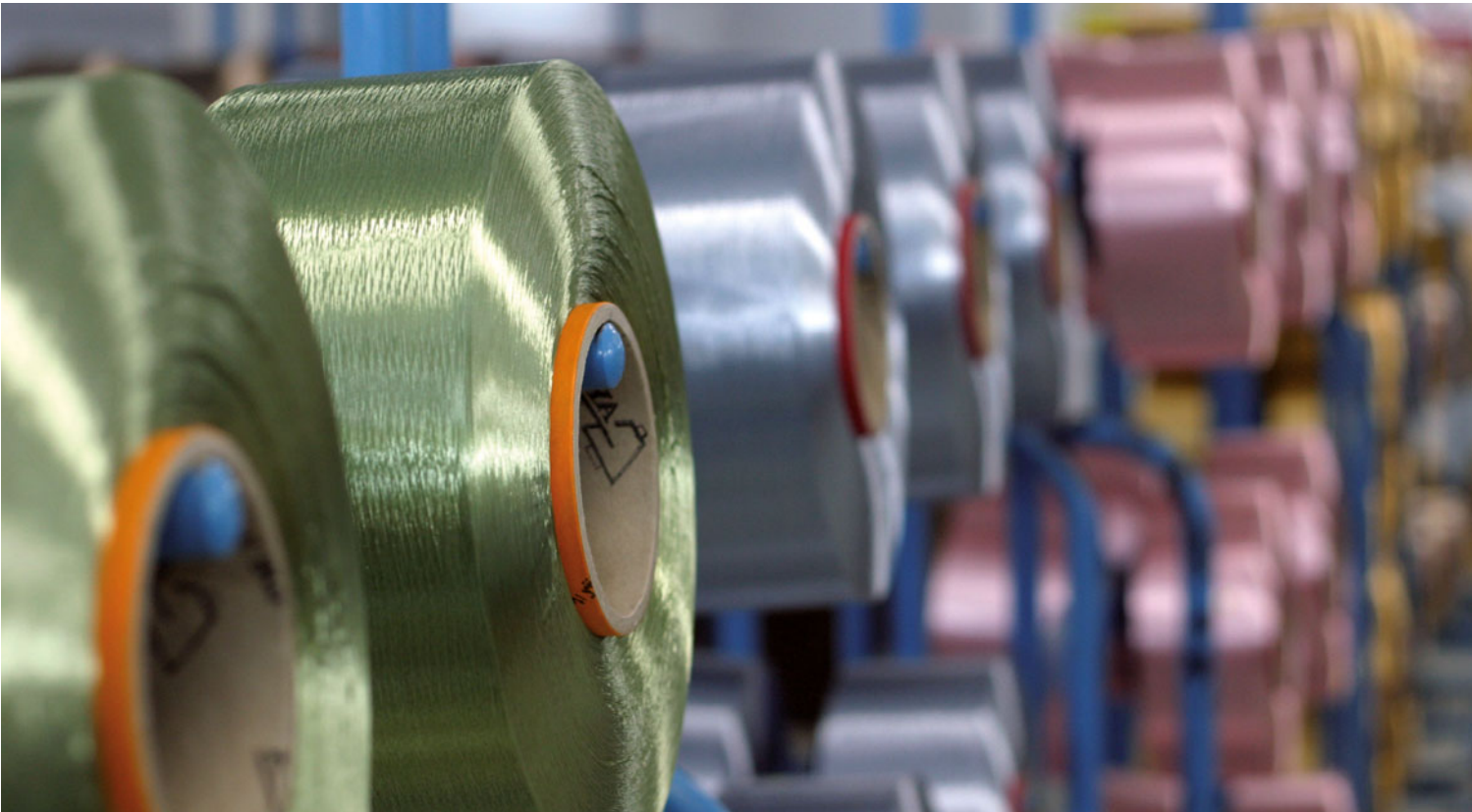
Oerlikon and Siemens, both global leaders in technology, have developed a close and successful partnership, in particular in the field of textile machine and plant construction. Starting off as a simple product supplier, Siemens has since become a valuable strategic partner – a fact underlined by Oerlikon's presentation of a partnership award to Siemens in the supplier-integration category.

The Swiss group Oerlikon develops various turnkey solutions for solar modules made from thin-layer silicon, protective coatings for precision tools and components, vacuum generation and process gas conveyance systems, textile machines and plants, and drive technology. The company is also in-

involved in aerospace technology and production systems for nanotechnology applications.

Oerlikon's business relations with Siemens are long-standing: from a simple product supplier for motors and controls, Siemens has developed into a strategic global partner playing an essential

role in the processes in place at Oerlikon. The collaboration is particularly strong with the two business units in the textiles segment – Oerlikon Barmag, specializing in filament yarn plants and texturing systems, and Oerlikon Neumag, the equivalent for staple fiber, nonwovens, and carpet yarn plants.





Werner-Wilhelm Bleidorn, global key account manager at Oerlikon at Siemens Cologne (fifth from right), and Markus Zolg, branch sales department manager at Siemens Erlangen (second from right), accepted the Oerlikon Partnership Award 2011 on behalf of all those who contributed to this success story

Expertise for "WINGS"

Siemens' product and solution expertise is one of the keys to the global success of the WINGS concept:

- + Customer-specific Simotion D425 for the complex technological functions of a high-performance winding head
- + Customer-specific Sinamics S120 for driving cost-effective special motors
- + Simatic WinCC SCADA system as a central data collector
- + Modified high-efficiency standard induction motors for maximum engine-speed strength and vibration quality
- + Development of customer-specific modules
- + Optimized control cabinet construction in the Chemnitz Werk für Kombinationstechnik plant (WKC)
- + Demand-based on-time delivery in the Oerlikon Barmag production facility
- + Regular workshops concerning continuous improvement of the existing solutions

Integrated concept for winding machine

In 2000, Oerlikon Neumag abandoned its original automation concept with different suppliers and implemented the first integrated production concept based on the core components of Simatic S7-400, Simatic WinCC, converters for the Master-drives series, and Siemens motors. Beginning in 2004, the groups worked together to develop an entirely new integrated control, drive, and networking concept for the WINGS POY winding machine for partly oriented yarn (POY), currently the leading technological solution worldwide. WINGS (Winding INtegrated Godet Solution) represents an innovative approach that develops new possibilities for even more efficient and economical POY production.

To remain competitive, some tailor-made and some modified standard products were adopted in implementing the current WINGS POY system. In this way, Siemens and Oerlikon developed customer-specific modules in numerous projects, including an optimized input/output module, an intermediate circuit precharge, and an excess rotation speed control. The Sinamics S120 modular drives were also issued in a special Oerlikon format. At the same time, the Siemens Chemnitz Werk für Kombinationstechnik plant (WKC) optimized the design and production of the series control cabinets. The results are the extensive pre-cabling of modules and their demand-driven, synchronous supply in control cabinet assembly. For specific components, Siemens

developed individual quick-assembly ribbon cables as a cost-efficient alternative to individual manual cabling.

Furthermore, the partners established a concept for demand-based logistics: control cabinet production at WKC is integrated into the Oerlikon production planning and control system. This facilitates the optimized on-time delivery of several thousand control cabinets every year in the Oerlikon Barmag production facility in Remscheid.

Twice a week, the textile machine manufacturer receives tested control cabinets with top-quality switch functions so that no specialized electrical personnel are required for final e-technology inspections or revisions for the final assembly in the winding head production.

And it continues

With its comprehensive product portfolio and its solution expertise, Siemens has become a valuable key supplier for Oerlikon and is involved in further development projects. The automation concept of the WINGS POY system has thus successfully been extended to other types of winding heads. The partnership award presented to Siemens at the Oerlikon Supplier Day in November 2011 provides recognition of the services already rendered and motivation for the future. During the event held at the Oerlikon head office in Pfäffikon, the future goals of the partnership were also defined. +

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Hot Rolls

To increase the throughput of a hot mill most end customers strive to achieve a higher level of automation in their production processes through a programmed control system and robotic handlers. An innovative programming solution with on-the-fly algorithm switching provided the solution for automated operation of a hot mill.

Because of the tough market conditions that the world's machine tool builders are faced with, companies try especially hard to secure business in their own domestic markets. This is particularly so in the BRICs (Brazil, Russia, India, and China). Against this difficult backdrop, the Russian machine builder TMP was awarded a contract to build an innovative new hot steel rolling project in Brazil.

TMP, based in the ancient city of Voronezh, Russia, is the largest developer and builder of equipment for the country's metal forging industries. In terms of world presence, of the 17 hot forging presses with pressure greater than 10,000 ts in current operation across the globe, 8 were built by TMP. The main task of this project was building a hot rolling press system, called Rollers. The Rollers produce one of suspension details of trucks and consist of the hot rolling press with special manipulator, the system of transport of hot billet and other technological equipment. For this mill, TMP developed an intelligent automated handling system, called Rollers, to manipulate the hot working material.

Rolling hot steel

The technological algorithm of rollers is divided into several parts. First, the general receiving manipulator transfers a red-hot

billet to the feed conveyer by an exactly defined path calculated according to the safety standards. The feed conveyer transfers the billet to the roller manipulator, which grips the billet and begins the multiple rolling process. Each roll has four deep grooves. A billet is rolled through couple rolls which are formed in the shape of a billet. Usually after four forming cycles, the roll manipulator

transfers the billet to the outfeed conveyer, which in turn transfers the billet on to the next manufacturing stage.

Many variables to control

The control system within rollers performs a variety of important tasks. In addition to the precision movement of the working

“The operational assistance of the qualified professionals at Siemens allowed us to resolve the many questions that arose during project development. The Siemens team helped us select and configure the control system and debug the real-time programs on time and within budget.”

Igor Valikov, Leading designer JSC TMP

material, it controls system temperatures, the hydroelectric equipment, and braking control. The PLC also coordinates the functioning of the rollers with other systems such as the furnace and other handlers, with communication passing via Profibus.

The intelligent control driving the rollers is based on Simotion D435, a compact drive-based motion control platform combining motion control, logic control, and drive control within a single hardware environment. Simotion is the natural successor to earlier PLC approaches based on the S7-300 platform. Its greater power enables a larger volume of programs to be run simultaneously.

For the main drive, Sinamics S120 was chosen. Sinamics S120 is a modular motion control drive system for complex tasks. It carries out the complex motion control of two axes of the roller manipulator, with each axis being equipped with 5 kW Simotics S-1FT6 mo-

tors. The distributed I/O system is an ET 200M station, connected to the Simotion D435 via Profibus. The control provides the operators with system information such as the drive operating hours, number of cycles, axis drive currents, and fault reports.

For the rollers project the programs are written using Simotion Scout, the network topology is performed in NetPro, and the HMI is provided via WinCC Flexible. These different systems all integrate seamlessly with the hardware platform. The open system integration enabled the TMP engineers to clearly specify and implement scalable solutions for complex technological tasks.

Variable behavior

The main challenge in developing the rollers was the two-axis motion control of the roller manipulator. When a hot billet is rolled, its shape changes dramatically, with each billet behaving in a slightly different manner. Because of this variance, the precise position of the billet as it exits from the rollers cannot be predicted by mathematical modeling. In order to achieve accurate control of the handling, a motion control system with on-the-fly switching of control algorithms for each axis was developed. The main principle of

the algorithm is the capability to switch from master to slave mode on-the-fly. With the sophisticated control system implemented by TMP, the roller achieved a throughput of 130 billets per hour.

This Rollers project was TMP's first motion automation project using Simotion controls and Sinamics drives. Despite their relative lack of experience with this environment, the TMP engineers were successful in accomplishing an ambitious project that included the fast switching algorithms for the roller manipulator. The experience gained opens up opportunities for TMP in the development of further complex integrated machines. +

MORE ON THIS TOPIC:

+ www.siemens.com/simotion

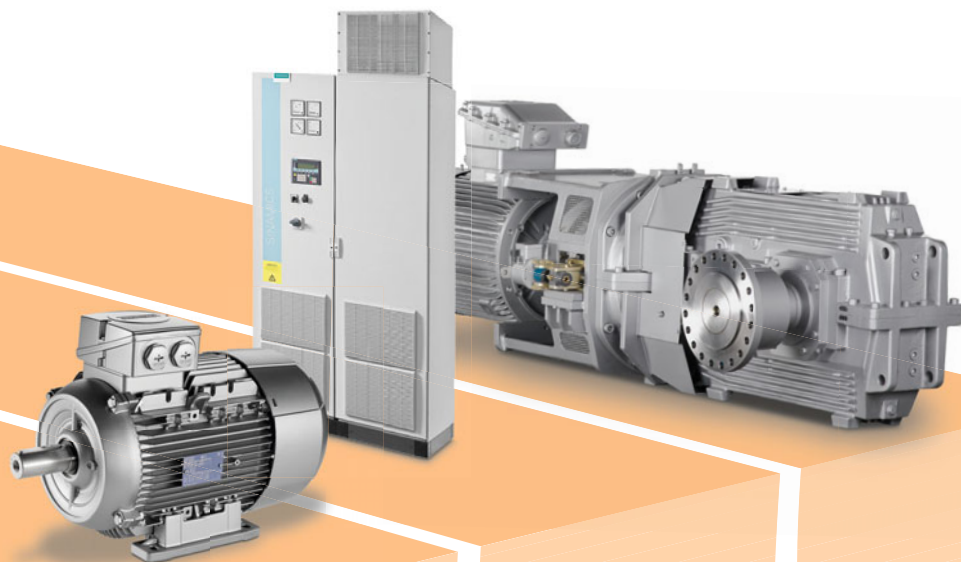
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Greater Energy Efficiency in the Drive Train



10%

High-efficiency IE2 and IE3 motors

30%

Frequency converters, through speed control and energy recovery

60%

- Optimization of the drive system
- + Use of geared motors and direct drives, depending on the application
- + Sizer engineering tool for custom-fit dimensioning
- + Energy recovery in generator operation
- + Use of capacitors for energy storage during power peaks
- + Drive diagnostics
- + Choice of the ecologically and economically best drive concept

Drive technology is the key to energy-efficient operation of industrial plants. It is responsible for a major share of the energy costs, but this also means that there is high potential for savings. These savings can be achieved not only through the use of efficient motors and frequency converters but also through optimization of the drive system. The various measures should be combined for maximum effect.

A speed-controlled drive train consists of the mechanical interface with the machine (connector and gears), the motor, a frequency converter that controls the motor's speed, and a motion control system that provides the frequency converter with the set-point values.

Savings through higher efficiency and speed control

Efficiency-optimized motors and frequency converters have the greatest potential to provide energy savings. On June 16, 2011, the high-efficiency IE2 class, assigned to motors with an efficiency of up to 7 percent greater than conventional motors, became mandatory for motors introduced in the European Economic Area. There are plans to make motors with the even higher efficiency class, IE3, which is up to 10 percent greater, mandatory between 2015 and 2017.

The most important factors with regard to energy savings in frequency converters are speed control and energy recovery. Speed control, which pays off especially when using pumps, fans, and compressors, constantly adjusts the input power to current requirements during partial-load operation. This allows for savings of up to 60 percent – in extreme cases even up to 70 percent. During energy recovery, the Sinamics G and S converters feed the braking energy that is normally burned due to braking resistance back into the power grid; this leads to energy savings of up to 60 percent, for example, in lifting applications. Additionally, the decrease in power loss improves the cooling of the system and allows for a more compact design.

Potential energy savings of 60 percent in the overall system

According to data from the Central Association of the German Electronic Engineering and Electronics Industry (ZVEI), component-specific measures such as increasing

motor efficiency or using a frequency converter for variable-speed operation can tap only 40 percent of the total savings potential in the entire drive train. The remaining 60 percent is derived from the optimization of the overall system. To exploit this energy savings potential, integrated solutions for the entire drive train that focus on the interaction of the system components are needed – from the right drive and proper dimensioning to optimal energy utilization by the drives.

The efficiency of the entire drive train, for example, can be significantly improved through the use of highly efficient helical gears and helical bevel gears. Here the motor and gears are completely integrated to form a single unit, for example, in the Flender EMPP vertical mill drive, which is used especially with high outputs, such as in milling raw material in the cement industry, and which leads to a decrease in power loss of up to 5 percent, depending on the application. In applications with very low speeds but high torque, such as with papermaking machines or sludge pumps, but also with extremely high speeds of more than 10,000 rpm, direct drives improve efficiency by about 2 to 3 percent. With the Sizer engineering tool, the drive train can be planned with custom-fit dimensions so that oversizing of the motor can be avoided. The type of cooling also plays a role when it comes to the energy balance. Because water heated in the cooling process can be reused as industrial and process water, liquid cooling is the more energy-efficient alternative. However, sometimes it's the simple solutions, for example a soft starter combined with an IE3 motor, that represent both the best solution ecologically and economically because of their extremely high efficiency in fixed speed applications.

Using energy optimally

In many plants, not all axes are motor powered; some work in generator operation during certain phases of the process.

Through the use of inverters with intermediate circuit coupling – as offered by the Sinamics S120 drive family – the generated energy is directly fed to the motor-powered drives via the common intermediate circuit. The direct energy exchange from inverter to inverter minimizes the power loss in the system, and the percentage of energy that can be saved in this way is often in the double digits. A further way of saving energy is temporarily storing the generated energy in the capacitors and gradually feeding it to the users instead of converting it into heat. Last but not least, the diagnostics function integrated into the drive train can help further decrease the power demand or ensure that it is consistently maintained at a low level.

Conclusion

Optimized drive technology, with an integrated concept from network access to the mechanical interface with the load machine, is the key to energy-efficient and economical operation of an industrial plant. +

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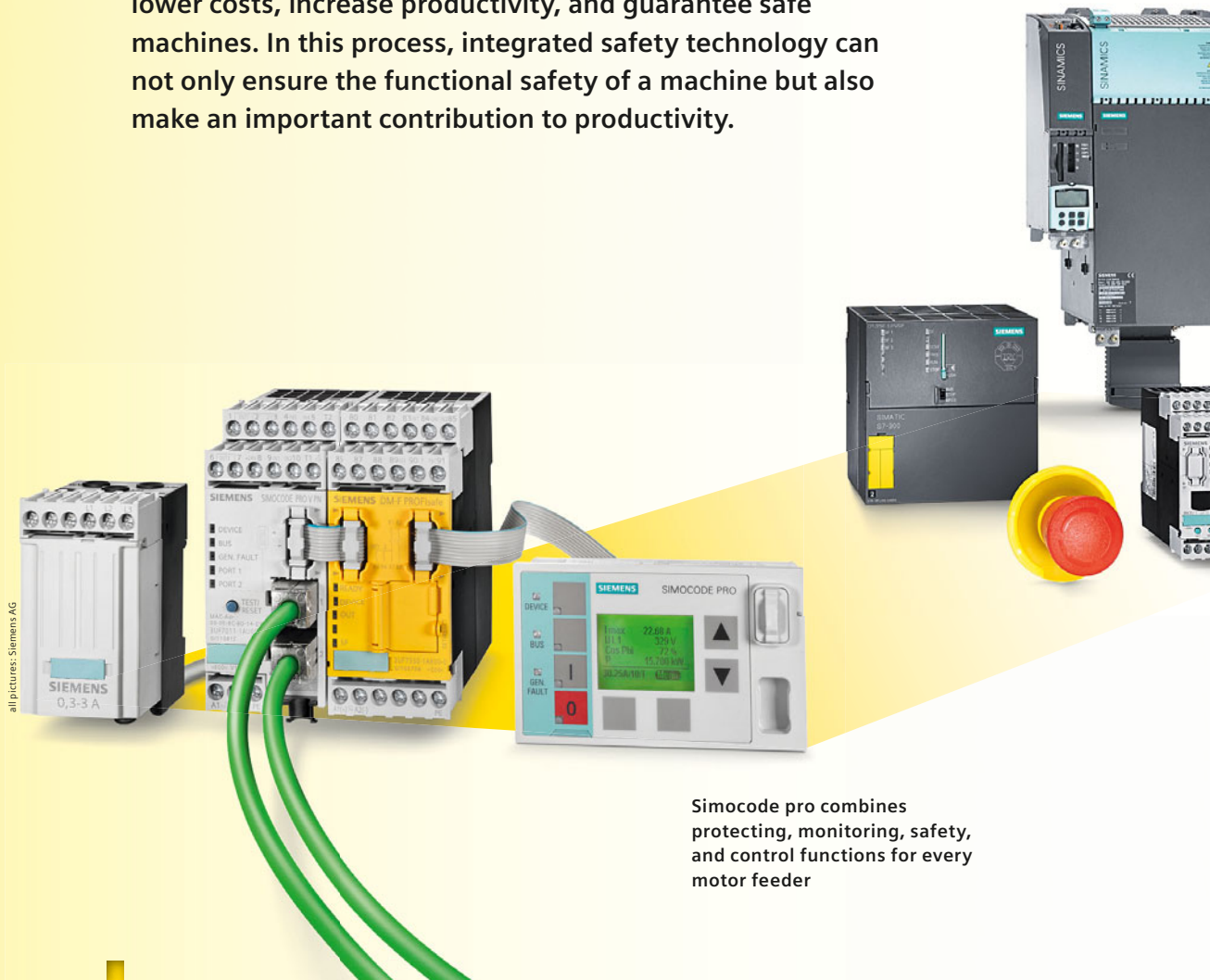
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Perfect Interaction of Standard and Safety Technology

Manufacturers and operators of machines always need to lower costs, increase productivity, and guarantee safe machines. In this process, integrated safety technology can not only ensure the functional safety of a machine but also make an important contribution to productivity.



Simocode pro combines protecting, monitoring, safety, and control functions for every motor feeder

+ Advantages of Safety Integrated at a glance

Cost-effectiveness

- + Cost minimization through consistent bus system and less hardware
- + Efficient engineering for safety and standard tasks

Productivity

- + Shortened downtimes through comprehensive diagnostic functions
- + Fast restart
- + Design that saves space, time, and costs

Standardization

- + Consistent operator interfaces
- + Increased reusability through libraries
- + Simplified installation through bus systems

Flexibility

- + Scalable solutions
- + Conformity and approvals for worldwide use
- + Simplified modernization through long-term product availability

Siemens offers a comprehensive portfolio of control technology, drive technology, and switching technology for perfect safety concepts



Machine manufacturers and plant operators alike are interested in the integration of safety technology in their plants. Along with legal regulations regarding the protection of persons, there are also economic reasons for avoiding personal injuries and the resulting downtime, as well as for protecting machines and materials from damage. Integrated safety technology offers crucial advantages for machine manufacturers in this context: less hardware, less engineering effort, and time and cost savings. Plant operators also benefit, as the availability of their plants increases thanks to rapid diagnostics and less downtime. In addition, plants become more flexible and sustainable due to the modular design and the easy-to-upgrade and easy-to-expand system, since any necessary modernization can be implemented easily and economically. Dr. Thomas Grögler, head of Safety Integrated at Siemens, explains, "In

automation technology, the trend is toward the integration of safety functions into standard automation. Through the perfect interaction of standard and safety technology, machine manufacturers can create safe machines easier and faster and achieve the highest levels of both safety and productivity."

Control systems and drives with integrated safety

With Simatic, Siemens offers fail-safe control systems for standard and safety tasks that enable the optimal productivity of the machine thanks to comprehensive diagnostic functions. One innovation is the TIA Portal engineering framework, which also makes engineering for safety functions possible through Step 7 Safety Advanced.

Intelligent safety concepts can be realized thanks to the integration of safety functions into drives and motion control systems such as Sinamics. These functions facilitate machine operation, prevent damage – for example, by monitoring safe positions (Safely Limited Position [SLP]) – and have a positive influence on productivity. When using the Safely Limited Speed (SLS) function, the plants no longer need to be shut down, for example, for set-up and maintenance tasks, and then referenced again with great effort. And the Safe Torque Off (STO) function guarantees that no torque-building forces can affect the motors, thus preventing unintentional starting.

Motor management with integrated safety

In addition to control systems and drives, the Safety Integrated program also offers switching devices with safety already integrated. Simocode pro, the modular motor management system for motors in the low-voltage range, combines all the necessary protection, monitoring, safety, and control functions for every motor feeder in one compact system. Two new fail-safe digital modules, DM-F Profisafe and DM-F Local, are used together with Simocode pro above all in process auto-

mation for the safe shutting down of motors. The modules fulfill the requirements of the IEC 61508/62061 to SIL3 and ISO 13849-1 to PL e standards. DM-F Profisafe receives the fail-safe signal from a fail-safe control system via Profibus, or now also Profinet. In this process, there are pre-assembled, TÜV-certified library components available in the Step 7 Distributed Safety option packages and the S7 F systems, which considerably simplify the configuration.

Partners for integrated safety

With Safety Integrated, Siemens supplies the intelligent answer to continuously growing demands concerning the functional safety of machines and their cost-effectiveness and flexibility. The comprehensive portfolio of control technology, drive technology, and switching technology enables the development of scalable, perfectly adapted safety concepts for the protection of people, machines, and the environment.

As a partner in all safety matters, Siemens also supports users with solution examples and up-to-date expertise on international standards and guidelines. In addition to the free TÜV-tested Safety Evaluation Tool for the evaluation of safety functions, Siemens offers custom-tailored training courses on CE marking, functional safety, and risk assessment, as well as on the Safety Integrated products. +

MORE ON THIS TOPIC:

+ www.siemens.com/safety-integrated

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Safely Packed

When it comes to installing and retooling a machine, comfort, productivity, and safety go hand in hand. That is why the machine-building industry increasingly requires safety functions that are as flexible as modular machines. The solution: drive-based functions coordinated by small, cost-efficient F-CPU's.

Hugo Beck Maschinenbau GmbH in Dettingen/Erms, Germany, is a leading manufacturer of horizontal form/fill/seal machines for demanding packing operations in sectors such as the postpress-processing industry. Due to increasingly short amortization cycles, more frequent product changes, and smaller lot sizes, packing machines need to be adapted to the job or lot at hand more quickly. Flexibility up to the shortest possible delivery time for a machine is the key to success.

Up to 18,000 products per hour

Hugo Beck consistently incorporates these requirements in two new series of horizontal form/fill/seal machines: servo X and neo X. The servo X series, a further development of the Flexo machine series, now operates nonstop thanks to move-

ment-controlled servo drives and revised mechanisms, packing up to 8,000 products an hour.

The newly developed neo X can even pack as many as 18,000 products an hour. At this high operating speed, a combination of upstream barrage and finger chain

guarantees a controlled and constant distance between products when inserted in the film bubble.

From the film unwinder to the infeed cycle and lateral and longitudinal sealers to the take-up stand for the rewinding of the remaining film, the servomotor-driven

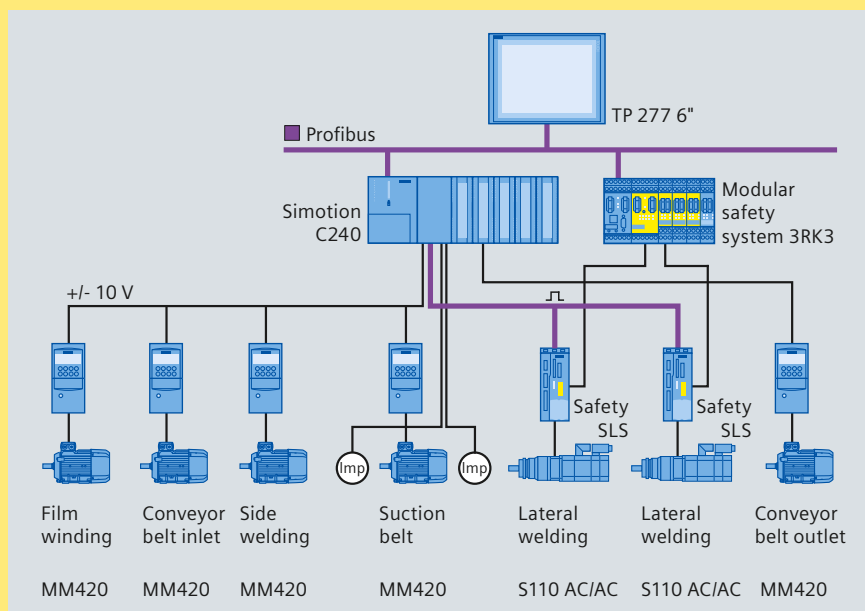
"The drive-based safety solution facilitates the development of versatile, user-friendly machines and makes it easy to adapt them to the operator's situation."

Ulrich Dilger, Chief Designer and Product Development Manager,
Hugo Beck Maschinenbau GmbH



all pictures: Siemens AG

The series neo X is designed for up to 18,000 cycles and commands servo motors for recipe-controlled changeovers



System-integrated safety functions guarantee a clear and easy-to-maintain system architecture

shafts of all the machine modules are synchronized by means of the Simotion D motion control system. The Sinamics S120 frequency converters with independently operating drive-based safety functions serve as drives.

In the simplest case, the safety functions can be activated directly via a door sensor or an emergency switch, which is made possible by means of wired signals and by the Profisafe protocol via Profibus or Profinet. The main advantage of this approach is that with sophisticated safety functions such as safely limited speed or safe operating stop, the drive position control remains fully operational. Thus the higher-level Simotion D motion control system can maintain the synchronized relations in the shaft assemblies between the machine modules. This is the most important prerequisite for resuming operations quickly after a safety action and the foundation for a user-friendly and safe drive-supported set-up.

Compact F-CPU creates a new degree of freedom

At Hugo Beck, the safety function to be carried out by every drive in a particular situation has been programmed in a small safety-oriented control. It is therefore easy to intelligently link the safety contact status, the current operating mode, and the user actions. Subsequently, differenti-

ated safety responses (adapted to the situation) are triggered, which in turn are implemented by the drives autonomously. Ulrich Dilger, chief designer and product development manager at Hugo Beck, offers an example: "The film box for carrying the packaging film is fully functional and synchronized during manual work at the sealing station. However, as soon as the film box is opened, the sealing station and infeed cycle are stopped or set to slow." A dangerous action is avoided by means of the safety technology of the drives. Because these can be left active, drive-based set-up functions are possible even if the protective housing is open. And because many manual tasks that were previously required after production interruptions are no longer applicable, such as removing the remainder of the film, productivity is increased.

For the servo X, the MSS 3RK3 modular safety control from the Sirius program is used, while for the neo X, the high-performance F-CPU from the ET 200S I/O system is implemented. Both fail-safe CPUs are programmed using Siemens' standard engineering systems. Because the basic safety functions are already certified, all that remains to be done is program the safety response logic.

Thanks to the system change from safety relay to safety control, the machine manufacturer saves both time and wiring expenditure when installing the machine

and putting it into service. The safety function is deployed on every similar new machine by means of a simple software upload. This makes it easier to comply with even very ambitious delivery deadlines.

Simple engineering – huge benefits

Intelligent drives, a powerful motion control, and compact safety controls create a highly flexible platform. Even with system-integrated safety functions, user programming remains convenient and flexible, as the motion control program itself does not require a security-related approval. The machine's range of functions easily can be adapted to customer requirements, and different expansion stages of the user program can be operated with the same safety functions approved by the trade association. +

MORE ON THIS TOPIC:

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Configurators

CAx Onlinegenerator

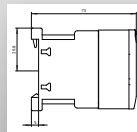
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drawingsCAE support
(macros)

Efficiency Can Be Planned

Even in the Internet era, design engineers are still often faced with many questions that are difficult to answer, such as, which product is most suitable? What specifications does it meet? How do we import its technical data into our own network environment? Siemens provides the answers with its new Planning Efficiency platform that was introduced at Hannover Messe.

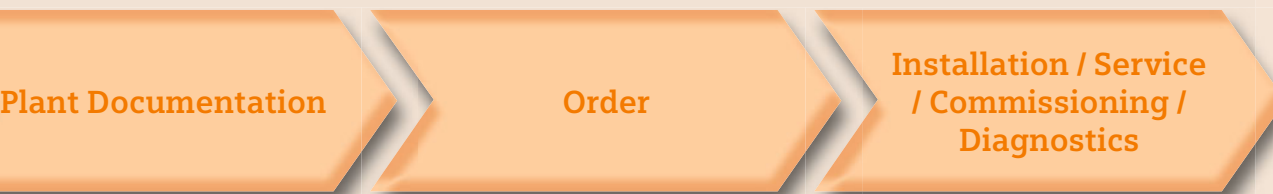
With support systems for planning and implementing electromechanical designs, an estimated potential of 80 percent savings is possible in the work surrounding construction. To achieve this, additional programs such as configurators, modern CAE systems, and CAD systems are required, as may be product data from a centrally maintained database for the support of planning activities when looking for electromechanical solutions. Siemens has therefore created the Planning Efficiency platform, which helps

users minimize the time needed for the control cabinet configuration, thus increasing the efficiency of their plants.

Configurators for targeted product selection

One key benefit provided by Planning Efficiency is assistance in selecting the right product. Siemens offers configurators for industrial switching technology, safety technology, control technology, drive technology, and building management

systems. These tools enable electrical engineers to intuitively find the optimal solutions quickly and successfully, without a great deal of search effort. For example, a CAE manufacturer determined that the preparation work per piece of equipment takes an average of 2.7 hours. If a planner needs a complete branch with circuit breaker, contactor, and soft starter, the time needed for data search and processing adds up to about 8 hours. However, with a configurator, all the required product information is available immediately

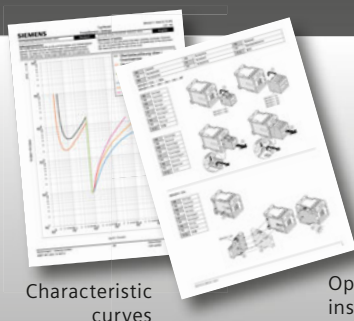


MyDocumentationManager

Industry Mall

Industry Online Support

Easy access to information and the 12 process-relevant data types per product through the online functions



Characteristic curves

Operating instructions



Certificates



Data sheets

all pictures: Siemens AG

For example

- Product master data
- Device circuit diagrams
- Product photos
- Connecting diagrams

after the product-specific selection based on the technical data. Afterward, all the available CAE/CAD data can be queried for individual products directly or via an export file (Excel format) using the CAX onlinegenerator.

Information and data around the clock

The second advantage of Planning Efficiency is that all the required data for the relevant products can be called up by simply pressing a button. To save the design engineers as much time and effort as possible, the CAX onlinegenerator has been expanded from 4 to 12 data types. The up-to-date data are available worldwide, 24 hours a day. Users can access the system any time via smartphone or tablet PC. The data contain certifications (UL for the United States, CCC for China, and Ghost for members of the CIS) as well as, for example, characteristic curves, manuals, dimension drawings, and even 3-D models. The data available are of high quality and can be easily processed. When using EPLAN electric P8 makro or other modern CAE and CAD programs, it is possible to optimize design effort and save time with the comprehensive configuration data from the CAX onlinegenerator. The data

are supplied in their original format and are therefore perfectly suited for a general import into these systems.

Optimal CAE system support

Such an increase in efficiency during electrical construction is possible only because the shift from a function-oriented approach to an equipment-oriented one is increasingly gaining momentum. The third essential element of Planning Efficiency is therefore central process management. For this, Siemens offers the user e-engineering through CAE support as well as documentation in compliance with guidelines, thanks to the manual configurator (MyDocumentationManager). This makes central data management possible, which ensures the lasting optimization of the entire design effort. For example, users working with EPLAN electric P8 (Version 1.9 or higher) can import the EDZ files (EPLAN Data Zip) provided by Siemens for the controls in a fully automated manner. This means that the electrical engineers hardly need to spend any time on data management anymore. With the aid of the EDZ files, it is possible to import all the available information within seconds, thus eliminating the laborious import of individual pieces of configuration data. There

are solutions already available that offer complete documentation, including all certificates and releases, at the press of a button. For example, the usual searching and copying to compile the documentation upon completion of a project are now things of the past, since individual manuals can easily be compiled using MyDocumentationManager.

Increasing efficiency is the name of the game

With Planning Efficiency Siemens created a platform that enables electrical engineers to minimize the time needed for planning, design, and construction using the product configurators and the CAX onlinegenerator. +

MORE ON THIS TOPIC:

+ www.siemens.com/planning-efficiency

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The Plus Factor for Specific Requirements

Siplus products and systems for specific markets and exceptional requirements offer high reliability, flexibility, and functionality.

Siplus comprises the Siemens automation portfolio for specific requirements. With it, customer requirements regarding investment security, process transparency, and low operating costs can be efficiently fulfilled.

For difficult ambient conditions

Siplus extreme offers products, systems, and solutions for reliable operation under less favorable to extreme operating conditions – for example, an extended temperature range, increased humidity with condensation, or exceptional medial loads. The devices in the Siplus extreme line are based on proven products such as the Simatic S7 controller that are, for example, refined and protected against corrosion

through conformal coating. They are then checked again and certified.

Scalable remote operation

Siplus RIC (remote interface control) is a continuous, scalable remote control system that extends the Simatic automation systems by three internationally standardized communication protocols: serial transmission according to IEC 60870-5-101, serial protection equipment connection according to IEC 60870-5-103, and Ethernet (TCP/IP) according to IEC 60870-5-104. Siplus RIC offers the same functionality and modularity for all systems and is therefore perfectly suited for monitoring and controlling plants spread out over multiple locations even under extreme

ambient conditions. The flexible and robust remote control system is recommended for oil and gas distribution systems, water and wastewater management, power generation and distribution, and traffic infrastructure.

Efficient heat control

Siplus HCS (heating control system) controls industrial heat processes precisely and efficiently, thus reducing costs. Whether for extrusion, thermoforming, or varnish drying, Siplus HCS offers three systems to control resistive loads at precise percentages. Through the integration of diagnostic functions, communication, and channel fuses, users benefit from up to 50 percent less wiring and up to 40 percent

The Siplus line offers a comprehensive range of products for a wide variety of applications:

Sidoor

flexible control for opening and closing sliding doors and gates

Siplus CMS

monitoring of machines and processes that increases availability

Siplus RIC

simple manufacturer-independent communication through internationally standardized remote control protocols



less space required in the control cabinet. Siplus HCS increases plant safety and ensures optimal, reproducible thermal processes.

Effective protection of investments

Siplus CMS (condition monitoring system), available in three performance classes, detects faults in machines and plants early on. It constantly monitors the vibration behavior and, if required, also temperatures. Beyond the basic functions of the entry-level Siplus CMS1000 device, the modular and configurable Siplus CMS2000 system offers frequency-selective evaluation processes with raw data recording triggered manually or by events. With the Siplus CMS4000 system it is possible for users to create their own monitoring algorithms and analytics processes. It also offers a flight analyzer for process data and the connection to automation systems. Thanks to Siplus CMS, maintenance work can be specifically planned, downtimes can be shortened, and effective stock keeping can be ensured. This results in high plant availability and increased productivity.

Reliable charging components

Siplus ECC (electrical charging components) offers controllers for the charging infrastructure of electric vehicles. These controllers communicate with the vehicle and control and monitor the switching devices. In this way, they ensure reliable, standard charging according to IEC 61851, charging mode 3. Moreover, active load management is possible via Industrial Ethernet. In addition to the EV-specific components, Siplus ECC offers preassembled, tested, and ready-to-go functional units that allow the simple and customer-specific set-up of a charging solution.

Safe door opener

The Sidor door control system safely moves all types of automated sliding doors weighing up to 400 kg with speeds of up to 0.7 m/s across opening widths of up to 4 m – reliably and precisely according to the applicable rules and regulations of the respective application. Automated motor recognition and dynamic door mass detection at the press of a button facilitate commissioning. During operation, integrated

detection of the coefficient of friction and of the door mass limits the moving speed of the door. Automated obstruction detection protects both persons and objects. Different operational behavior can be activated at the press of a button with six preset drive profiles. In addition, up to 26 parameters can be individually defined using the integrated terminal module. Event and status memory facilitates diagnostics during maintenance work. Interface modules ensure communication, for example, with a laptop computer. When the door will not be used for longer periods of time, the door control unit can be completely de-energized via an optional “Eco plus” add-on to save energy. +

MORE ON THIS TOPIC:

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Siplus extreme

robust solutions
for applications
under extreme
ambient
conditions



Siplus HCS

Efficient, fast, and
precise control of
industrial heating
elements

Siplus ECC

integrated
charging
solutions for
e-mobility



all pictures: W. Geyer



Reliable Identification through Wireless Communication

Increasingly, radio-frequency identification (RFID) in the ultra-high frequency (UHF) bandwidth is being used for cost reasons in industrial production for the automated identification of objects. Groundbreaking functions of the new generation of the RF600 reader increase operating safety under production conditions that are difficult for radio transmission.

UHF RFID systems are increasingly being used in industrial production plants. Some of the reasons for this are the continuous identification of objects throughout the entire production process and the availability of low-cost disposable transponders (labels). However, industrial production plants represent a challenge for radio-based systems.

More often than not the read devices are so close to each other that mutual influence on radio transmission cannot be prevented. Also, the distance between the objects to be manufactured is small. Parallel assembly lines further complicate differentiation between the object to be registered and the one on the adjacent line.

Furthermore, the signal sent out by the reader is reflected by metallic objects. This means that radio waves may spread out and overlap, there may be areas without reception, and the transmitter range may unintentionally become larger. This is why transponders within the sensing range of the read devices may not be registered, while others that are outside the radio field may be read. It is possible to compensate for dead spots with higher transmission power, but this increases the risk of overshooting. Conversely, when the transmission power is decreased, fewer irrelevant transponders are read, but the detection rate may also be lowered. To ensure processing reliability, the RFID system

must be able to solve this conflict intelligently and identify only the object that is within the admissible reading range.

Adaptive transmission power, intelligent filters

This is possible thanks to new functions in the devices of the Simatic RF600 series, which automatically adjust the transmission power and filter the read results using software. Broadly speaking, adaptive transmission power ensures a high detection rate, and the intelligent filters automatically eliminate overshooting. The transmission power of RFID read devices is quite often set at a higher level than nec-



RFID as key technology for Industry 4.0

Data streams and radio communication are the technical characteristics of "Industry 4.0," the fourth industrial revolution, which is being introduced step by step in production facilities. Basically, this revolution is about the digitalization of production, which enables manufacturers to make customized products with high efficiency. Flexible machines and locally controlled material flows will ensure that the factory of the future does not remain rigid but can organize itself and adapt to changes in utilization and demand. The good thing is, required technologies are to a large degree already available today. For example, UHF RFID transponders that are permanently attached to the products ensure a continuous information flow throughout the production process. The benefit is increased competitiveness combined with consistently high quality and comparatively low unit costs.

UHF RFID systems ensure consistently high quality – from the first processing step to shipping

essary, just to be sure. However, with adaptive transmission power, the reader keeps increasing the power gradually until it clearly detects at least one transponder in the radio field. Since no more power is used than the amount needed, the potential for radio interference is reduced. However, the reader can independently compensate for dead spots, thus significantly increasing process reliability.

If too many transponders are detected due to overshooting, these need to be filtered out. For this, the new firmware offers a multistage filter concept that can distinguish, based on the radio characteristics in the area, which transponders are being detected directly and which are overshooting. Key characteristics are values such as the radio signal strength indicator (RSSI), that is, the field strength of the transponder response, the read frequency, and the required transmission power. In especially difficult cases, the inventory threshold filter monitors the transponder for a set time. The statistical evaluation at the end of the measuring period then successfully filters out any remaining overshooting.

Reliable access

Once a transponder has been clearly identified, the "tag hold" function ensures that the reader maintains communication with the transponder even in highly dynamic environments. The "black list" function, in contrast, prevents the registration of transponders that have already been processed. These functions display their strengths especially when objects move past the reader in quick succession.

Highly metallic surroundings may require individual antenna selection. With the RF620A, RF640A, RF642A, and RF660A antennas, the Simatic RF600 portfolio offers the right device for every reader. Transponders are also available in high IP degrees of protection, and smart labels are now available in heat-resistant versions. Special transponders can be mounted on or even flush with metal. If especially high availability is required, certified labels can be used. To determine the optimal configuration of a transponder and its physical installation, a simulation of the electromagnetic fields can be carried out beforehand. In this way, problems with dead

spots can be detected prior to the practice test, and corresponding measures can be taken.

Made for industry

The right function mix for each application must be determined on-site. The new firmware for the RF620R and RF630R UHF readers offers a versatile toolbox to ensure high process reliability even in demanding environments. In addition, UHF RFID now can be used in industrial production environments that were previously considered too difficult. +

MORE ON THIS TOPIC:

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Safe and Reliable with Wireless

The conversion to Industrial Wireless technology makes the distribution warehouse of a leading pump manufacturer one of the most modern in the world. Thanks to a redundant network, the automation system fulfills the highest availability requirements.

With annual production of 10 million pumps and approximately 70 operating companies in 43 countries, Grundfos A/S, headquartered in Bjerringbro, Denmark, is one of the world's leading pump manufacturers. As with so many large manufacturers, Grundfos's distribution warehouse is a complex area in which thousands of orders must be carried out, packaged, and transported to the warehouse and from the warehouse to trucks around the clock. All this takes place with almost no manual intervention. After the order has been entered into Grundfos's SAP system by an employee, the process is fully automated up until the final inspection. Once an employee at the distribution warehouse has checked on the screen that the correct pumps have been packaged, the box continues its path through the system and technology takes over once more.

Good-bye to slip rings

If the system fails, there is a congestion of pumps and the distribution warehouse turns into a bottleneck. That is why Grundfos control engineer Steffen Schmidt was given the assignment to conduct a risk analysis of the 10-year-old systems and to develop suggestions for a future-proof alternative. "We had daily downtimes, and it was becoming increasingly difficult to get hold of spare parts," he explains. The manufacturing execution system (MES) that was in place at the time was very specific, and the control system as well as the Interbus I/O devices had been discontinued. Schmidt recommended rebuilding the system from scratch, choosing a solution

based on modern standard components and integrating it into the company's SAP system. Grundfos decided to convert the warehouse to wireless technology. The main reason was that the cars that automatically transport the boxes with the pumps from the packaging area to the high-rack storage area had previously been controlled serially with the help of high-maintenance slip rings. "We were constantly busy cleaning those slip rings," says Schmidt.

A market analysis revealed that Siemens offered the only viable wireless solution. Now a fail-safe Simatic S7-416F-3PN/DP is being used and all the logistics systems are based on the open Industrial Ethernet standard Profinet with PROFIsafe. Scalance X204 switches are used in a redundant

ring. A Scalance X414-3E switch is used for the high-performance link with the higher-level control system. The slip rings have been replaced by an antenna on each car; the antennas pick up signals from the Scalance W access points, which cover the entire warehouse. The access points have process response times of 32 ms, as the entire security solution is based on Industrial Wireless LAN (IWLAN). The emergency stop systems of the driverless cranes are compliant with Safety Integrity Level (SIL) 3, Cat 4, and are also operated via the wireless network. This is possible because the Profinet solution ensures data transmission in real time.

The fact that safety-related and standard communication are now based on the same CPU is a significant advantage for the technicians at Grundfos. Now they have to monitor and maintain only one PLC, one network, and one technology. "The current safety system is a lot simpler than the previous one and fulfills all our requirements," says Schmidt. "Personnel are protected by light curtains and the safety solutions in the packaging areas, the emergency stop systems, and all other components within the car area work with Profisafe."

Simple diagnostics, improved maintenance

The benefit of Profinet and standard technology extends far beyond the safety aspect. "Since all system components come from Siemens, we had integration possibilities we would not have had otherwise," the safety engineer explains. "One big advantage is the detailed hardware diagnos-

Advantages of the new system

- + Fail-safe and standardized communication are based on the same CPU and one consistent network: IWLAN, Profinet, and Profibus
- + Significant reduction in maintenance and service time and costs
- + More transparency through web-based diagnostics
- + Very high system availability through a redundant network
- + The IWLAN solution perfectly meets Grundfos' requirements



The entire logistics system in the high-rack storage area consists of a comprehensive Profinet solution with Safety Integrated

Because the previous, slip-ring-based communication solution was very maintenance-intensive, Grundfos chose a wireless network

The process can be monitored and controlled centrally as well as via a Simatic Mobile Panel 177



all pictures: Lars Holm

tics. We can immediately see what errors have occurred and where. If a cable breaks, for instance, we can locate the break to within a meter." Thanks to the Profinet-based solution, the status of the machines and components is also easier to monitor. "If a crane fails, we can easily see how many hours it has stood still since the beginning of the year. So we no longer have to make assumptions when it comes to whether a machine is prone to failures." The main advantage of this traceability, however, is that disturbances can be recognized before they lead to serious problems. Runtime analysis has enabled Grundfos to make the change from failure-based to scheduled maintenance.

The system has saved the technicians a lot of time and work, not least because it stores all data centrally. "The PLC and all other components are available in the Simatic WinCC SCADA system," Schmidt says. "And thanks to an integrated web server we can even check the diagnostic data from home – something that has saved us quite a few nighttime drives and further serves to increase the unit's availability." +

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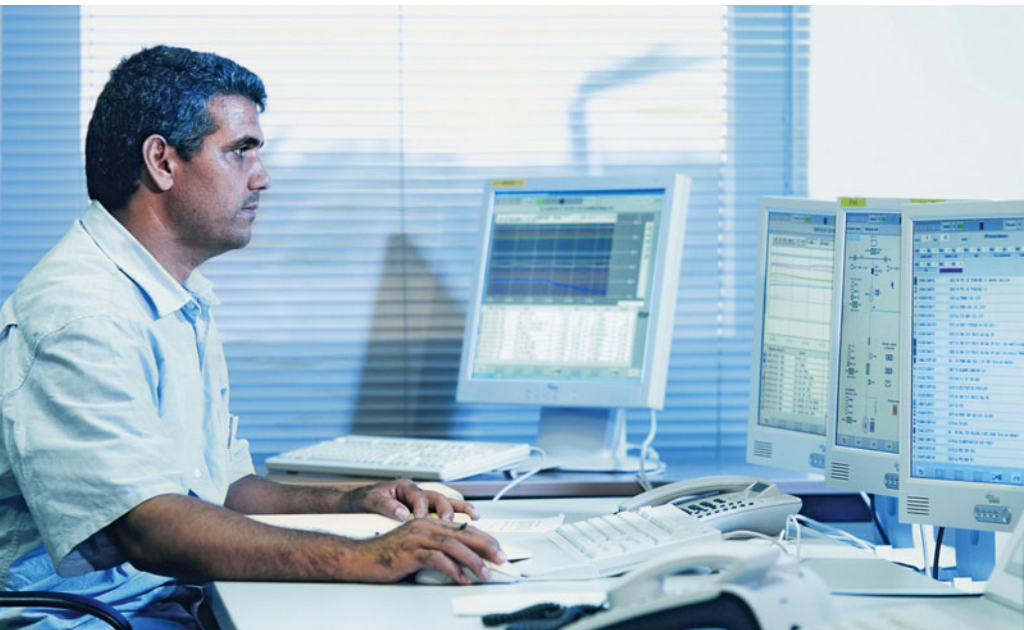
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Efficient Plant Monitoring



Industrial maintenance services minimize downtime and increase efficiency. A web-based condition-monitoring system helps detect problems in plants at an early stage as well as improve processes.

It is possible to give a service technician direct remote access so he or she can request rapid support if necessary

One of the greatest loss-makers in manufacturing is unproductive time. Condition-based inspection and maintenance can minimize downtimes. To do so, the current equipment condition must be automatically determined, saved, and processed according to the user's requirements. Special monitoring options support and inform the machine operator in this process. ePS network services offer location-independent condition monitoring for industrial plants, which detects potential problems early and can be used for process improvement. Downtimes are minimized, maintenance costs are reduced, and complex business processes are displayed and coordinated.

Access to machine data at any time

With ePS network services, both service specialists and maintenance staff can access information on the operation and disturbance of the connected machines around the clock, thanks to cloud-based software that supports service and sup-

port processes. Moreover, the condition-monitoring system is also available via the Siemens Remote Service (SRS) platform. This technology enables safe, flexible, and location-independent company-wide technical services with the help of telecommunication networks. The focus is on proactive services and multimedia communication. Important applications include maintenance and process optimization when using machines and equipment – especially if products such as Simatic, Siplus CMS, Sinumerik, PCS 7, or Simotion are used in the industrial plants.

However, it is also possible to telemonitor the condition of components from various manufacturers, as well as motors, gear units, robots, sensors, and PCs, using standard interfaces. The ePS network services work worldwide and supply a detailed image of the history and current condition of the connected machines at the press of a button. The system can be configured so that those responsible are informed immediately via e-mail or SMS in the event of a problem. In addition, the us-

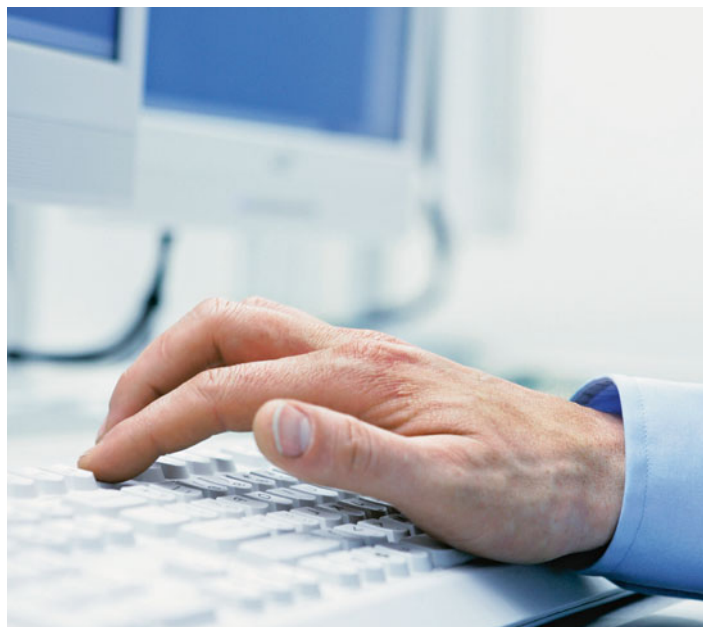
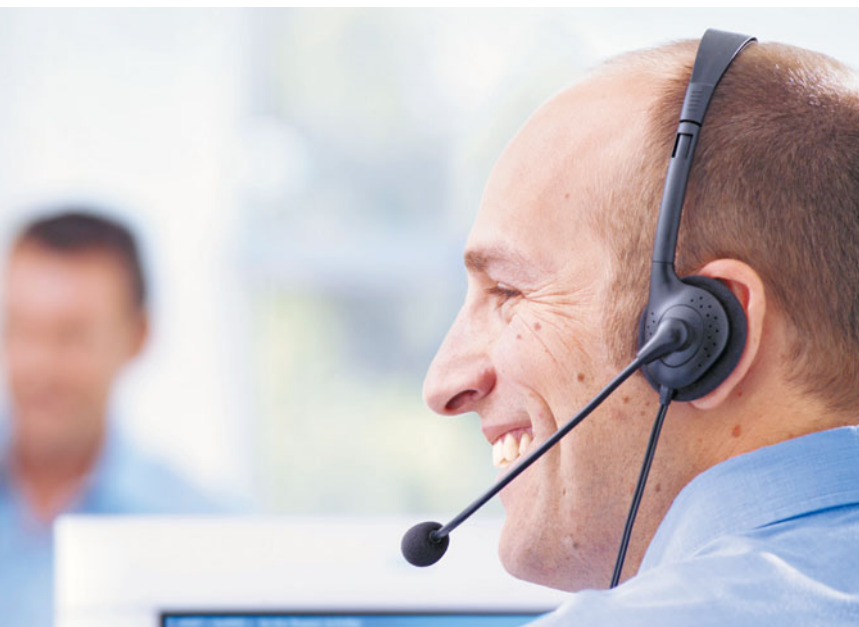
ers can activate special test and diagnostic programs at any time and evaluate them online. The ePS network services can be activated on any PC since access takes place via an Internet connection. It is also possible to give a service technician remote access so he or she can request rapid support.

Reporting for greater transparency

Because all remote access is recorded for services based on SRS, and the corresponding processes are backed by reporting, remote services become more replicable, transparent, and secure. This security is continuously being checked and confirmed through certifications such as ISO 27001.

Modern agent technology at work

The integration of the ePS modules into the plant, as well as the resulting benefits, applies to all working levels. For example, the data are recorded at the operational



Users can activate special test and diagnostic programs at any time and evaluate them online

and control levels through the ePS agent, which receives the machine data from the plant on a PC, a server, or a Microbox and sends it to a data storage unit. Depending on the customer's guidelines, this can be the central ePS server by Siemens or a satellite within the plant infrastructure. The ePS server also supplies software tools for data management. Condition monitoring requires little effort and is effectively im-

plemented through reporting and workflow services such as SMS, e-mails, and maintenance tickets. All data can be condensed for statistical collection or machine comparisons and can also serve as a basis for planning for the management. The services supplied by the ePS technology can be used both in the context of one-time service projects and through service and maintenance contracts. Included

in the services are continuous condition monitoring, continuous and automatic data and event monitoring, function tests, remote fault location and analysis, diagnostics and support, workflow integration, and a central recording service. +

Remote service for kitchen manufacturer

ALNO AG, a leading global kitchen manufacturer, is supported by Siemens Remote Services (SRS), a service based on a platform with the highest standards regarding IT security, availability, and flexibility. This ensures quick, secure, and cost-effective support by Siemens experts at any time. In this process, ALNO retains total control and transparency of the switched connections and the transferred data. The integrated automation system delivered by Siemens, based on Simatic S7 and WinCC, controls and visualizes all the processes in the high-bay warehouse. Any plant faults are diagnosed and recorded through an integrated reporting system. With the help of the experts from Siemens and SRS, if necessary, these faults can be quickly eliminated. In this way, SRS helps ALNO deliver products to its customers on time and with the requested quality.

IT security note

Appropriate security measures (including IT security) must be taken to ensure the secure operation of a plant. More information on industrial security is available online at www.siemens.com/industrialsecurity

MORE ON THIS TOPIC:

+ www.siemens.com/condition-monitoring

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Sitop Selection Tool

Uninterruptible power supply in three steps

With the new version 3 of the Sitop Selection Tool it is possible to select and order uninterrupted power supply units (DC UPS) in addition to power supplies. Only a few mouse clicks are necessary to select the components of a DC UPS, which previously took a great deal of time – both for uninterrupted power supply units with capacitor and for those with battery technology.

Using the tool is very easy. After the user enters a few parameters such as buffer times or load current, the Sitop Selection Tool shows the applicable capacitor or battery systems as well as their performance characteristics. As additional support during the selection process, the user can compare several

configurations based on their performance characteristics. The user then transfers the relevant DC UPS configuration into the product list.

From there, the DC UPS configurations can be saved with their performance characteristics as Excel or Adobe files or transferred into the user's Industry Mall shopping cart. In addition, the user can choose further product information on the selected products, such as 3-D data, circuit diagram macros, or operating instructions, as well as the corresponding power supplies.

The Sitop Selection Tool is available on the Internet and in the Industry Mall.

www.siemens.com/sitop-selection-tool

1 First step: Using the parameters relevant to the selection, such as buffer time or load current, the appropriate DC UPS units can be selected.

2 Second step: For further product selection, the user can compare several DC UPS configurations based on performance characteristics.

3 Third step: After the user enters the desired products in the product list, they can be exported or transferred directly into the user's Industry Mall shopping cart.



Using the parameters relevant to the selection, such as buffer time or load current, suitable DC UPS units can be selected quickly and easily

all pictures: Siemens AG



Training courses for TIA Portal

Getting started made easy

With the Totally Integrated Automation (TIA) Portal, Siemens has redefined engineering. For an easy start in this unique work environment, Sitrain, Siemens training for industry, offers a number of training courses. The courses present the innovative TIA Portal interface and the expanded functionalities and prepare users to make competent use of the complete software and hardware line. Participants are taught the use of the engineering platform starting with the basics and learn about the options to configure, program, control, and maintain a manufacturing plant. The acquired theoretical knowledge is reinforced with numerous practice-based exercises on a TIA plant model. This way, the course participants are able to safely and efficiently plan and execute their projects from the start.

Detailed course descriptions are available at www.siemens.com/sitrain-tiaportal

Service	SIMATIC TIA Portal Service 1 (TIA-SERV1)	SIMATIC TIA Portal Service 2 (TIA-SERV2)	
Programming	SIMATIC TIA Portal Programming 1 (TIA-PRO1)	SIMATIC TIA Portal Programming 2 (TIA-PRO2)	
Engineering tools	Structured programming Web-based training (WT-TIAPROA)	Programming with SCL (TIA-SCL)	Programming with S7-GRAPH (TIA-GRAPH)
Operating and monitoring	SIMATIC TIA Portal WinCC machine-related (TIA-WCCM)	SIMATIC TIA Portal WinCC SCADA (TIA-WCCS)	
Safety Integrated	Configuring and programming with Distributed Safety based on TIA Portal (TIA-SAFETY)		
SIMATIC S7-1200	SIMATIC S7-1200 Basics course (TIA-MICRO1)	SIMATIC S7-1200 Advanced course (TIA-MICRO2)	

■ New courses

Compliance and business

Positive experiences

The basic rules for responsible entrepreneurship are integrity and compliance with all applicable laws and regulations. This is also true for sustainable economic activity since it creates new business opportunities that ensure profitable long-term growth. The consequences of improper and unlawful behavior can be enormous: horrendous penalties, loss of orders, penal consequences, and not least, the resulting damage to the company's reputation. However, along with these negative aspects, one thing is important to remember above all, namely, that a clear commitment to fair competition results in a consistent focus on product innovation and the customer.

To do justice to this claim and to continue to strengthen the trust of our customers in the company and its products, we have introduced a comprehensive compliance program. This year we once again presented our positive experiences with this program to our customers and business partners at Hannover Messe.

www.siemens.com/compliance

motion world for the iPad

The Siemens customer magazine *motion world* is now also available as an app in English for the iPad and can be downloaded from the app store. This way you can always have the magazine for CNC automation with you. The contents of the print version of *motion world* are combined with interactive features such as additional videos, animations, and photo galleries.

Get *motion world* on your iPad and receive even more comprehensive information – free of charge, of course.

Find more information on our website:

www.siemens.com/mowo-app



motion world in the app store

Scan the QR code with your iPad and download the *motion world* app directly.



Events

Keep up to date with the latest dates and events on Totally Integrated Automation.

Event	Location	Date
Automation & Engineering	Brussels	May 09–10, 2012
SPS/IPC/Drives Italia	Parma	June 22–24, 2012
FaPa	Beijing	June 20–22, 2012

Magazines

Our technical magazines are a real added value for your business. Regardless of whether you choose *process news*, *move up*, *motion world*, or *advance*, in our technical magazines for all areas of automation and drive technology the information and technology are interestingly presented, well researched and up to date, and described with application examples. You as a plant operator or machine manufacturer are always well informed – with information specially adapted to your industry. If you don't want to miss an interesting issue, you can order a free subscription to your professional magazine immediately.

www.siemens.com/automation/magazines

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Siemens offers you electronic newsletters on various topics for subscription at www.siemens.com/automation/newsletter. For example, with the Totally Integrated Automation Newsletter you will be informed by e-mail about new hardware and software, services, application examples, and important dates and events relating to Totally Integrated Automation – electronically and always right up to date. Simply register with your e-mail address.

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SIMOGEAR geared motors: simply compatible – efficient from all angles



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