One Step Ahead

Efficient automation solutions and drive technologies for all stages of the value chain
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Gleiwitzer Str. 555,
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Industry Automation Division
CEO Anton S. Huber

Drives Technologies Division
CEO Ralf-Michael Franke

Responsible for press rights
Arno Hoier

Responsible for content
Vertical Glass & Solar
Siemensallee 84, 76187 Karlsruhe, Germany
solar.industry.automation@siemens.com

Agency
Communication Consultants GmbH
Engel & Heinz
Jurastraße 8
70565 Stuttgart, Germany
Tel.: +49 711 97 893-37
Fax: +49 711 97 893-44
freehler@postamt.cc
Editor in chief: Christine Fröhler
Layout and DTP: Sandra Guileen
Managing editor: Hubert Heinz
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Dear Readers,

In a short space of time, the solar industry has developed from a niche segment to a booming sector with international sales markets. Today, wind and solar form the two main pillars of the renewable energy industry, and the number of global and local companies in the solar market has risen rapidly. As market demand grows exponentially, the need is growing for cost-effective automation, efficient usage of costly raw materials, and shortened intervals between development and serial production.

The importance of greater efficiency and durability in solar-panel production is increasing constantly. This necessitates a permanent optimization of manufacturing processes and material consumption. A faultless integration of continual processes ensures profitability for investors and operators: from the production of raw materials to discrete manufacturing of complete solar panels, all the way to control and communications systems in field installations.

High-end machines from German manufacturers currently enjoy a global market share of more than 40 percent. As much as 80 percent of the machines produced are exported worldwide. Therefore, a globally active, innovative and future-oriented partner that can offer on-site service and support is a major factor for success.

In the following articles you can find out more about Siemens’ extensive portfolio for even the most complex requirements. We look forward to your feedback on this magazine – feel free to send an e-mail to solar.industry.automation@siemens.com.

www.siemens.com/solar-industry
Will the year 2011 be remembered as a highlight in the history of the PV sector? An illuminating snapshot.

Hot, warm or cold? If you were to ask visitors at a solar industry trade fair this question, most would probably say “cold” – referring the actual temperature in the building. However, an attempt at gauging the temperature of the solar industry this year requires closer inspection. The world’s largest trade fair for solar technology, Intersolar in Munich, offered a good opportunity to do so. Once again in 2011, the fair set a new record with 77,000 visitors from 156 countries and 2,280 exhibitors from 47 countries. But does this upswing reflect the mood in the industry? There is no doubt that long-term, generous subsidies and a rise in global demand have contributed to an optimistic outlook.

Germany as leading market?

Solar energy’s share in the fuel mix in Germany, the leading country in solar technology, currently amounts to just over 2 percent. However, since 2008, the share of the mix has almost doubled. Reliable forecasts for the future of the industry are even more telling; experts predict an increase of almost 8 percent by the end of 2020. The German Solar Industry Association (BSW-Solar) forecasts 10 percent, while the Fraunhofer Institute for Solar Energy in Freiburg suggests as much as 15 percent. In terms of output, this means an increase of more than 30 gigawatts (GW) of PV capacity by 2020, according to the German Federal Environment Ministry, and 60 GW according to the Fraunhofer Institute. In 2010 alone, new plants were built with a total capacity of up to 8 GW, a figure that has meanwhile reached 17 GW. Yet the first two quarters of 2011 saw weak development. In most cases, German module manufacturers recorded losses, which could only be compensated by business abroad. In the meantime, Asia and the United States are beginning to position themselves as new leading markets.

Power shifts

Global development is currently showing a positive trend. In 2010, the industry was able to achieve global growth of approximately 17 GW for a total installed capacity of over 35 GW. That equates to the electricity output of around four major nuclear power plants. Germany continues to hold the leading position in the PV market, followed by Spain. In the medium and long term it can be expected that the United States and China will take on the leading role. In cell and module manufacture, Germany will be increasingly outperformed by countries such as China, Taiwan and Malaysia, according to market experts. Germany’s technological leadership, however, looks set to remain unchallenged. Production facilities in Germany enjoy undisputed renown.
The added advantages of PV solutions from Siemens

Siemens offers tailored solutions for the manufacturing industry in all areas of the PV value-creation chain. With an extensive portfolio, Siemens provides its customers with support across the globe – as a cooperative, fast and flexible partner. Customers benefit from greater levels of automation, increased energy efficiency and shorter project-planning times – to mention just three major factors.

In the area of field installations, Siemens not only delivers key components but also automation solutions for tracking systems, inverters and transformers, as well as complete PV power plants. Siemens also caters to customers in the solar thermal (CSP) sector with individual components as well as turnkey plants.

Currently, the United States is beginning to set new standards in the CSP sector. The world’s largest solar-thermal power plant is under development in the Mojave Desert; four power plants are planned, each with a capacity of 242 MW.

Contribution from the industry

What could the future look like if the industry continues to make the most out of the current subsidies and framework conditions – as different as they are across the globe? One strategy is becoming increasingly decisive: Reducing production costs while offering the highest quality of technical innovation for greater performance, all across the globe, is a sure-fire way of guaranteeing a future in the solar industry. Particularly as the increase in competition is having a positive impact on all factors. Yet this observation also has less encouraging implications: There is always the possibility of a market shakeout that would only work in favor of integrated groups. In conclusion, if we want to gauge the climate of the solar industry, then we need to look at the apparent temperature, as it is currently felt. And that varies significantly between each individual market participant.

» Even though installation costs for solar energy are sinking constantly, market development will still continue to depend on public subsidies for several years. «
Ralf Stefes, Business Development OEM

» Once we have reached grid parity in Germany, expanded the electricity grids and created additional storage capacity, we can expect solar energy to cover a double-digit percentage of the fuel mix. «
Bernhard Saftig, Head of Vertical Glass & Solar Industry

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solar.industry.automation@siemens.com

Focus on SolarIndustry 2011 5
The German Engineering Federation (VDMA) has increased its “efficiency levels” – to use the terminology of the solar industry – by developing in March 2010 an independent division for its members in the PV sector. The current challenges faced by PV engineering are explored in an interview with Dr. Eric Maiser, Managing Director of VDMA Photovoltaic Production Equipment, Ralf Stefes, Head of Business Development OEM at Siemens, and Bernhard Saftig, Head of Vertical Glass & Solar Industry at Siemens.
**Dr. Maiser, what do you consider to be the most important advantages of the new VDMA platform for its companies?**

**Dr. Eric Maiser:** Our platform enables a unified representation of this relatively young industry and helps to emphasize the importance of German engineering for the photovoltaic industry, both domestically and abroad. It is also an ideal forum for interaction between the companies and for forming a strong network of experts.

**Bernhard Saftig:** That’s absolutely right. For industry representatives, VDMA PV is extremely important because its roughly 100 members come from all areas of the PV manufacturing process chain. It includes both small and large companies, with their individual expertise in the field of engineering. We take this opportunity very seriously and I was very pleased to take up one of the positions on the board, and to play a role in VDMA’s work.

**Market conditions for PV engineering are currently exceptionally favorable. Can you give any figures that corroborate that?**

**Dr. Eric Maiser:** With a market share of over 40 percent, German engineering is the global leader in all sections of the value-creation chain. Strong growth in demand for renewable energies will also...
Ralf Stefes: The decisive challenge for PV engineering will be to offer a sustainable reduction in costs by increasing production efficiency. With our Totally Integrated Automation (TIA), we have already set the first standards in this field and will build on this with the new TIA Portal. Communication between all components based on global standards, integrated diagnostics and plant-wide uniform and integrated engineering environments already contribute today to increasing efficiency levels. The open system architecture of Totally Integrated Automation also offers security of investment and allows the implementation of standardized interfaces. Implementation of the data interface SECSGEM/PV2 by partners means the machines can be connected quickly and easily to higher-level MES/ERP systems. This saves time and therefore costs in commissioning. The result is constant availability of all data required in production, meaning a further increase in efficiency and quality in the production process. We are already able to offer solutions today that open up new potential for our customers. Our engineering facilitates the modularization of machine and plant components, for example. Plus, with our modern engineering tools entire production lines can be simulated and optimized. This creates further opportunities for reducing costs, for accelerating development times and for technological improvements to production processes.

Dr. Eric Maiser: I also believe the main challenge will not be so much to demonstrate ever-greater efficiency for cells and modules; rather, it will be to maintain innovation in production. Production did see rapid development over recent years, yet there are still areas of production processes that can be optimized, especially in terms of energy and resource efficiency.
» Production did see rapid development over recent years, yet there are still areas of production processes that can be optimized, especially in terms of energy and resource efficiency. «

Dr. Eric Maiser, Managing Director of VDMA Photovoltaic Production Equipment

How important will the networking of different industry areas be for success in this regard?

Dr. Eric Maiser: Efficient interplay all along the process chain in the future would represent a significant step forward. We have come up with approaches for our PV engineering road map. This would involve two main areas of improvement: firstly, better linking of the individual production stages, and secondly even more consistent automation of individual production processes. This will require closer networking between research, suppliers of materials and critical system components, machine and plant engineers, and the manufacturers. We are well positioned for this here in Germany.

Bernhard Saftig: One the one hand, we are a partner that develops solutions tailored to the industry, in cooperation with engineers. So we therefore contribute to making the engineering competitive in the global market. On the other hand, with our plant-wide automation solutions we form an essential link for addressing the requirements of our end customers. In the end, all plant components must be optimally combined in order to manufacture solar products with greater efficiency, consistent quality and low costs.

Dr. Maiser, Mr. Saftig, Mr. Stefes, thank you for the interview.

Bernhard Saftig, Head of Vertical Glass & Solar Industry at Siemens (left)
Mr. Stefes, Head of Business Development OEM at Siemens (right), and Dr. Eric Maiser, Managing Director of VDMA Photovoltaic Production Equipment (center)
Siemens supports its customers with horizontally and vertically integrated solutions for the automation of processes and production lines – throughout the entire value-creation chain.

What do customers expect from a partner in the solar industry? Innovative and flexible solutions from reliable experts with a global presence are what matter above all. One of the principal features of the Siemens Solar portfolio is that it covers the entire value-creation chain. Siemens supports its customers as a partner with horizontally and vertically integrated solutions for the automation of process and production lines – from the production of raw materials and manufacturing wafers, cells and modules all the way to control and communications systems in field installations. The following is an overview of the core areas of the services Siemens provides.

### 1. Glass manufacturing and glass handling
Standardized and integrated solutions from Siemens accelerate commissioning of production facilities, improve the quality of solar glass, simplify servicing and maintenance, and reduce costs throughout the entire life cycle.

### 2. Thin-film photovoltaics
The Siemens portfolio for thin-film photovoltaics covers the entire value-creation chain, including integrated solutions for automating glass and thin-film processes for individual machines as well as for entire production lines. The offering is complemented by products for field installations and a worldwide service network.
Polysilicon production
With Totally Integrated Automation and Totally Integrated Power, Siemens offers the ideal basis for tailor-made solutions for polysilicon production. The advantages: a high degree of standardization shortens commissioning times, simplifies servicing and maintenance and reduces costs. Siemens solutions ensure that facilities reliably achieve the highest levels of quality.

Ingots, wafers, cells and modules
Whether for process technology or discrete manufacturing, the Siemens portfolio of first-class products and systems covers all aspects of plant automation: from fitting individual machines with automation components to automating entire plants, including reliable operating and monitoring systems and connection to the higher-level manufacturing execution system (MES).

Utilities
For the numerous supply systems within the solar industry, availability is an important issue. Siemens draws on decades of experience in a wide variety of sectors to develop a homogenous overall concept for its customers’ systems.

Field installations
For field installations, Siemens offers tracking systems and inverters that meet the most exacting demands – in photovoltaic plants (PV) as well as for concentrated solar power plants (CSP). The extensive portfolio for field installations ranges from planning support and engineering, energy distribution and industry automation all the way to information technology.
In Sparkling Condition

Setting new standards in the production of polysilicon with the combination of reactors and converters is a considerable achievement – and one that requires first-class solutions for automation. The standardized system design from Siemens proved its worth after just a few months.

The company centrotherm SiTec GmbH, with sites in Blaubeuren and Burghausen, Germany, plans and develops manufacturing plants worldwide to produce the purest polysilicon as well as ingots and wafers for the solar industry. With extensive expertise and experience across the entire value-creation chain, centrotherm SiTec has gained a global market share of around 40 percent for reactors and converters – the key equipment in the production of polysilicon – and an even greater share for complete plant designs. Their customers are always impressed by the capacity of the overall system. The automation solution from Siemens is also accredited with contributing to this success. The Siemens solution features a standardized system design, which enables a smooth integration of the reactor and converter into the control technology of complete polysilicon plants. Thanks to the system’s scalable architecture and open interfaces, centrotherm SiTec can use one solution for both single plants and complete lines. A further advantage is the minimal required level of engineering.

The advantages of internal development

All that, of course, would not matter, had centrotherm SiTec not set new standards in the production of silicon. The company recently presented a new 24-pair CVD (chemical vapor deposition) reactor, which it developed completely in-house. The reactor boasts a considerably higher output of over 350 tons per year and low energy-consumption levels of less than 60 kWh/kg. Thanks to the high level of automation, maintenance requirements and the risk of downtime during production are also reduced. The accompanying high-pressure converter has been adapted to the increase in capacity of the 24-pair CVD reactor, and demonstrates the highest gas throughput rate to date as well as a high conversion rate. The STC-TCS converter transforms silicon tetra-chloride (STC) into trichloro-silane (TCS) and thereby enables feedback of the process gases into the CVD reactor. The resulting closed production circuit lowers manufacturing costs and uses resources more effectively for overall more efficient production.

Automation standards for all polysilicon plants

centrotherm SiTec, a fully owned subsidiary of the TecDAX-listed company centrotherm photovoltaics AG, uses automation systems from Siemens. “Our customers expect reliable production processes that offer the highest levels of technological safety,” says Dr. Albrecht Mozer, CEO of centrotherm SiTec. “To guarantee the quality of the final product, we use automation systems from Siemens.” The automation for the new reactor model and converter is based on the process control system Simatic PCS 7. In the future, the new automation solution will be standard for entire polysilicon plants from centrotherm SiTec.
SiTec. “We wanted to develop a special solution with standard components that would be flexible and could be adapted and optimized to suit our customers’ various requirements,” explains Gerhard Schlosser, Head of Instrumentation and Control at centrotherm SiTec GmbH. Siemens was responsible for the project’s software engineering including the factory acceptance test, commissioning, and building and installing the control cabinet and local cabinets. As some of the systems were installed in areas with a risk of explosions, the control cabinets had to be engineered with the appropriate explosion precautions. For local operation of the reactor, a special explosion-proof operating panel is used. In order to guarantee maximum system availability and integrate safety tasks simply into one platform, an automation system with high availability and integrated safety technology is used. The safety functions were configured with the Simatic Safety Matrix. 

Our customers expect proven production processes that offer the highest levels of technological safety. To guarantee the quality of the final product, we use automation systems from Siemens. «

Dr. Albrecht Mozer, CEO of centrotherm SiTec

Overview of services from Siemens

- Automation of the new 24-pair CVD reactor and accompanying high-pressure converter with Simatic PCS 7
- Software engineering including factory acceptance test and commissioning; building and installing the control cabinet and the local cabinets
- Integrated safety technology

info contact www.siemens.com/solar-industry solar.industry.automation@siemens.com
The year is 1916. The Polish chemist Jan Czochralski (1885 – 1953) narrowly misses his inkbottle and plunges his pen nib into a crucible of molten tin instead. This absentminded error resulted in the birth of the so-called Czochralski method, the basic principles of which are still used today by Confluence in its headquarters in St. Louis, Missouri. The method allows the production of monocrystalline silicon ingots in a crystal pulling system, and with this technology pillar lengths of over two meters are possible. “Confluence’s founders realized that the Czochralski growth method could be used to cost-effectively grow monocrystalline substrates if used in a semi-continuous production mode instead of the prevailing batch production method. The company’s own HiCz™ process works semicontinuously, halving the cost of producing monocrystalline silicon for photovoltaic cells while increasing quality levels over batch processes,” explains Gerry Cahill, Chief Logistics and Information Officer at Confluence Solar.

**Fast-tracking to market launch**

After proving that its HiCz™ process technology was commercially viable, the company wanted to begin large-scale production as soon as possible. To do so, it had to fast-track implementation of the pulling system for growing silicon crystals. To ensure the system operated efficiently Confluence sought...
Three reasons why Siemens sealed the deal

- The concept met all technical requirements
- The PCS 7-based solution was competitively priced
- Siemens was prepared to support Confluence in expanding its resources and ensured commissioning within the tight schedule of just six months

Getting the best out of PCS 7

Gerry Cahill and Bia Henriques are pleased with the results so far. “We’re a company of about 30 people, not an IT house,” says Cahill. “Our core competency is growing silicon crystals. We needed a company that could take on responsibility for IT and adapt the software to our specifications without using too much of our own scarce resources.” Henriques echoes Cahill’s statement: “We didn’t merely want someone to supply us with products and leave it to us to figure out how to use them within our HiCz™ process,” she says.

One of the main advantages with PCS 7, according to Bia Henriques, is that she and her team were assisted with incorporating the extensive knowledge and experience of the company’s crystal-pulling system operators into the process control. It was then possible to map this knowledge and experience in specially adapted software modules in the PCS 7 Advanced Control System Library so that the process control could be tailored precisely to the requirements of the crystal-puller system.

Full speed ahead

While careful not to reveal the technical details of the company’s patented HiCz™ technology, Cahill and Henriques stress an important point: “The PCS 7 is absolutely essential to making our HiCz™ crystal-pulling technology work.” The facility has been in operation since the end of 2010 and an expansion in production capacity is already well underway with a further 20 pulling systems to be commissioned in St. Louis. If this were not enough, a new plant is being developed in Clinton, Tennessee, and a Korean licensee has now also opted for Confluence technology. Of course it is no secret that Siemens will also be on board for all of these future projects.

Prioritizing openness

A cornerstone of the HiCz™ process is an open architecture, according to Bia Henriques, Senior Control Systems Engineer at Confluence Solar. “We wanted to make our process control system as open as possible so we could integrate a great deal of communication protocols,” she says. “We also wanted to be highly independent of any single software or supplier.” A further advantage of an open architecture is that it allows the system to be expanded and adapted easily, so new requirements can be met with flexibility. Which is just as well, since Confluence is continually developing the pulling process in order to optimize the technology.

Together with Frost Electric Inc., a longtime Siemens channel partner in the St. Louis area, Siemens offered a bid built around the open architecture of the Simatic PCS 7 process control system. Confluence was convinced. The bid encompassed hardware and software as well as engineering, programming and consultation for the Advanced Process Control and the Model Predictive Control (MPC). System integration, training and commissioning were also included.
Float-glass production began in the fall of 2009 at the new f | glass facility that was constructed in only 15 months’ time. Located in Osterweddingen, near Magdeburg, the new plant sets global standards – not only for its fast construction time but also for its process and systems engineering. Wolfgang Räbiger, Technical Director at f | glass, gives an insight into the company: “We manufacture glass with a very low iron content specifically for the solar industry, all in one single production facility. The site includes a float facility, cutting lines, coating processes for large glass panels and our solar glass center, where we give the glass specific properties that are important in the solar industry. Especially in this area we have broken new ground in machine technology, particularly for solar applications.”

**Furnaces as a technological highlight**

One of the plant’s technological highlights is to be found right at the start of the process. “We wanted to create a furnace that could do everything,” explains Wolfgang Räbiger. “It needed to be able to melt normal glass, white glass for construction and solar glass, while also being energy efficient and durable.” The new melting furnace is a dual-chambered, regenerative cross-fired furnace with six gas-operated pairs of burners.

For Dr. Thomas Belgardt, Director of Glass Refinement at f | glass, the quality of the company’s suppliers is paramount: “We were not only concerned with the technology provided, but were also looking for a long-term partnership. After all, we hope to still receive competent support in 10 or 15 years. That is why we opted for market leaders in all areas.”

**State-of-the-art energy recovery**

The modern site at Osterweddingen is one of the world’s first glass production facilities to recycle a large portion of waste process heat. The system’s core component is a compact industrial steam turbine provided by Siemens with a nominal capacity of...
2.5 MW. This allows f | glass to recover energy from exhaust gases, which is used to provide electricity to the systems. f | glass can therefore save on energy costs as well as benefit from greater process reliability.

Reliable control systems

The control systems in Osterweddingen were implemented by Siemens Industry Partner STG and are based on the current Version 7 of the process control system Simatic PCS 7. Plant operation is performed via five Simatic WinCC clients, an engineering station and a web server. The operating level is connected to the control system’s two redundant servers via Industrial Ethernet.

The system bus is also based on Industrial Ethernet. The vat, floating bath and roller-cooling furnace are each controlled by an individual PCS 7 AS 416 automation control system. Visualization for the top roller and the EMS technology are also integrated within the PCS 7. Reversal switching is redundant and is controlled by the furnace automation system and a lower-level Simatic ET 200M in the automation system in the float bath. “We are very satisfied with the installed technology,” says Wolfgang Räbiger of the control systems. “The dedication and commitment of the Siemens specialists have been decisive factors for the project’s success.” The f | glass facility in Osterweddingen has an annual gross output of 255,000 tons of float glass. At the beginning of 2010, production was launched on the Magnetron coating line, which can coat around 6 million square meters of glass a year. Around 80 percent of the production output is shipped to the building construction sector; however, in the next five years the share of ultra-white glass and solar glass is to be increased to approximately 50 percent. Thanks to its high-performance production technology, the specialists are optimally equipped for the job.

» The dedication and commitment of the Siemens specialists have been decisive factors for the project’s success. «

Wolfgang Räbiger, Technical Director at f | glass GmbH
The Reis Robotics Group from Obernburg am Main, Germany, joined the photovoltaics industry around six years ago, and has since developed into the global market leader in systems solutions for solar module production. More than 100 installed plants with a total production capacity of over 5.5 GWp are testament to the firm’s success. The over 830 staff members who work for Reis – the largest systems company in Germany – develop and produce systems for practically all module manufacturers across the globe. The offering covers all models and sizes, from simple manual and semi-automated systems all the way to fully automated, turnkey large-scale plants. A modular and scalable (in clusters with 15, 25, 50, 100 MWp capacities) approach allows module production tailored exactly to the operator’s needs. The most recent large-scale plant planned and developed by Reis has a capacity of 300 MWp. It produces packed and delivery-ready solar modules from mono- and poly-crystalline cells in alternation, with an unparalleled cycle time of less than 20 seconds.

A smooth transfer of knowledge

Reis Robotics’ market-leading position is based on decades of experience as systems integrators for automation solutions in all major industries, particularly the automobile industry. The company specialized in combining their core competences in the areas of robotics and logistics with systems engineering from renowned suppliers and with the latest integrated automation technology from Siemens.

Thanks to collaboration with other suppliers, it is possible to integrate, for example, their stringers, laminators and flashers quickly and smoothly into any overall solution. Wherever specialists see potential for optimization, they set about developing new solutions. This is how innovative alternatives were developed for, among others, the (patented) laser soldering method for cross connections, encapsulation with liquid silicone, film trimming and direct installation of the terminal box. The box makes it possible to achieve greater availability, process reliability and/or product quality. Furthermore, the liquid encapsulation method allows improved energy efficiency and durability of the solar modules.

A modular approach to an efficient solution

A state-of-the-art integrated modular platform was developed to generate individual system solutions to meet any requirements, which simplifies the design phase and allows fast production. In practice, this modular platform includes tried-and-tested modules with self-contained control and handling technology for all production stages.

Should customers require, the supplier will also install an MES/SCADA system based on Simatic
WinCC (in the current 7.0 SP2 version), which features a transparent and tractable design for the highly complex processes and operations in large-scale plants. This is one of the first systems to use the advantages of Windows 7 and therefore offers the long-awaited option of more convenient operation via multi-touch.

Profinet now standard

A core component of each of these modules is Siemens’ modular embedded controller Simatic S7-mEC-RTX F. There were good reasons for choosing an embedded system with the structural design of the Simatic S7-300: first and foremost extensive interface equipment for Profinet and industrial Ethernet, high computing power in the PC unit, and scalable memory. Robustness and reliability also play an important role in achieving high plant availability. As there are no revolving parts such as fans and hard disks, long-term reliable operation is assured, even under demanding conditions. Another important criteria was that it should be possible to manage all automation functions with the familiar tools and languages of the Simatic Step 7 – from engineering to diagnosis.

One of the main challenges faced in recent large-scale plants was providing data modules of up to 40 megabytes in order to save the enormous data volumes locally for a period of 12 hours. Reis employs a strategy of double data storage on the controllers and in the front-end SCADA system to keep track of processes at all times.

Full use is also made of the range of interface functionalities. The controllers communicate via Profinet-equipped Scalance switches with each other, with various local drive systems and with other units, such as Simatic MV420 code reading systems for product tracking with barcodes. Sometimes up to 220 devices are connected to an

» Because we can use Profinet for system areas, all communications tasks are now considerably less prone to errors. That is very important for high availability of all system parts. «

Paul Merz, member of the Management Board and Head of Sales at Reis GmbH & Co. KG Maschinenfabrik
embedded controller, which is currently something no other field bus system can handle. The controllers are also connected via their gigabit Ethernet to an independent network for data transfer with the MES level. Quality control requires that image files from line-scanning cameras, with sizes of up to 800 megabytes, be compiled rapidly and transferred immediately to the front-end image and data servers and then made available for the final sight check – all with a cycle time of less than 20 seconds. The process is handled by two separate gigabit Ethernet networks. Security modules from the Scalance S family safeguard against access from outside parties.

Security included

The error-proof embedded controllers with real-time capable Soft-PLC WinAC RTX F also take care of security tasks, such as the monitoring of protection doors, emergency stop control, lighting grids and other such systems. This highly flexible solution eliminates the need for separate security hardware as well as a great deal of wiring. Security-relevant signals are transferred together with the I/O signals for sequence control via Profinet and the Profisafe Profile.
Decentralized converters connected via Profinet

The decision to use Profinet communication from now on in all areas – including Reis Robotics’ own linear and articulated-arm robots – was implemented with the help of the world’s first decentralized, Profinet-capable frequency converter system Sinamics G120D. The compact device in protection class IP65 is perfectly designed for use without control cabinets and for controlling and regulating asynchronous motors in the conveyance lines along the sprawling module production facilities. It integrates digital input and output for the simple, direct connections of sensors and actuators locally, and is also available in an error-proof version. In the world’s first 300 MW large-scale plant, completed by Reis Robotics, around 750 of these decentralized frequency converters were installed and connected via Profinet. These drive the same number of Motox geared motors from Siemens. The modular system design based throughout on Profinet proved its value right from the start in the extremely demanding environment of a module production facility. It is therefore also fully ready for implementation in any other of Reis’ new business areas.

Achieving high capacity together

Paul Merz, member of the Management Board and Head of Sales at Reis GmbH & Co. KG Maschinenfabrik

"Staying ahead of the competition in the photovoltaics industry in particular requires high plant availability, right around the clock. A decisive factor in achieving this is worldwide and prompt availability of spare parts and support on-site in order to keep downtimes short and output high. With Siemens as a globally established and renowned partner, we are in a strong position in this regard.

Siemens has the technology and products required for all applications. The company also provides support when necessary, ensuring we can develop and implement even highly complex large-scale plants in short time frames. It’s great to have this on-site support, especially when we are introducing several new products that all need to be connected with each other. This is a great advantage to us, and helps us stay a step ahead of our competitors.”

Overview of services from Siemens

Reis Robotics relies on integrated, coordinated automation technology from Siemens. The core components of the extensively standardized production modules include:

- The Simatic S7-mEC-RTX F modular embedded controller
- The Sinamics G120D decentralized frequency converter
- Motox SC geared motors
- Simatic ET200S/ET200eco decentralized peripheral units
- Simatic operating units (OP/TP177/277, MP277)

Several interfaces, high computing power, robustness and integrated security were decisive arguments for the modular embedded controller Simatic S7-mEC-RTX F

info contact

www.siemens.com/solar-industry
solar.industry.automation@siemens.com
Schott Solar Thin Film GmbH, Germany

Codeword: Quality

Thanks to code-reader systems, PV manufacturers are now better equipped than ever to continually monitor all parameters across their production processes – an important prerequisite for maintaining high product quality.

Solar cells and modules are technology-oriented products, which means prices are sinking in line with swift developments in the industry. PV manufacturers are therefore making increasing efforts to reduce production costs while improving quality with optimized production processes. Case in point: the Schott Solar Thin Film GmbH production site in Jena, Germany. The company began manufacturing thin-film solar modules based on amorphous silicon in fall 2007. In the meantime, the plant has developed average daily output levels of 1,000 thin-film modules per day for an annual production capacity of over 33 MW.

Early days: temporary labels with barcodes

Back when the company began manufacturing modules, industrial coding with data matrix codes (DMC) was still in its teething stages, so module production was tracked using temporary labels with barcodes. "In the raw module division we work with virtual tracking. Real tracking is only used in the finished module division," explains Kay-Uwe Jahn, Project Manager for Servicing and Maintenance at Schott Solar Thin Film GmbH. "Mistaken allocations in both databases were evident across the entire production line and sometimes these were only discovered right at the end." In some cases, serial numbers that had been entered by hand did not match up exactly with those on the modules and led to mismatches and considerable extra work. In other cases, numbers appeared twice and the allocation in the manufacturing execution system (MES) failed. Kay-Uwe Jahn adds, “Obviously we want to prevent false entries or tracking errors, so we decided to swap the barcode solution for a code-reading system with optical character recognition (OCR). This allows us to utilize the plain-text serial number written directly on the module right at the start of the production process, and no additional coding is required.”

Simatic MV440 code-reading system

When it came time to select the right code-reading system, the project managers spoke with consultants from Siemens, who developed a customized solution in collaboration with experts from iiM AG.
Data security and transparency thanks to industrial identification systems

The stationary 1D/2D code-reader systems Simatic MV420 and MV440 not only guarantee exceptionally high reading accuracy and speeds, but also offer very flexible interfaces. These include, for example, Profibus, Profinet, Ethernet, RS232, and digital inputs and outputs.

The Simatic MV420 and MV440 can be configured flexibly and individually by the user. The decoder algorithms reliably recognize and read printed, lasered, drilled, stamped, etched or pin-stamped codes – at any rotational position.

Further features of the MV440 include the Multicode Reading function (reading up to 50 codes per imaging frame), and simultaneous reading and comparison of OCR plain text and machine-readable 1D/2D codes in one imaging frame. The OCR software is easy to operate and does not require training. The reading device can be parametered in just a few minutes by selecting the required basic settings. The code system can reach a speed of up to 1,000 readings per minute, making it suitable for high-speed applications. No additional software is required for commissioning and network integration.

“Our experience with Simatic systems over the years was very good, so we decided to work with Siemens again on this contract,” explains Kay-Uwe Jahn. As the provider of around 95 percent of all control systems for the module manufacturers, Siemens has over the years become an important partner for the industry. “We chose an OCR solution that allows production inspection and batch tracing, and which also increases the quality and security of the data.” After reviewing all options, Schott decided on systems from the Simatic MV440 product family. The code systems not only offer a fast and uncomplicated solution, but they are also part of Siemens’ Totally Integrated Automation (TIA) framework, which means they can be integrated seamlessly and with minimum effort into the existing automation solution.

info contact
www.siemens.com/solar-industry
solar.industry.automation@siemens.com
Mr. Riccardi, RoviSys Asia has a special relationship with Siemens. After all, Siemens played a role in the foundation of RoviSys Asia, didn’t it?

James Riccardi: Yes, in a way that is true (laughs). Back in 2006 our parent company RoviSys took on a project for a large multi-national nutritional company building a new plant in Singapore. That was one of our largest integration projects with Siemens to date. We delivered Simatic S7-300 and S7-400 modular controllers. And at the end of the project the subsidiary RoviSys Asia was founded.

Why do you use Siemens products?

James Riccardi: Siemens is able to offer variety. The product portfolio provides the necessary flexibility and the right scale for every application. This provides value to our customers over a wide range of applications.

What has it been like to work with Siemens?

James Riccardi: Our cooperation has been a great experience for us – and hopefully for Siemens too. We are one of their preferred system integrators, and Siemens currently provides the largest automation control platform that we use in our projects. The support is very good, especially here in Singapore. Siemens has always given us quick and expert assistance in critical situations.

Which solutions do you use in particular?

James Riccardi: We use the Simatic PCS 7 process control system, which we are very satisfied with. It offers us and our customers the flexibility to do exactly what is required at all times. This is unfortunately not always the case with other control systems, and possibilities can be limited.

Which projects have you used it for?

James Riccardi: We delivered the automation and control systems, for example for the Facility Management Control System for REC’s photovoltaic plant in Singapore. It was a major Simatic PCS 7
installation consisting of three redundant operating systems and a redundant single-mode fiber-optic network for long-distance data transfer, connected to 34 remote I/O panels. This network enables connectivity and communication with all I/O panels distributed across the 800 by 800 meter site. The Simatic PCS 7 is the central station and has interfaces to all production areas including the fire protection system, power monitoring system and other utility systems at the plant.

Were there any special requirements?

James Riccardi: REC’s main requirement was that there should be no outages. The site is in continuous operation and cannot risk shutdowns, and shutting down the utilities would have a major impact on production.

Did everything go smoothly?

James Riccardi: The interfaces to all elements across the plant evolved over the course of the project. One of the servers, though, was so overworked that a system overload occurred.

How did you solve the problem?

James Riccardi: We diagnosed the problem with Siemens’ assistance, and their technical experts from Singapore and Germany helped us to complete an analysis. The Siemens team made valuable recommendations that we then implemented. Essentially, the solution was to incorporate more servers to share the extra load. The main challenge was to take care of the work – installing the new servers, rerouting the data traffic and implementing the changes – without interrupting the plant’s operation. Everything went smoothly thanks to help from Siemens.

RoviSys has around 200 employees in the United States and 25 in Singapore. Photo: the project team for the REC contract

Preferred system integrator

RoviSys is a system integration company based in the United States with a focus on Life Science, Glass, Power & Energy, Chemical, Building Management, and MES projects. Its subsidiary RoviSys Asia, headquartered in Singapore, operates in the vertical markets of the pharmaceutical, electricity and energy industries, as well as in the glass industry, with projects in Taiwan, South Korea and Japan. RoviSys employs around 200 people in the United States and 25 in Singapore.
The key to cost- and energy-efficient production is precise measurement and regulation of resource consumption. As energy costs rise, this topic becomes a major factor for supply systems in photovoltaic factories.

Certain stages within the solar industry production chain can be highly resource and energy intensive. Various process steps in the solar industry require large amounts of water in various degrees of purity, special gasses and fuels such as natural gas. In addition, all waste water must be appropriately treated. Measuring devices for flow and fill levels, positioners and process-gas chromatographs for monitoring gas quality all provide important information and contribute to low energy and reduced operating costs. A prerequisite for achieving optimal balance between these variables, however, is that the right device is used for the job.

**Flowmeters for every application**

The Sitrans F M electromagnetic flowmeter is the ideal solution for most cooling-water applications in the solar industry. Thanks to its robust design, it requires practically no maintenance. The device monitors all functions independently and provides immediate warning in the event of a disruption. Its flexible design means it is even suited to all types of corrosive fluids and chemicals, such as sodium hydroxide (NaOH).

The Sitrans F US ultrasonic flowmeter should be used for combined cooling and heating applications. It can measure energy consumption even at low electrical conductivity levels or in the presence of sediment, such as magnetite. With Sitrans F US, operators can retrofit measuring sensors under pressure using clamp-on or hot-tap technology for in-line sensors – a highly cost-effective solution.

**Positioners that require minimal air**

Compared with other positioners, the Sitrans VP300 and Sipart PS2 score extra points with their ability to reliably control a very broad spectrum of valves. Unlike conventional electro-pneumatic and pneumatic positioners, these digital controllers from Siemens require minimal air – thanks to advanced technology. Operators using Sitrans VP300 and Sipart PS2 save on energy and maintenance costs because reduced air intake means less compressor activity is necessary to produce the required air pressure. And last – but by no means least – lower CO2 emissions also means increased environmental benefits too. The two clever, low-maintenance positioners also come equipped with extensive standard diagnosis functions. To warn operators of potential malfunctions, the Sitrans VP300 and Sipart PS2 continuously check the actuator and valve.

**Efficient gas analyzers**

Customers benefit from Siemens’ decades of experience in the areas of natural gas chromatographs. As the first company to use micro-electro-mechanical
systems (MEMS) for process gas chromatography, Siemens offers unbeaten performance characteristics. Gas suppliers guarantee a certain degree of gas quality – albeit only within a certain range. Yet even minimal fluctuations have an effect on combustion performance. Monitoring gas quality online enables operators to adapt burners with their process control systems. As a result, gas consumption can be reduced significantly. The mark of a good gas chromatograph such as the robust and compact Sitrans CV is that it measures the calorific value of natural gas quickly and precisely. This is an important parameter for monitoring supplied energy amounts, and it has a direct impact on gas bills. Sitrans CV itself features low energy and gas consumption levels.

An integrated solution for an integrated solar factory

Numerous customer references show that the products offered by Siemens deliver results. For example, Siemens provided process instrumentation for a new ultramodern solar-wafer manufacturing facility. The factory in Singapore has a central supply system for all media, plus a central system for heating, ventilation and air conditioning in the building. The utilities supply the site with cooling water, hot water and the necessary gases. The waste water is also treated on the factory premises.

Siemens supplied Sitrans L fill-level instruments as well as Sitrans FM flowmeters with MAG 6000 and MAG 3100 transmitters. Other Sitrans flowmeters, such as vortex and orifice flowmeters as well as clamp-on instruments, were supplied for the various areas of application. This range of solutions shows that process instrumentation and analytics are increasingly an indispensable component for smooth operations in the solar industry.

Sensor systems from Siemens: intelligent, robust, precise and reliable

As an automation partner with deep industry and technology expertise, Siemens offers an extensive and complete portfolio of sensor systems for various applications within the solar industry. All products and systems set new standards in their disciplines. And with their precision and reliability, they offer Siemens’ solar customers a competitive edge.
Focus on Solar Industry 2011

When France’s largest solar park in Les Mées was connected to the grid in August 2011, representatives from Siemens were able to look back on three years of intensive work – their commitment had clearly paid off. Jean-Charles Brun, Business Development Manager at Siemens Energy, recalls: “We held the first talks with Eco Delta three years ago, and then in July 2009 the first contract was signed.” The contract was of considerable scope, with Siemens Energy acting as an engineering, procurement and construction (EPC) contractor, and even providing maintenance, operative and guarantee services.

Everything from a single source

In an installation period of just ten months, six individual PV plants were developed over a total area of 66 hectares. These will now provide electricity for more than 12,000 households in the Alpes-de-Haute-Provence region in the south of France. Yet the tight schedule was just one of many challenges that the Eco Delta contract presented. “The topography at Les Mées is very complex and hilly,” says Jean-Charles Brun. “So we had to come up with a perfect plant design that took into account both the terrain as well as the demands for extremely high levels of efficiency and capacity.”

A strong partner

Siemens developed a comprehensive concept and worked in close partnership with Eco Delta on this monumental project. “Never before have we undertaken a photovoltaic solar plant project of this scale. This 31 MWp project has been one of the most exciting and challenging projects I’ve ever handled,” says Jean-Pierre Frantin, Project Director. “We managed to install 112,400 solar panels in just five months, covering a surface of 66 hectares, the equivalent of 92 football fields. We installed a total of 4,000 tons of equipment – roughly half the weight of the Eiffel Tower or the equivalent of 18 Airbus A380 planes,” continues Frantin. “The Siemens in-house EPC expertise and state-of-the-art technology for inverters, transformers, medium-voltage switchgears and a digital control system were major factors in making this project a success.”

Inverters par excellence

By using Siemens inverter modules, customers benefit from over 20 years of international experience. With a market share of 40 percent, Siemens
Industry is the market leader in France in the segment for central inverters. Since 2008, as much as 250 MW have been installed in France, and in 2010 alone 150 MW were supplied. “The scale of the plant in Les Méès presented us with a considerable challenge,” explains Daniel Lazzaroni, Head of Energy Sector at Siemens Industry. Finally, we settled on the Sinvert PVS500 model series in a master/slave combination. Sinvert PVS is a product series that is specially designed for the power plant segment and for capacities of between 500 kW and 3,200 kW.

With a peak efficiency of up to 98.7 percent, the modules have excellent performance ratings. The master/slave method, where up to four devices can be connected to one unit, allows a uniform usage of all components and therefore a long life expectancy. It was also possible to optimize efficiency levels thanks to improved calibration of the nominal capacity of the inverters, in line with the output from the connected fields. “A further advantage was that we were also able to offer plant monitoring with WinCC software and Sinvert Select software for configuring the plant, all developed by us,” explains Daniel Lazzaroni.

Dotting the i’s

The joining of forces under Siemens’ leadership meant it was even possible to achieve a size of 31 MWp instead of the originally planned 30 MWp – which was a positive aspect for Eco Delta.

Advantages of Siemens Energy

Siemens Energy is the world-leading provider of a wide spectrum of products, solutions and services for energy production, transfer and distribution, as well as for the exploitation, conversion and transport of the primary fuels oil and gas. As the world’s sole energy infrastructure manufacturer, the Siemens sector has acquired exhaustive expertise in all areas of the energy conversion chain.

Overview of Siemens services for Les Méès

- Professional project management
- Engineering with balance-of-plant optimizing
- Inverters
- Distribution boxes
- Plant monitoring with WinCC software
- MV and LV switchgears
- Transformers
- Maintenance, operating and guarantee services

Working together toward a shared goal: Jean-Charles Brun (left) and Daniel Lazzaroni representing the Siemens Energy and Industry sectors
Kemper Solar GmbH, Germany

Keeping Track of the Sun

Network-compatible mini-controllers with a web server efficiently and cost-effectively control and visualize solar trackers.

Biaxial solar trackers that follow the sun’s course are not an invention of Kemper Solar GmbH. Nonetheless, the family-owned company based in Vreden, Germany, is treading new paths in the automation of its solar-tracking constructions that are designed for long and dependable operation. The company depends on the modular and scalable Simatic S7-1200 compact control system from Siemens. Simatic S7-1200 is one of the first to include a Profinet IO interface. And thanks to the interface, solar trackers can be easily integrated into an Ethernet network and either locally or remotely monitored from a central location.

Solar park shows the many possibilities of the trackers

In 2010, in order to display the many possibilities of its trackers, Kemper Solar created and equipped “Solarpark Vreden” at the site of a largely decommissioned waste water treatment plant. The company financed the project itself, and brought the park online. Since then, 20 solar modules with surfaces between 60 m² and 80 m² (total of 1,450 m²) and equipped with the Kemper tracking system, KemTrack, have been producing around 250,000 kWh of CO₂-free electricity. Each of the 20 trackers has its own Simatic S7-1200. There were several...
reasons for choosing the modular compact control system: The successor of Simatic S7-200, which is integrated in many Kemper facilities, had already proved its effectiveness in the company’s dedusting units. Along with its solid construction for industrial applications, the controller offers a range of functions and possibilities that are not standard in its price category, for example the already mentioned Profinet IO interface. In addition, the device is equipped with all the inputs and outputs necessary for the application.

A highly efficient inverter

Using visualization software Simatic WinCC flexible, Kemper developed an easy-to-use graphic interface that clearly displays the operating conditions of all parts of the facility and that permits targeted manual intervention. The comprehensive Siemens product portfolio enables universal automation of solar trackers from one source. Of the solutions in the portfolio, Kemper uses among others the Sirius position switch to limit the tracker’s rotary movement in the end positions for the unlikely event of a controller failure, as well as the electronic solid-state relay to indirectly switch the driving load.

Sinvert PVM10 solar inverters from Siemens with a peak efficiency of 98 percent (EU 97.4 percent) are largely responsible for the park’s high energy yield. The three-phase 10-kW inverters are housed in casings with protection class IP65. This feature makes the devices suitable for open-air use, directly on the tracker masts, in ambient temperatures of -25°C to +50°C. The robust devices do not require an external ventilator, which makes them low maintenance and leads to a low total cost of ownership.

Automatic tracking including backtracking

The automatic, biaxial trackers are operated according to an astronomical algorithm for the respective location, independent of weather conditions. The algorithm is available as a function block library for Simatic Step 7 Basic, and it can be easily integrated in the application program. As a result, compared to fixed systems, electricity yield is up to 40 percent higher, depending on location. Along with this regular tracking feature, the so-called backtracking prevents the modules from blocking out one another during low sunshine angles. This feature accounts for further performance optimization.

Cost efficient and widely available

Growing cost pressure in the PV sector requires constant development. “Every individual component has to be tested regularly,” stresses Alexander Lenfers, head of Kemper Solar GmbH. From the beginning, Kemper recognized a good market opportunity with a balanced mix of robust equipment and reliable automation technology for the entire facility lifetime of 20 to 25 years. And when it came time to source the automation technology, the solar experts found a tailored solution at Siemens. “In order to guarantee the availability of our tracker systems for years to come, we also have to think about the availability of spare parts and support around the world. As a mid-sized company, we have made the right decision in choosing Siemens as a partner,” say Kemper’s technology experts and business heads.

Web server and WLAN on the way

Kemper is also striving to make its trackers – which were successful from day one – better and more efficient. As a result, the company is actively involved in the next wave of innovation. With the current firmware version 2.0, the Simatic S7-1200 now has an integrated web server. This feature means that any control and status data on pre-configured HTML pages can be easily retrieved. The data can be accessed using a web browser, so that no additional software is needed.

“This is a really lean and efficient solution to commission solar trackers even without engineering software, or to call up current operating conditions from anywhere. And in the other direction, naturally with respective authorization, it is possible for example to adjust the elevation axis up or down,” says Georg Hanke, who is responsible for automation technology at Kemper. Large solar parks as well as smaller parks with just a few trackers can be operated, visualized and diagnosed with little effort. In some cases, this feature means that classical on-site operation is not necessary, since visualization is possible via a network, web server and web browser from any PC, netbook or even a PDA/Smartphone.

A transition to wireless networking via Industrial Wireless LAN (IWLAN) and WLAN bridges means a further reduction in installation and wiring expeditures. The experts in Vreden are also considering a bundled transmission of operational and yield data using IWLAN and WLAN. Siemens has an extensive portfolio for industrial uses, such as Industrial Wireless LAN Access Points and Client Modules.

Special requirements also have to be fulfilled by the communications solutions in use – in regard to consistency, integration capacity, transparency and speed. Thanks to their industrial compatibility, the Simatic Net products from Siemens are optimized for the functions important for such communications solutions. With the industrial Ethernet switches available in the portfolio, larger network structures with fiber-optic lines can be realized at any time.

Info contact

www.siemens.com/solar-industry
solar.industry.automation@siemens.com
The results are quite impressive: In Spain’s sunny south, already 13 CSPs (Concentrated Solar Power) are in operation today. Eight more are currently under construction and many more are on the drawing board. Experts predict a more than 30 percent increase of installed MW per year until 2015. The reasons are obvious: Since the Spanish government started using a feed-in compensation model in 2002, the market has developed accordingly – and Siemens was and is almost always involved in ensuing projects. And in comparison to the Fresnel, solar-tower and dish-Stirling systems, the technology for parabolic trough power plants is the most mature and prevalent. In fact, more than 90 percent of all CSP facilities worldwide use the parabolic trough system.

Mirrors and heat storage method
With parabolic trough systems water is initially heated with solar energy. The water is turned into steam that powers a turbine, whose generators create electricity. Using mirrors, the sun’s energy is concentrated on a small surface to obtain high temperatures. In the focal line of these mirrors, which follow the sun’s movements, are receiver tubes. A heat transfer fluid – a special synthetic oil is most commonly used at the moment – flows in these receiver tubes. The fluid is heated up to 400°C and transfers its heat via an exchanger to water, which turns to steam and drives the turbines. An alternative to the thermal oils are special salts, which can be heated up to 550°C and thereby increase a facility’s efficiency. In order to produce

Process instrumentation for solar-thermal power plants, Spain

A Perfect Configuration

Whether pressure, temperature, flow or fill levels – Siemens offers a comprehensive portfolio of field instrumentation for solar-thermal power plants. This expertise is in especially high demand at parabolic trough facilities in Spain.
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**An overview of field instrumentation from Siemens for CSP facilities**

- Solar field: temperature and pressure gauge Sitrans T, Sitrans P as well as S7-1200 plus T-Card
- Storage: temperature and pressure gauge Sitrans T, Sitrans P as well as filling-level detector Sitrans LR250 or LG200 plus a fill-level switch like Sitrans LVL200
- Power plant unit: temperature and pressure gauge Sitrans T, Sitrans P as well as flow measurement device Sitrans F X
- Water-treatment facility: Probe LU, Sitrans F US, Sitrans F M

Electricity at nighttime, many solar-thermal power plants are equipped with storage systems. The steam can be contained either in heat-insulated pressure tanks or with a further storage media. Currently, a common media is the same special salts that can be used in the receiver tubes. If salt is used as the carrier and storage media, a heat exchanger in the power plant is not necessary. As a result, investment and operational costs are lowered.

**The added value of field instrumentation**

These technological setups pose several challenges for field instrumentation. The high temperatures of the heat transfer fluid, for example, require intelligent solutions in the solar field, in storage areas and in the power plant unit. In addition, every solar-thermal power plant needs a water purification system, which holds yet another challenge. But whatever the scenario, Siemens offers an optimal solution. Reliable temperature, pressure and flow measurements on the entry and exit of the solar field support stable operations. Normally the receivers are connected in series so that the failure of one unit means that the entire unit collapses. To prevent this from happening, the temperature of the carrier fluid is measured. If it is within a certain range, the respective thermal properties exist to ensure the functionality of the collectors. The situation is similar for pressure: because a continuous flow of oil or salt has to be ensured, with the help of measurements possible fluid loss can be detected. In the power plant’s storage area, temperature as well as steam pressure have to be measured, and continuous monitoring of the oil or salt levels in the tank is also necessary. The temperature and pressure measurements of steam condensation in the power plant unit itself are particularly important. In solar-thermal power plants water is always involved, whether it is potable, filtered, osmotic or demineralized. As equally varied are the applications of water: among others for the cooling system or for cleaning the parabolic reflectors. In order to perfectly fulfill all needs, Siemens relies on its proven solutions for water treatment.

**Everything under control**

Whether pressure, temperature, flow or fill levels – altogether Siemens offers comprehensive field instrumentation for solar-thermal power plants using parabolic trough technology.

**Info contact**

www.siemens.com/solar-industry
solar.industry.automation@siemens.com
Solar Vertical Market Management (VMM), Georgia, USA

Central Hub

The new Solar Vertical Market Management (VMM) group in Norcross, Georgia, forms the nerve center of Siemens Industry’s company-wide PV and CSP network in the United States. This is good news for customers in the American market, who benefit from this focus of expertise in applications for the solar industry, all from a single provider.

Stability and a closely meshed structure are the defining features of a good network. These two qualities are the backbone of the Solar VMM group, founded in October 2010 in the United States by Siemens Industry, Inc. The team, led by Senior Director Richard Myers, forms the hub of an expert network at Siemens where the group’s technical know-how is concentrated. “Our customers really appreciate having a central contact point in the United States for all their needs when it comes to photovoltaic and concentrated solar plants,” observes Richard Myers. “It is very important that we not only offer highly advanced expertise but that we can also provide the right products and services throughout the entire value-creation chain – from single components all the way to complete solutions,” adds Myers.

Highly integrated solutions from a single provider

This setup creates several advantages for end users, OEMs and EPCs: operating costs are lower, market launch times are shorter and the general level of quality is higher. The Solar VMM sees its principal function in actively approaching clients, informing them about the latest products and offering precisely adapted and highly integrated solutions. Providing this sort of intricate customer-relations service requires the highest degree of expertise and is only possible because a great number of sectors, divisions and business units work together with the Solar VMM. The Solar VMM leverages the combined solar capabilities of the five divisions of Siemens Industry – Industry Automation, Industry Solutions, Drive Technologies, Mobility and Building Technologies – and integrates the solar capabilities of Siemens Energy, Inc. to provide customers with the full scope of Siemens technology and innovation for solar energy production. An example of this tight collaboration is a recent project where Siemens Energy is providing state-of-the-art turnkey project management and engineering for a 2.8 MW photovoltaic plant, while Siemens Industry is supplying the electrical components.

The success of the Solar VMM speaks for itself: three out of four of the largest solar parks in the United States, with a total installed capacity of over 100 megawatts, rely on technology from Siemens.

Just what the customer ordered

Confluence Solar, a U.S.-based company, has developed its own method for single-crystal growing. And PCS 7 from Siemens ensures that everything functions precisely and according to plan. Confluence Solar’s facility has been in operation since the end of 2010 and an expansion of production capacity is well underway. Read more on page 14.

Working in partnership with business units in Germany, Siemens Industry, Inc. received a contract to equip a 48-megawatt solar plant, located in Boulder City, Nevada, about 40 miles southeast of Las Vegas. Completed in late 2010, the installation includes 96 of Siemens Sinvert 550kw inverters, and now generates enough renewable electricity to power about 14,000 average homes.

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www.siemens.com/solar-industry
solar.industry.automation@siemens.com
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Visit www.siemens.com/solar-industry to deepen your knowledge and get more out of this magazine. An interactive map acts as a virtual guide through the value-creation chain in the solar industry, illustrating solutions offered by Siemens in each area. Our video about solar energy also brings this information to life for you in an engaging presentation. Product sheets and brochures provide more information on the individual topics.

This magazine is available online in both English and German, and it can be downloaded as a PDF. You will also find last year’s issue at the site.

Are there any other services you would like to see on the website? We look forward to any feedback you may have.
Can we use the sun as efficiently as nature can?

With efficient concepts in manufacturing and intelligent products for field application, you will follow a great example in terms of efficiency.

The sun’s potential in the global energy market is growing. We have set our goal on growing alongside and offering concepts and technologies for maximizing the sun’s economic yield. Together with our customers, we are in the constant process of developing the perfect solutions to maximize energy efficiency in production and to sustainably increase the effectiveness of solar technology. [www.siemens.com/solar-industry](http://www.siemens.com/solar-industry)

Answers for industry.