Continuity in progress

Interview with Eckard Eberle and Hans-Georg Kumpfmüller
Continuity in progress
Networking, digitization, intelligent plants: Eckard Eberle, CEO of Industrial Automation Systems, and Hans-Georg Kumpfmüller, CEO of Sensors and Communication, discuss which of the current trends are shaping developments in process control technology and engineering (page 4).
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Editorial
03 Looking to the future together

Cover
04 Continuity in progress
Interview with Eckard Eberle, CEO of Industrial Automation Systems, and Hans-Georg Kumpfmüller, CEO of Sensors and Communication

08 Secure the future, grasp opportunities
The vision of Industry 4.0 in the process industry

Engineering
10 Virtual commissioning in practice
Pilot project with virtual commissioning at BASF SE

14 The next level
The new release of Comos Generation 10

17 From the measuring point to the equipment
Integrated engineering with Comos and Simatic PCS 7

18 Gaining time
Integrated engineering at BMA Braunschweigische Maschinenbauanstalt AG

Process Control Technology
20 Virtual automation with real advantages
Virtualization in process control technology

22 The most powerful controller in the world
The new Simatic PCS 7 CPU 410-5H

Pharmaceuticals
24 Continuous quality
Sipat for melt extrusion processes

26 MBA for MBR
A new solution for electronic master batch record management

Process Instrumentation
28 Just once instead of several times
Integrated engineering for process instrumentation with PIA Life Cycle Portal

30 Standard for device integration
New standard simplifies field device integration

32 A window into the field
Simple integration of intelligent field devices with the Sitrans Library

33 Instrumental to safety
Functional safety in process instruments

Process Analytics
34 A new device generation
The new series 7 of Siemens process gas analyzer devices

Dialogue
35 Newsletter, online, preview
“Looking to the future together”

As a partner to the process industry, we know that our solutions must contribute to lowering the total cost of ownership of a process plant. We have been developing such solutions for many years now; we presented our portfolio for the optimization of processes throughout the system lifecycle at ACHEMA 2012, for example. And now we must continue this pursuit.

At the NAMUR annual general meeting (AGM) on November 7 and 8, we will be demonstrating the progress we have made – for example, in the area of integrated engineering. We are convinced that the progressive digitization and networking of industrial value-added processes is not only bringing a fundamental change to the industry, but will also leverage productivity. As a partner of the 76th NAMUR AGM, we will be taking the opportunity to present and demonstrate innovative solutions that address the entire plant lifecycle, showing how individual process steps can be intelligently linked and the complete production process optimized. To achieve this optimization, we offer a broad portfolio of high-performing and “intelligent” tools for the integration of planning, operation, and maintenance. We have set ourselves a clear objective: to support our clients in shortening their product launch times by up to 50%.

One thing is clear, however. Without the close and cooperative partnerships with our clients, we would never have been able to develop our products and systems thus far. For this reason, we highly value the ongoing dialogue with our clients and partners – at events like the NAMUR AGM, but also in day-to-day communication during projects. In this way, we can master current challenges together and also develop answers to questions to come. This is an important aspect of partnership: looking beyond the daily business and into the future together. We have been following this cooperative approach for many years now, and you will discover some of the results in this issue of process news, focusing on technologies all around digitization and integrated engineering. We would like to give you a glimpse of what is already possible today and offer you the first taste of what the coming years have in store for us.

Enjoy the read!

Axel Lorenz
Director of Process Automation
Industrial Automation Division
Siemens AG
Innovation in process control technology

Continuity in progress
Integration, digitization, intelligent plants – these are the catchwords that will describe the future of industrial production. In the process industry, too, new approaches and opportunities are changing working methods in all phases of the plant’s lifecycle.

Eckard Eberle, CEO of Industrial Automation Systems, and Hans-Georg Kumpfmüller, CEO of Sensors and Communication, explain how current trends are shaping developments in process control technology and engineering.

Mr. Eberle, the process industry has the reputation of being an especially conservative industry. Nevertheless, or perhaps precisely for this reason, digitization and virtualization are at the moment topics of heated discussion. With integrated engineering, NAMUR has also chosen a digital theme as the main focus of this year’s annual general meeting (AGM). Why?

Eckard Eberle: Industrial production has been experiencing a comeback all over the world. This signifies that competition is increasing. Companies must develop new products more quickly, bring them to market more quickly, and reduce development and production costs over the long term – without cutting corners on quality and safety. Without the seamless integration of development, engineering, and operation, and without high-performance software tools and modern automation, these goals can only be achieved with the greatest difficulty – and this applies to the process industry in particular.

Seamless integration always sounds good, but what does it actually mean in concrete terms?

Eckard Eberle: Take the plant design phase. The individual units were still designed manually in the 1980s, on the drawing board with paper and pencil, and in some cases even with real models made out of plastic. Changes were made by hand, which was an extremely time-consuming and error-prone process. Nowadays, of course, the appropriate planning tools are used – Comos, for example – to collate all the data relevant to one unit or object into one data-
Thus, every employee working on a particular project can make use of the current planning status at any time. The next step was to more closely integrate process engineering and automation. With integrated engineering, planning time can be further reduced, and, at the same time, project quality can be improved. What this means, in the end, is that the plant can go into operation more quickly.

Is this subject relevant only to plant engineering, or is this approach more far-reaching?

Hans-Georg Kumpfmüller: In terms of digitization, we are taking a holistic approach. We have therefore consistently expanded our portfolio over the last few years and are now able to support virtually the entire plant lifecycle – from the initial concept to modernization. And we take all levels of process automation into account, right down to the integration of field devices. The PIA Life Cycle Portal provides the user with automatic suggestions of appropriate Sitrans field devices, based upon design data available in Comos. Further integration ensures that the relevant device data are present for later planning and project phases, which supports commissioning, plant operation, and planning of servicing and maintenance.

Talking about commissioning: This is a particularly critical stage of the project, especially in the process industry, whether one is dealing with a modernization project or a completely new plant. How can digital tools help?

Eckard Eberle: The safety of plants and employees is absolutely essential in the process industry, and for this reason, tests carried out on actual plants, which always carry a certain risk, are increasingly being replaced by virtual plant testing in the context of cold commissioning. We are currently working in a pilot project with BASF and M+W on new ways to make commissioning even safer and more efficient – and we are exploring new ways to test process variations without any risk or disruption to operation.

Simulation and virtual commissioning are an important element of integrated engineering and a key factor in improving the profitability of process plants throughout their entire lifecycle. Hans-Georg Kumpfmüller: Process engineering is only one part of the picture. Automation accounts for only a relatively small part of the total plant investment cost. As process engineering plants can have an operational life of up to 40 years, there is great cost savings potential in performing modernizations during operation.

And how can software tools help with this?

Eckard Eberle: With the plant documentation, for example. The long operational life of a process plant requires the operator to continuously maintain plant documentation. With digital plant documentation, changes can be carried out automatically, even during operation – an invaluable advantage for servicing and modernization. Plant operators can access not only current but also planned data via continually updated documentation, and they have all the information necessary for servicing and maintenance (or for the expansion of an asset) electronically available, including documentation, design data, and history. These data are even directly available on-site, at the plant itself, via mobile devices.

"With digital plant documentation, changes can be carried out automatically, even during operation – an invaluable advantage for servicing and modernization."

Eckard Eberle, CEO, Industrial Automation Systems
The long lifecycle of process plants leads to other issues that need to be addressed. How can companies be sure that they are going to be able to integrate new assets or tools into the existing landscape at a later date?

Hans-Georg Kumpfmüller: The key lies in open and standardized interfaces that support systems from different manufacturers. We are working closely with the appropriate standards bodies in order to be able to offer a good and future-proof solution from the customer’s point of view. We have already made great progress – in the area of field devices there are standardized integration technologies such as EDD or FDT/DTM but the actual improvement in the area of field devices will be brought on by the comprehensive FDI technology. This nonproprietary technology and its dedicated standardized tools will make device management much simpler in the future. Siemens will present a FDI beta version at the NAMUR AGM 2013.

Eckard Eberle: Naturally, we also ensure that our own system components are perfectly matched to one another. Our products are open and connectible to other systems and devices in order to enable our customers to choose the best solution for their requirements and to get the most out of their investment. In the integration of process engineering and automation, for example, Comos and Simatic PCS 7 will be supporting the standardized eCl@ss exchange format beginning in 2014.

This brings us to the question of future developments. What do the next few years have in store for us?

Hans-Georg Kumpfmüller: With the tools and systems currently available, companies already have many possibilities for optimizing processes, reducing costs, and generally reacting more quickly and with greater agility. But we will not stop here. We have already discussed one challenge for the future: how we can develop systems and interfaces so that the investment bears fruit over decades.

Eckard Eberle: Digitization will also continue to progress. One of the themes of the future will certainly be how hardware and software can be made to merge more closely throughout the complete production chain, and how we can transfer intelligence in plants even further, as in Industry 4.0. The changes in the process industry should be looked upon as evolution rather than revolution, and the result of constant development work. We have a long history in the process industry, and we have been supporting some of our customers for decades. Partnership, continuity, and innovation are not just slogans for us, but rather the guiding principles of our collaboration with our customers. Events like the NAMUR AGM are an ideal opportunity to discuss with users how to increase the profitability, efficiency, quality, and transparency of their plants – and I am already very much looking forward to the discussions and presentations.

Mr. Eberle, Mr. Kumpfmüller, thank you so much.

“With the tools and systems currently available, companies already have many possibilities for optimizing processes, reducing costs, and generally reacting more quickly and with greater agility.”

Hans-Georg Kumpfmüller, CEO, Sensors and Communication
Manufacturing companies are facing numerous challenges: energy and resource efficiency are becoming increasingly decisive factors for competitiveness; innovation cycles are becoming shorter and markets more volatile. The vision for Industry 4.0 addresses these challenges with the development of intelligent, integrated production units – which will also have an impact on the process industry.

The term “Industry 4.0” was coined in Germany because the subject forms a fundamental part of the high-tech strategy of the German government. The underlying concept of an “Internet of things” can be found worldwide, however, in relation to the future of industry. As a global company and technology leader, Siemens will play an important role in shaping the future of industry. Developments that focus on Industry 4.0 will make a contribution.

The concept behind Industry 4.0 is that, in the future, plants will consist of intelligent, autonomously operating production units (cyber-physical systems, CPS) by means of interdisciplinary engineering. The company-wide networking and interaction of CPS turn these intelligent plants into flexible value creation networks. But in order to make this vision a reality, some challenges must still be overcome. The prerequisite is an infrastructure that provides a flexible access to information not only at the plant but also beyond. Production resources and products must have their own intelligence in order to perform functions independently, and digital and real plants need to merge.

Some prerequisites for this already exist, while others still need to be further developed or are yet to be conceived. For this reason, Industry 4.0 will not immediately become a reality in day-to-day production in the process industry. Nevertheless, experts are sure that companies in this industry will be part of this innovative and flexible value creation network – although to varying degrees, based on the sector and processes involved.

Intelligent units

The omnipresent communication between CPS requires correspondingly powerful communications networks that connect all levels of the plant and that still meet industrial requirements, such as, for example, Profinet. This increased networking means, however, that the protection of IT systems and
networks from attacks and disruptions will play an increasingly important role. Security certification of communications components and defense-in-depth industrial security concepts are essential. Siemens has already devised suitable solutions for this purpose, which will be further developed in the future.

An important issue for the operation of a process plant will be how autonomy and self-organization can be reconciled with the high availability and security requirements of process automation. The flexible production described by Industry 4.0 can be best conceived in a batch environment. Intelligence that is correctly applied can even increase plant availability. For example, intelligent production units are already providing their current technical status and at the same time processing the maintenance information of components such as valves, pumps, heat exchangers, and even complete plant sections. These data are further processed as part of asset management. Preventive maintenance concepts, such as the Simatic PCS 7 Maintenance Station, will thus be more closely linked with planning and plant management data in the future – for instance, with the Comos MRO module for service and maintenance planning. This will contribute to a reduction in downtime and a further increase in productivity. As products and production resources become ever more intelligent, mechanisms for the integration and exchange of more complex information must be in place. The plant’s automatic “plug and play” at the field device level is supported by simple integration mechanisms, as are plant modules such as package units. Here, domain-specific object models will play an important role. Modular control system approaches, based on these object models, are also conceivable, with the capability to display material flows and integrate MES functionality via automation integration.

The digital and real worlds

The merging of the digital and real worlds in the process industry means that plants and products must each always contain a corresponding model. This model describes how and why a product or a plant was conceived, developed, produced, and used. Each physical object must contain an explanatory model, that is, a formal description of its characteristics. The Siemens Digital Enterprise Platform concept, with its comprehensive approach to the plant lifecycle through the phases of process development, plant engineering and construction, commissioning, operation, and maintenance, is already achieving this engineering vision for Industry 4.0 in the context of Siemens product portfolios. Today, Comos planning software, for instance, can already transfer data directly into automation engineering in Simatic PCS 7. As the quantity and complexity of information continues to increase, simulation tools such as Simit will become indispensable not only for plant design, but also for engineering tests and for training. And, as plants become ever more flexible, processes and operating conditions must also be simulated in order to establish the optimum operating point. Tools for Advanced Process Control will play a crucial role.

Investment in the future

Although the time horizon of Industry 4.0 can still not be precisely defined and the design phase is not yet entirely complete, companies should set their course for the future – and this is especially important in the areas of industrial communication, security, maintenance, MES, simulation, and the Digital Enterprise Platform. Today, Siemens is already offering a wide array of products and solutions that will serve as an important foundation for a reference architecture in the Industry 4.0 environment.
Virtual commissioning in practice

Virtual commissioning lies at the heart of the vision of a fully integrated engineering process. Together with Siemens and M+W Process Automation GmbH, BASF is taking the first steps toward this goal and is employing Simit as the tool for virtual commissioning for a process automation migration project.

Cost-effectiveness and time to market are driving factors behind the continuous optimization of engineering workflows in the process industry. Integrated engineering can make an important contribution, as it assists in the closer integration of the individual steps of plant engineering, automation, and commissioning, and in making them more efficient. In particular, the simulation of the simplified behavior of process plants in virtual commissioning can significantly increase engineering efficiency.

A pilot project at BASF

BASF is currently conducting a pilot project together with Siemens and M+W to make the vision of virtual commissioning of a process plant a reality. BASF and Siemens have already cooperated successfully in the past on innovative issues in process control technology, such as priority-based alarm concepts.

In the virtual commissioning pilot project, BASF is now testing an automation application in a virtual plant, which maps plant behavior with the help of a simplified process model in a simulation environment. “With virtual commissioning, we can test the automation software intensively, both during normal operation and also, to some extent, in exceptional situations,” explains Dr. Michael Krauß, senior automation manager at BASF SE. As a first step, BASF focused on cold commissioning in a virtual plant: “In practice, plants are often cold commissioned in order to perform the final tests before the start of production. During the piloting, we carry out the engineering and the factory acceptance test conventionally as well as within the framework of virtual commissioning.”

“The sooner an error or design flaw in the software is discovered, the lower the costs are to correct it.”

Dr. Michael Krauß, Senior Automation Manager, BASF SE
“With virtual commissioning, we expect an early start-up of the plant to increase productivity and return on investment. To do this we must achieve high quality in automation already during the engineering phase.”

Dr. Michael Krauß, BASF SE
miliarize themselves with a new control system in a very short time. With virtual commissioning and the possibility to create a low-cost process model, we can integrate and train our operators at an early stage."

But virtual commissioning not only helps detect errors early in the implementation of automation logic, with a resulting increase in the quality of the software; the settings of hardware drivers, synchronization of step chains, alarms, and interlock strategies can also be tested very effectively with this procedure. "And the sooner an error or design flaw in the software is discovered, the lower the costs to correct it," emphasizes Krauß.

Key aspects of engineering processes

Those responsible for the project at BASF believe that virtual commissioning will soon be an integral part of engineering processes. Krauß predicts: “The complete engineering lifecycle, not only for greenfield, but also for migration projects, will experience significant evolution in the coming years – in particular in relation to Industry 4.0, with the introduction of cyber-physical systems, which will also bring about changes in the process industry in the long term. Simulation will become an increasingly important tool. The combination of plant planning systems and tools for simulation and virtual commissioning, such as Simit, are of particular interest for virtual commissioning. We want to have direct access to planning data and to automatically develop a large share of the plant topology in a simulation program in order to generate a simplified process model. As the next step, we would like to be able to test load flexibility at a steady state operating point while the process model is being honed." With Comos, Simatic PCS 7, and Simit, Siemens offers a complete portfolio for planning, control systems engineering, and simulation. This gives plant operators a foundation upon which to unify the complete engineering workflow – and to give integrated engineering an increasingly concrete form.

BASF SE will be holding a workshop at the 2013 NAMUR general meeting on the subject of piloting virtual commissioning. Please get in touch with us if you are interested in the results.

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The new release of Comos Generation 10

The next level

The Comos software solution administers project-relevant data, offering the ideal foundation for higher productivity when planning and operating process control plants. With the latest software version, which has been available since October, the enhanced Comos Generation 10 provides the process industry with a major increase in efficiency.
The Comos 10 software generation is a model of integration, interoperability, and innovation. The current release of this solution now offers even greater interoperability of disciplines and software, and, thanks to its innovative technology, allows the virtual inspection of plants from the very first planning stages. The Comos enterprise platform has been further developed with this current release, Comos 10.1. The integrated data hub is adaptable to the requirements of specific industries, ensuring that the ever-increasing amounts of project data will be edited quickly and managed securely in the future, too. The user benefits from reduced customizing expenditures and simpler installation, and consequently from a significant competitive edge.

Easier integration of pdf documents in P&ID

The newly released Comos Generation 10 also increases the level of integration in pipeline and instrumentation design (P&ID). Pipeline and instrumentation flow diagrams in pdf format can now be simply linked with a process flowchart in Comos P&ID or even transferred as a complete file. All the data from the pdf design are then available in Comos and can be matched to existing rule-based objects. When necessary, the components in the Comos data bank can be reedited, which significantly reduces the effort for inventory transfer. For systems engineers, who often take over pipeline and instrumentation flowcharts from subcontractors, manual mapping is greatly simplified or even becomes unnecessary thanks to the new import function in Comos.

Information flows across software suites

The planning of process plants involves many disciplines and specialties. Interoperability is the key for effective operating sequences. Data and documents must be exchanged easily and securely between different software applications, locations, and teams. Comos makes this possible with its open system architecture and standardized interfaces. Innovations to

“An attractive feature with tangible benefits”

Users can profit from Comos Walkinside throughout the complete lifecycle of the plant – from the very moment a 3-D plant model is available. With Walkinside, a periodic design review with all project stakeholders and parties involved can be performed in the virtual plant environment during engineering. The progress of the project is illustrated and documented clearly. And even before commissioning the plant, realistic training can take place in a safe environment. This is why customers from the oil and gas industry, for example, use Walkinside for training purposes. Even while a major oil production facility, such as an off-shore oil platform, is still under construction, the future operating teams can begin to familiarize themselves with the plant. This also includes the simulation of accidents. The crews can start their work simultaneously with the commissioning of the plant, so drawn-out test runs are greatly reduced. Maintenance procedures can be realistically simulated with Walkinside during operation and precisely planned. Maintenance engineers can see in advance where and how plant components are installed and assess their accessibility. Complex maintenance work – for example, on oil platforms – can be meticulously planned on land and then effectively implemented. This increases safety and saves money, time, and nerves.”
Comos PipeSpec provide improvements such as simplified and accelerated data exchange with third-party programs and an update to XMpLant import possibilities. Here, the compatibility with Probad, IBM’s calculation software for the design of pressure parts, has been expanded. Bidirectional data exchange of pipeline specifications, including revision management, now allows for a further increase in data quality and engineering efficiency.

The new process data interface ensures improved information exchange between product and system design, with which the user can more efficiently synchronize components and catalogues between Comos and the Siemens Teamcenter PLM (product lifecycle management) software. System structures from 2-D systems engineering with Comos are cross-matched and exchanged in a consistent manner with 3-D design in NX, the product development solution based on Teamcenter. Teamcenter allows company-wide, global access to product information throughout the complete system lifecycle.

Innovative 3-D system visualization

The new software release offers an innovation in plant management with the further development of Comos Walkinside. The high-performance 3-D visualization software virtually but realistically maps systems of any complexity before their commissioning. The software draws directly on the data stored in Comos. The 3-D image of the system is always kept up-to-date, throughout the complete lifecycle, by means of logical combinations of geometric objects with engineering data. The use of head-mounted devices (HMDs – virtual reality glasses) and gamepads for the control of virtual characters creates an almost perfect impression of being inside the actual plant.

For every component in the plant, from valves to pipelines to pumps and motors, actual information can be accessed in the virtual world in real time. All object-related data records, such as parameters, safety reports, maintenance information, handbooks with P&IDs, function charts, and so on, can be accessed directly from the virtual object. This visualizes information and simplifies the processes for everyone involved in the engineering and operation of plants. New features, such as the easy segregation or color marking of objects in the virtual model or the simulation of fires or gas leaks, expand the already numerous possibilities of this software solution.
The data and information exchange between process engineering and control system project planning was already highly optimized in the previous software version with the bidirectional interface between Comos and the Simatic PCS 7 process control system. The current release of Comos Generation 10 seamlessly and rigorously continues this development. After the delivery of hardware configurations, system structures, and type-based data exchange to individual control levels, functionally engineered sequence controls (types and instances) can also be transferred to the process control system as plant-specific automation functions. This ensures considerable time and cost savings in the overall plant engineering.

**Transfer of functional units**

In addition to the purely individual control levels at measuring points and actuators, this next integration stage allows the definition and transfer of equipment modules – in other words, functional units and their mostly sequentially described behavior. In this way, the behavior of a device type can be described functionally, taking variance into account. This functional behavior is then translated into a template for the automation function via the interface. The instance-specific characteristics and the possible variants are functionally planned with the same efficiency and transferred to the control system as a completed automation function. The planning of the actual unit takes place by assigning a measuring point to its functional role. This facilitates not only project planning, but also consistency control and maintenance.

**Simplification not only in engineering**

This approach supports the standardization of plant component types from a functional viewpoint and also simplifies validation processes as well as subsequent operational support. Additionally, this approach offers plant owners the chance to discuss, to plan, and, above all, to document automation and process engineering on a uniform abstract level, which not only supports an integrative view of the plant, but also secures all the plant documentation.
Gaining time

How much time can integrated engineering save? This is not the decisive question for Patrick Eisfelder, manager of the engineering department at BMA Automation GmbH. For him, integrated engineering is a way to gain valuable time – for the actual project.

From Braunschweig, Germany, to the world: BMA Braunschweigische Maschinenbauanstalt AG (BMA) develops, designs, and builds machines, equipment, and plants for the processing of sugar and other renewable raw materials. BMA Automation GmbH, one part of the BMA Group, designs and implements automation solutions, not only for processes and machines, but also for individual assembly units. “Our clients want to get a complete solution fast,” said Patrick Eisfelder, manager of the engineering department at BMA Automation. “That applies to everything from the original concept to the design and engineering stages to the provision of services such as replacement parts and maintenance. At the same time, the proportion of projects where we deliver turnkey applications is growing.”

Uniform data management and good documentation

“Our challenge is that we want to offer our clients a good solution. Part of that is enabling clients to resolve routine problems and perform common tasks themselves, with the help of our documentation. This means that maintenance and commissioning information is made available from the data that are produced during the engineering phase.” It is for this reason that BMA uses the Comos plant engineering software, not only during plant engineering, but also during automation engineering. According to Eisfelder, a particular characteristic of BMA is that the company plans the process plant and also realizes the appropriate automation solution: “In this way we profit especially from the tight integration of engineering processes. With Comos, we no longer have the problem of two teams working on different versions of...
a project. A classic example is the versioning of drawings. In the past, the automation team always had to take the results of other planning processes into account. Now I just have to call Comos up, and everyone in the project is working with the same set of data. This takes pressure off the team and eliminates a very common source of errors in the project.”

In Eisfelder’s experience, the integration of engineering processes also raises new issues: “The technical solution is one thing. Bringing people from different disciplines together and having them work more closely together is another. A process engineer might assess and designate a measuring point differently than an automation engineer. For this reason, processes and designations must be adapted and standardized.”

The close collaboration of disciplines improves understanding of the complete process, however, and encourages the exploitation of synergies. “Due to the fact that we use Comos in such an integrated manner,” he says, “process engineers must put perhaps 10% more work into their part of the project – but on the automation side, we can as a consequence ultimately save 50% of the effort if, for example, we receive a pump with all the relevant data from Comos already in Simatic PCS 7.”

Focusing on the application

There are two large projects in progress at the moment, where both the plant and the automation are being designed with Comos and the data accordingly transferred to Simatic PCS 7. Eisfelder is expecting tangible results in terms of synergies after the project’s completion: “For us, the principal benefit lies in the fact that we are able to minimize errors in the project. In addition, we are able to deliver a solution for a project request faster – our aim is to generate about 60% of a plant from typicals in Comos. This means that the project basis can be built by means of standardized components, enabling our engineers to save a lot of time and allowing them to make better use of their knowledge by dealing with specific plant and process requirements. At the same time, this approach supports us in the acquisition of new contracts – we can visit the client with a solution that is already very detailed and provides a sound basis for discussions about the particular project.”

Specific figures are not yet available, but Eisfelder is sure that the work with typicals in Comos and the automatic data transfer between Comos and Simatic PCS 7 will further simplify engineering: “With the rapid reproduction with Comos, we expect that we will be able to save up to 25% of the effort in the creation of typicals, in addition to the opportunities that Simatic PCS 7 already offers today for efficient engineering. However, I don’t believe it is enough to consider only the savings, because for us the decisive factor is that we gain time – for specific inquiries, for the actual process, for our projects, and for our clients. Naturally, we will also be evaluating the two projects on the basis of key performance indicators. At the moment, however, the most important task for us is to bring the projects to completion successfully and to deliver to our clients a good, high-quality solution. And the integrated engineering of Comos and PCS 7 gives our teams more time for precisely these tasks.”

Comos and Simatic PCS 7 at BMA

BMA AG has been using Comos since 2006. In plant engineering, Comos is used for basic and detail engineering; in the future, the company will also be working with Comos for pipeline planning. Plans are also being drawn up for the implementation of the 3-D virtual reality visualization software Comos Walkinside.

BMA Automation has been using the Simatic PCS 7 process control system since 2007 and this year implemented the use of the Comos EI&C module for electrical engineering and the logic module for functional planning. And now BMA Automation is profiting from the fact that the two systems can be optimally integrated, achieving a continuous workflow from engineering to operation.
Virtualization

Virtual automation with real advantages

Virtual worlds have become a feature of industrial automation thanks to information technology. Running a production plant in a virtual environment – with the Simatic PCS 7 process control system, for instance – is a complex task. However, virtualization can help sustainably optimize operating costs.

The term “virtualization” originated in the world of IT and describes the emulation of hardware, operating systems, data storage, or networks. Emulation allows computer resources to be logically divided and clearly mapped, or virtual operating systems to be run within a host operating system. This IT world is penetrating industrial automation to an ever-increasing degree – and with it comes the potential to also transfer some of its key benefits, especially cost savings, to the world of manufacturing. Production plant operators are under particularly heavy cost pressure and demand low investment costs, rapid set-up and commissioning, and smooth operation with no loss of production. Thus, the question is how virtualization can best be transferred into the world of manufacturing.

Investment in technology and know-how

Virtualization solutions require an initial investment for host systems, virtualization software, maintenance agreements, and possibly for air-conditioning and noise control, too. Whether this investment is economically viable over the lifecycle of the plant in question must be determined in each individual case. The user must take numerous factors into account, for example, space and energy requirements, remote access, the division of space at the plant, the existing infrastructure, the running of other applications, such as evaluation tools, and information and report systems in the virtual environment.

In addition to the investment, two things are critical for the success of a virtualization solution: dedicated IT and process know-how. Standard IT functions cannot simply be transferred automatically to the manufacturing plant. In addition, particular servers must be highly available in a manufacturing plant. The distribution of redundant servers to various host systems helps avoid single points of failure.

Virtualization in process automation

<table>
<thead>
<tr>
<th>Benefits and opportunities</th>
<th>Challenges and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduced hardware costs</td>
<td>• High initial investment</td>
</tr>
<tr>
<td>• Improved scalability</td>
<td>• Specialized IT knowledge</td>
</tr>
<tr>
<td>• Stable system environment</td>
<td>• Divided responsibilities</td>
</tr>
<tr>
<td>• Reduced TCO</td>
<td>• Higher security expenditures</td>
</tr>
<tr>
<td>• Higher levels of standardization</td>
<td>• New potential for error</td>
</tr>
<tr>
<td>• Increased flexibility</td>
<td></td>
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<td>• Easier expandability</td>
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The IT world develops at breakneck speed – driven by ever more complex software, which requires ever greater hardware resources. With virtualization of systems, this challenge can be met, as not only can administration, space, and service be optimized, but cost savings can be achieved as well, through more efficient utilization of resources such as CPU performance and storage space.

Pioneers in the industry

Various industries have already seized upon the opportunity presented by virtualization, including the pharmaceutical industry. Here, an extensive product range demands frequent switches in production, which require close interaction with IT. Validation is another requirement of particular importance in this sector. In the past, several computers had to be purchased, already at the initial investment stage, as replacement parts for a validated plant. These costs disappear with virtualization.

Another example is water resource management. The typical characteristic in this situation is the geographic and also hierarchical distribution of the plant, with regional and district authorities granted remote access to the central waterworks. With virtualization, the complete control system server infrastructure is consolidated into one computer center. Up to 50 web clients access one virtualized web server. The PCS 7 user concept enables access authorization between clients in the main control room, at higher-level regional and district control rooms, and at on-site touchpanels. With shared use of the data center, all locations involved enjoy considerable cost savings.

Continuous virtualization facilitates administration

The office world accesses virtualized long-term archives and reporting systems via web mechanisms. Administrative effort is considerably reduced by means of continuous virtualization from the office to the production plant. And this applies across all sectors. Before deciding for virtualization, however, each individual case should be evaluated to establish what benefits can be achieved with what technical components and in what kind of structure. When the result is compelling and the staff is well trained, the initially high investment will be returned over the lifecycle of the plant.

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The most powerful controller in the world

Siemens has expanded the Simatic controller family with a more powerful, flexible, and rugged CPU, using a totally new concept. The Simatic PCS 7 CPU 410-5H is currently the most powerful controller on the market, and it covers all applications and performance ranges with a single hardware and firmware platform.

The new Simatic PCS 7 controller is designed for plants equipped with the Simatic PCS 7 process control system in the current version 8.0 SP1. In many ways, it continues the success story of the Simatic S7-400 controllers. It shares, for example, the same design. The airless and rugged design and high quality requirements in the manufacture of the controller guarantee a long working life in the harsh conditions of everyday industrial use. In daily round-the-clock continuous operation, it withstands extreme temperatures, vibrations, and EMC impacts. Furthermore, the PCBs and electronic components now receive a special coating at the factory for increased protection against environmental influences. This increases operational safety and plant availability.

While a comprehensive, performance-graded CPU spectrum is available with the complementary S7-400 central processor units (CPU 412 to CPU 417), the Simatic PCS 7 CPU 410-5H is based on the concept of a single hardware and firmware unit. The scope of its performance can be individually defined to match the application using a system expansion card (SEC). The SEC determines the maximum number of process objects (POs) that can be downloaded onto the CPU. The spectrum ranges from 100 POs to more than 2,000 POs. The controller itself is always supplied as a high-end version in terms of memory, diagnostic buffer, and communication and computing power.

Secure and highly available

The Simatic PCS 7 CPU 410 has a fail-safe design by default for integrated process safety functions. It is equipped with all the functions for safety-related applications and can be expanded at any time. The controller is TÜV certified and complies with all safety requirements up to SIL 3. The CPU has multitasking capability so several programs can run simultaneously – not only basic process control system (BPCS) applications, but also safety-related applications. The programs are free of feedback, so possible errors in BPCS applications have no impact upon the safety applications and vice versa.

Two redundant, electrically isolated controllers are used to ensure maximum uptime. They can be mounted on a common carrier or operated synchronously at up to 10 km distance from one another. One of the two CPUs acts as
master, the other as slave. Two synchronization modules are used to create redundant coupling, with the two CPUs kept in sync via fiber-optic cables. The modules can be replaced during operation.

**Integrated communication**

The CPU has a 10/100 Mbit/s Industrial Ethernet interface for the connection to Profinet, and a 12 Mbit/s Profibus interface for up to 96 slaves. A second Industrial Ethernet connection is already present in order to be able to support redundant Profinet architectures at a future date. The distributed process I/O can either be integrated directly or via a subordinate fieldbus. In the interest of investment protection, existing PCS 7 installations (V8.0 SP1 or higher) can be updated to CPU 410 with very little effort. A mixed operation with complementary S7-400 CPUs (CPU 412 to CPU 417) is also possible without difficulty. Feature extensions are simply unlocked via firmware updates. The flexible communications structures of the process controller guarantee powerful performance and extensibility far into the future.

### Simatic PCS 7 CPU 410-5H – technical features

- Integrated 48 MB load memory and 16 MB RAM each for program and data
- Cycle time up to 10 ms/9 process tasks
- Total number of I/Os (on Profibus DP and Profinet IO) approx. 5,000
- Additional protection of the circuit board with coating (conformal coating)
- High-precision time stamping
- Recessed RESET button

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Sipat helps to establish Process Analytical Technology in many continuous processes in the pharmaceutical industry. One such process is hot melt extrusion, where active pharmaceutical ingredients are embedded in a polymer matrix. With Sipat, hot melt extrusion lines can be operated according to quality-by-design principles, enabling real-time release of the products.

Since the 1930s, hot melt extrusion (HME) has been widely applied in plastics processing, but this mature technology was not considered as a processing method for pharmaceutical applications until the early 1980s. Since then, the number of patents issued for pharmaceutical HME has risen every year, and, especially during the last 10 years, a growing number of companies have applied HME to incorporate active pharmaceutical ingredients (APIs) into a polymer matrix that can be processed to create edible tablets or integrated into capsules, as HME offers several benefits for drug delivery. However, in order to fully exploit the benefits of HME and continuous processes, the process must use Process Analytical Technology (PAT) that enables quality by design (QbD) and real-time release of the product.

**Process design and monitoring tasks**

HME typically comprises several steps: matrix preprocessing, mixing, extrusion, and strand shaping and cutting. Subsequent downstream processes may in-
clude tablet compression, followed by coating tablets or the filling of the pellets into capsules. Depending on the process variant, a number of parameters need to be monitored in order to determine critical quality attributes (CQAs) or process parameters influencing the CQAs.

**Sipat as a PAT tool for hot melt extrusion**

As process parameters are often interdependent and product quality is defined by more than one process property, these directly available data need to be evaluated using statistical methods and process models. In this context, the fingerprinting of multivariate parameters such as near-infrared (NIR) spectra is a key task for the process modeling and analysis tools used.

One architecture that can be used for the statistical analysis and modeling of pharmaceutical processes is the Sipat software. In an HME process, Sipat can be used to collect the data from the NIR probe to check the blend composition before it enters the extruder, to calculate the API amount and water content through NIR fingerprinting, to monitor the API content in the finished strand through NIR fingerprinting, and to check the strand dimensions. Together with additional process data from the control system, the process information is evaluated using advanced mathematical models. For this purpose, Sipat can be connected to dedicated chemometrical tools.

**A robust and flexible process with real-time release capability**

The results of the modeling are integrated into Sipat and time-aligned so that process and product properties can be mapped with the feed rate. Accordingly, Sipat can provide detailed information on the state of the process and product at a given time and location within the extruder line. This allows manufacturers to implement control strategies that will correct process deviations so that the process and product remain within specifications, or to identify and divert out-of-spec product.

Because the Sipat PAT solution reliably monitors the API concentration in the finished product and can make predictions about process behavior, the HME process can also be flexibly adapted to new formulations or dosage forms. This helps manufacturers exploit market opportunities and produce multiple different drugs in one process. Additionally, Sipat archives process data and can provide both historical and current process information almost instantaneously (the speed is limited only by the acquisition and evaluation speed of the analytical systems and modeling tools used) to support process design or drug development.

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**Hot melt extrusion: benefits**

- Solvent-free process
- Environmentally friendly and economical process
- Dry process that is suitable for moisture-sensitive drugs
- Rapid and cost-effective method for solubility enhancement of poorly soluble APIs
- Ideal process for taste masking of unpleasant-tasting APIs
- Easy, reliable way to achieve prolonged drug release, with reduced risk of dose dumping compared to coated monolithic systems
- Rapid and reliable method of preparing films for strips or patches
- Continuous process that results in fewer unit operations and enables efficient scale-up from laboratory to production
- Intense mixing and agitation to improve content uniformity
- No reliance on compressibility, which is useful for powders with a low compressibility index
- Lower number of excipients required because polymers can be designed to serve multiple purposes
- Greater thermodynamic stability than other hot melt methods, resulting in a reduced recrystallization tendency
Drug quality and safety are essential: the pharmaceutical industry is highly regulated

Electronic master batch record management

MBA for MBR

With growing cost pressure and new regulations, manufacturers and quality managers in the pharmaceutical industry are always looking for ways to improve their processes. A new electronic master batch record (eMBR) solution enables the management of complete paperless manufacturing within regulated processes and helps achieve operational and manufacturing excellence from the design of the batch record to the release of the batch report.

The GMP-compliant definition of production processes is based on master batch records (MBRs) and the associated order-related executed batch records (EBRs). In a paper-based environment, the effort required to create and maintain MBRs and EBRs is huge. By contrast, electronic master batch record management with an MBR/EBR system is based on structured MBRs that are subject to automatic version control and that draw on libraries with reusable building blocks. The application of standardized building blocks makes it much easier for the user to create and maintain MBRs. The system provides the framework to set these up and generates an empty electronic batch record form for data collection during production. The MBR is then distributed to the appropriate systems for execution. In this format, the
Pharmaceuticals | process news 3/2013

manufacturing execution system (MES) is responsible for generation, synchronization, collection, and batch release, while the other systems are responsible for execution and process control. Data are collected from these systems (as defined in the MBR) into an electronic batch record. However, until recently there were no integrated solutions that could bridge the gap between ISA95/ISA88, automation, and manufacturing IT.

**eMBR concept, one step further**

Now, the Simatic eMBR solution for electronic master batch record management offers this native integration between the MES and the distributed control system (DCS) layer using Simatic IT XFP and Simatic PCS 7 and Simatic Batch. This expedites the design, execution, and review steps of MBR/EBR and provides real flexibility in the MBR design. In the DCS, a robust and powerful batch engine manages complex low-level S88.01 recipes related to automatic control of the process. In the MES, an easy-to-use design tool allows users to design processes and implement parametric master batch records without the need for IT skills. Recipe information is available in the MES design tool. MES workflow steps are integrated by simple selection out of the list of released master recipes. Combining reusable process-specific building blocks and out-of-the-box functions allows standardization, reduced development effort, reduced risk, and faster release of the MBR.

**Key benefits**

- **Paperless process:** eMBR can reduce paper use until the system can handle all processes electronically.
- **Reduction of development effort and risk:** integration of the MES and DCS simplifies the architecture and reduces the effort associated with the interface between point solutions, lowering the total cost of ownership.
- **Standardized libraries of process operations:** with reusable functional blocks and parametric MBRs, pharmaceutical companies can harmonize their processes and facilitate global implementation across sites.
- **Single point of review of batch-relevant information:** reviews are faster and safer and enable release by exception.

During production, every operation and resource is controlled, tracked, and traced. All the systems coordinate real-time control at every level, synchronizing operations and sharing parameter values. Process rules and sequences are enforced through the workflow engines. The systems manage all operations, such as orders from the enterprise resource planning (ERP) system, guided manual operations, quality testing, and tracking and tracing of materials and resources.

Alarms and alerts generated during the process are centralized in the MES. All the alarms can be accessed at any time with real-time information. Alerts can be grouped for easier review. This allows the review process to be shortened with reduced risk. Mass data, such as trends, curves, and reports, can be aggregated to be part of the EBR. Process tasks from any system are accessible from any HMI or workstation. Batch records can be constituted and visualized in real time.

Since the MES centralizes all the information, EBRs can be analyzed using exception rules. This means that only potential deviations are flagged, so the review process is faster. The signature path for record review defines the stages before final validation. The review path assigned to the MBR imposes the number of signatures. Simatic eMBR provides additional investigation tools, such as equipment logbooks, a complete audit trail, and a graphical genealogy tool. The Manufacturing Intelligence tool allows the reporting, monitoring, and analysis of critical data for the batch and across batches, facilitating process improvements and operational excellence.

**Master of flexibility**

Depending on the context, the strategy, the system landscape, or the processes to cover, there are multiple ways to deploy a fully automated MBR/EBR that satisfies the requirements of both primary and highly automated processes and secondary processes involving many manual operations. Simatic eMBR has the flexibility to support many different approaches, always offering the benefits of tight integration between the MES and DCS and simplifying the overall technical architecture and its configuration. This solution is especially designed to be able to accept DCS-driven approach: From an already existing PCS 7 environment, the Siemens eMBR solution can bring additional MES functionality (such as interface to the corporate ERP, material tracking and tracing, complex electronic work instructions, MBR/EBR reporting capabilities and so on) in a very integrated and flexible way, with minimum modification of the existing DCS/batch installation.

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With PIA Life Cycle Portal, Siemens simplifies the integration of process devices in planning and maintenance tools. The portal for the selection, planning, ordering, commissioning, and maintenance of process instrumentation and analytics is fully integrated into Comos and thus enables seamless integration of device characteristics over the entire lifecycle – from engineering to modernization.
Current practice in the planning of new process plants is largely based on sequential operation. Various subsections are developed totally independently from one another, and they must continuously be aligned to each other in a time-consuming and costly way. Another point is the selection and ordering of field instruments. Here, communications between systems engineers and suppliers are still carried out, in part, on paper – an error-prone and lengthy process.

Modern software solutions for the lifecycle engineering of a plant, such as Comos, are a decisive step in the direction of data consolidation. With Comos, all disciplines involved in plant engineering work together using a single database. Due to the object-oriented approach of the software, design features and device characteristics are recorded only once, and changes are automatically incorporated into the individual planning processes. The decisive advantage of this approach is that many processes that previously had to run sequentially can now be carried out in parallel. Also, planning reliability is increased because all disciplines always work with up-to-date plant data.

Direct access to device characteristics

The selection and procurement of necessary field devices and other components, in particular, can be significantly accelerated with Comos directly accessing the device specifications of individual manufacturers. For the selection of Siemens field devices, PIA Life Cycle Portal (PIA LCP) is now available. The tool supports both designers and operators of process plants throughout the complete lifecycle of the plant – from planning, selecting, and ordering to commissioning and maintenance.

The interface between PIA LCP and Comos allows seamless integration of all relevant device characteristics – from the engineering of a plant to modification and modernization. Technical data for device selection can be used without any manual interaction. Design characteristics already available in Comos are automatically transferred to the portal and can then be evaluated, clarified, and supplemented. The customer receives a preselection of suitable devices and can easily compare the technical characteristics.

Consistent data

This process makes reliable device characteristics automatically available, which can then be directly adopted into automation planning and incorporated immediately into the procurement process. Due to the availability of the original design characteristics in basic engineering, any necessary device exchanges are simplified. Continual optimizations are also possible, thanks to the use of new device versions. Having a consistent database from the outset also makes operation, servicing, and maintenance of the plant easier and simplifies documentation throughout the plant’s complete lifecycle.

PIA LCP currently includes the main products from pressure, temperature, filling level, and flow measurement technology and also positioners. The complete product portfolio will be available at the end of the year.

PIA LCP is, however, not limited to use with Comos. The portal makes complete product-specific documentation available to systems engineers in accordance with MLFB specifications. A complete data sheet can be downloaded as a pdf or XML file immediately after the configuration of a product.

A new standard in sight

In the future, data exchange should be possible with all planning tools. A new industry standard for the exchange of operation and device characteristics – eCI@ss 9.0 Advanced is expected to replace the previous standard, NE 100 3.2. A first functional model will be presented at the NAMUR general meeting in November to demonstrate what the workflow could look like. Should this standard prevail, systems engineers and device manufacturers will be able to communicate in a standardized language in the future.

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Field devices today provide a wealth of diagnostic information that is an indispensable data source for assessing the state of a plant. However, the variety of devices and their different communication connections make the integration of process instrumentation in process automation and the ongoing maintenance of the device landscape a complex task.

Users in the process industry have for some time been demanding a uniform

Different worlds for device description previously made the integration of field devices difficult; now, however, FDI is set to become the new standard, reducing effort, cost, and complexity.
Advantages for both users and manufacturers

“We believe that field device integration is an important step toward reduced complexity and improved customer service. The main advantage for the manufacturer is that only one FDI Device Package will need to be created for a device in the future, and this package can then be used regardless of the user tool. With FDI we see an opportunity to bring together the advantages of EDDL and DTM in an advantageous way.”

standard for easier integration of field devices on the control level. For example, NAMUR formulated the corresponding requirements as a supplement to NE 105 back in 2011.

The best of both worlds

The current basic techniques for maintenance and diagnostic tools are EDDL (Electronic Device Description Language) and FDT (Field Device Technology). Both methods have their strengths and weaknesses and are characterized by overlapping functionality. The new approach field device integration (FDI) brings together the advantages of EDDL and FDT, creating a scalable solution that supports field devices from configuration and calibration to commissioning to diagnostics during running operation, thus providing benefits over the entire lifecycle of a process plant.

The components of FDI

A central component of FDI is the FDI Device Package. In order to specify, standardize, and introduce FDI, FDI Cooperation LLC was founded. Organizations involved include the FDT Group, the Fieldbus Foundation, the HART Communication Foundation, Profinet International, and the OPC Foundation. The FDI Device Package includes all the data necessary for the integration of a field device and consists of the following subsets: the Device Definition (Def), which describes the data and the internal structure of the field device; Business Logic (BL), which ensures the consistency of the device; and User Interface Descriptions (UIDs) and User Interface Plug-ins (UIPs), which define the user interface of the device. The UIDs are based on the EDDL specification according to IEC 61804-3. The UIPs are optional and allow freely programmable user interfaces for the first time – to support complex entries graphically, for example. And finally, the package also describes the product documentation and protocol-specific files, such as GSD or DFF.

Prepared for a smooth migration

In addition to open interfaces, FDI Cooperation is also developing crucial components for what are known as FDI hosts. These include asset management systems as well as solutions for device management such as Simatic PDM. One aspect of this development effort is full backward compatibility with EDDL and FDT in order to enable a seamless transition to the new FDI world.

As for Simatic PDM, Siemens will certify its solution as an FDI host. The focus is on investment protection for the customer, of course. The large number of installed field devices will therefore continue to be supported. However, the simultaneous integration of FDI in Simatic PDM allows a seamless transition to the new technology with minimal effort.

Siemens will present a first prototype of Simatic PDM with integrated FDI functionality at the NAMUR Conference 2013. The prototype is able to import FDI packages and thus operate field devices. For individual Siemens field devices, initial FDI packages will also be shown; these will demonstrate UIDs and the possibility of new, freely programmable UIPs. The future of FDI in process control technology will therefore be much less complex and costly than is commonly apprehended.
Modern Sitrans field devices have numerous functions that cannot be exploited using standard integration into automation solutions. This gap will be closed by the Sitrans Library step by step.

Openness and the support of industry standards are core features of seamless automation and are thus the focus of process control right down to the devices in the field. But many Sitrans field devices have features that cannot be directly integrated into an automation solution in accordance with established industry standards. A typical example of this situation is the Sitrans transducer F M MAG 6000. It has an integrated dosing function via which a valve or a pump can be controlled directly.

**Direct on-site control**

The Sitrans Library makes device-specific function modules available for an ever-increasing number of field devices, thereby providing functions and data of the device and allowing for an easy integration into the automation solution. This also applies to the Sitrans F M MAG 6000 now. The advantage of this transducer is that, in order to dose, the pump and valve need no longer be controlled via a separate binary output in the control system. As a result, the customer saves space in the control cabinet and also has lower costs for cabling and engineering. All measuring point information is displayed on a faceplate and can be operated from there. This includes the transducer’s two totalizers.

**Cross-platform solution**

The library can be used in combination with a Simatic PCS 7 controller but also in the S7-300 and S7-400 controls, as well as in all Simatic panels with WinCC flexible. The look and feel are oriented toward the Advanced Process Library (APL) standard of PCS 7 and are uniform for all target systems. For operation in divided, hierarchical plants, such as those often found in the water management sector, centrally adjustable access control is supported on all levels. Hence, the Sitrans Library integrates seamlessly into the PCS 7 Industry Library.

**Cost-effective and secure**

In addition to the Sitrans F M MAG 6000 with Profbus DP, the current Sitrans Library V1.0 also includes the Sitrans LUT400. The next step will be to add the Sipart PS2 positioner. Other field devices from the Sitrans family will gradually follow. And so, at last, the entire functional scope of field devices will be usable, and a simpler, more secure means of achieving cost-effective automation solutions will be available.
With state-of-the-art functional safety techniques and methods, modern field devices such as the Sitrans FC430 flowmeter can achieve ratings up to SIL 3 while integrating safety functions and non-safety-related measurements in the same device.

A safety instrumented system (SIS) represents a process control loop consisting of a sensor/transmitter, a logic unit, and an actuator. A device’s Safety Integrity Level (SIL) is based on the rate of random failures, expected risk, and measures to avoid systematic failures. Depending upon the requirements, safety systems have different architectures (technical solutions) with integrated safety measures and diagnostic functions.

**Integrating safety**

The IEC 61508 safety standard requires a stringent development process with many safety-specific activities and a high level of documentation, verification, and validation. It also recommends techniques and measures to achieve a higher SIL. Today, it is standard practice in process instrumentation to use the same devices for safety functions (even emergency stop switches) and non-safety-related measurements. Therefore, devices must be able to perform safety shutdown functions and support fail-safe operation, safety tests, and self-monitoring.

One device that meets these criteria is the Sitrans FC430 flowmeter. When designing the device, the Siemens engineers strove to identify as many potential mechanical and electronic failures as possible in order to create a architecture and design that can handle all the various system failures. The Sitrans FC430, which complies with the IEC 61508 safety standard, can be used in safety circuits up to SIL 2 in a single-channel configuration and up to SIL 3 in a redundant configuration. No additional measures are required from the application side.

**Safety all around**

For safety-related applications, a dedicated safe current output is used to transmit the calculated flow as a 4–20 mA current. In the case of dangerous failures, the device is brought into a safe state with a safe current output of 3.5 mA. The modular design of the device enables high-precision flow measurement with a digital signal processor (DSP). The measured flow is distributed to a second processor, which generates the safe current output. An external watchdog unit supervises the microprocessor units and ensures the cyclic measurement and that the processors are operational. Finally, an advanced safety validation wizard enables users to easily validate the configuration of the flowmeter during commissioning, minimizing errors and making device operation more user-friendly.
Siprocess GA700

A new device generation

Reliable, accurate, and user-friendly – for more than 40 years, process gas analyzers from Siemens have been providing excellent performance to users around the globe. And now the new Series 7 is following in the footsteps of Oxymat and Co.

The main feature of the new series is its innovative platform concept. A base unit with a local user interface, communications interfaces, a power supply, basic electronics, and software allows the integration of various analysis modules. These modules consist of the actual analyzer and the sensor electronics, including evaluation software and the required interfaces. The base unit also offers space for an optional gas management module, which regulates the pressure of the gas to be measured and removes dust or condensation droplets, thus making laborious external sample preparation unnecessary in many cases.

All modules of the new series also feature a uniform operating concept. During operation, the modules give automatic notification of service intervals, residual lifetimes of wear parts, and calibration requirements and thus enable the implementation of preventive maintenance programs. The devices communicate over Industrial Ethernet as standard; additionally, Modbus, Profibus, and Foundation Fieldbus interfaces are available as options.

YOU CAN FIND THE COMPLETE ARTICLE AND AN INTERVIEW WITH THE SIPROCESS GA700 PROJECT MANAGER IN PROCESS NEWS ONLINE
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Focus on energy

Efficient and sustainable

Energy consumption and energy efficiency gain in awareness both in the broader public and in the industry. The efficient and sustainable use of resources such as power has become an ever more decisive competitive factor for the process industry as well. Issue 1/2014 of process news therefore focuses not only on tried-and-tested approaches, but also on new ideas regarding energy conservation, energy management, and energy storage.

Some articles deal with novel approaches to energy storage. For example, with power-to-gas plants, power from renewable energies can be converted into hydrogen or synthetic natural gas, which can then be stored in the natural gas network. This would be a possibility for the long-term storage of electricity from renewable energy sources. Siemens has already implemented the first projects with these technologies, in collaboration with partners, and we will present these projects here.

Siemens also supports its clients in the process industry with energy audits, to analyze energy consumption and reveal the potential for more efficient use of energy. We will be showing you how companies from different industries have been able to reduce their energy consumption with energy-efficient products and systems from Siemens.
With COMOS, Siemens is the only supplier worldwide to offer the process industry an integrated software solution that covers and optimizes the entire lifecycle of a plant – from planning to operation and modernization.

Thanks to the interchange between COMOS and our pioneering process control system SIMATIC PCS 7, data from parallel processes and workflows can be brought together seamlessly – across all disciplines.

Engineering data from COMOS is fed into SIMATIC PCS 7 at the touch of a button. This integrated engineering reduces the number of interfaces throughout the entire lifecycle of a plant. By the same token, changes in operating parameters trigger an immediate update of the relevant data record in COMOS. As a result, all data and documents are available at all times, and always match the actual plant status. Integrated engineering thus opens up entirely new perspectives for planning, operation, service, and maintenance.