

# **SIEMENS**

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– Check against delivery –

## **Product and production are converging**

Worldwide, we note that the rising standard of living, more stringent quality requirements, and increasing individualization are having an influence on our production systems. Our customers in automotive and mechanical engineering face the challenge of having to launch a whole range of diverse products within the shortest period of time and to a prime standard of quality. Globally interlinked material flows require flexible manufacturing plants, synchronization of merchandise management systems with production systems, and production traceability.

At the same time, cost pressure is prompting industrial companies to increase productivity throughout the entire production life cycle, with success being increasingly governed by time and cost to market. In spite of the growing complexity involved in linking mechanical and electronic items with software, there is a continuing need to further reduce development time, in particular the testing and commissioning phase of production plants.

In view of these challenges for producers, automation providers which boast a complete portfolio spanning hardware and software are very much sought after. Besides integrated IT systems for asset management, HMI (Human Machine Interface) and MES (Manufacturing Execution Systems), we at Siemens focus primarily on developments in digital engineering to enable our customers to realize productivity gains. When all is said and done, it is not just the production process itself, but also the design, dimensioning, construction, commissioning and conversion of production plants that are coming under increasing time and cost pressure. In the future, new production systems will need to take into account any product variant demanded by the consumer as early as the planning phase. Product and production are increasingly converging.

We are meeting the needs of this new trend by extending our industrial software portfolio to include product lifecycle management software. In 2006 we acquired UGS Corporation, the global leader in the business. The portfolio of what is now Siemens PLM software covers the full range of tools used in computer-aided design, digital product management and software for simulating manufacturing processes.

## **A case study of productivity gains**

Three cases in point illustrate what this is about and which benefits companies can gain from using PLM systems.

BASF applied our Tecnomatix Plant Design and Optimization solution to simulate both existing and new plants. These simulations helped them gain an early idea of such potential phenomena as bottlenecks in the process and consequently how to remedy them. Tecnomatix was used to model, calculate and optimize two new mixing plants. The result: significantly reduced operating costs and lower cost of capital.

PLM products were also used by Shenyang Liming to create a fully digital gas turbine model which is being used from the design through to the manufacturing process. To Shenyang Liming, this meant a significant improvement in the interaction and information flow between development and production. Design modification time was reduced by 48 per cent and process planning time by 51 per cent.

Mazda used our NX and Teamcenter products to create a fully digital model of its vehicles, helping them to respond much faster to changes and to develop alternatives. Moreover, the information flow within the company and with its suppliers was improved. The digital development environment helped Mazda to bring down the development time for new vehicles from eighteen to fourteen months.

## **Totally Integrated Automation – The link between product and production**

With PLM providing a consistent and integrated image of all product and production data, it also serves as the basis for a fully digital factory. Here, the entire production process is first virtually tested and optimized, and the results then directly used to create the manufacturing programs and parameters. This was why we took over innotec GmbH in 2008, now renamed Comos Industry Solutions GmbH. On the one hand, this acquisition helped us to further broaden our leading global position in the industrial software market; on the other it made us the first industry supplier capable of providing all manufacturing and process industries with consistent solutions for integration of their complete manufacturing flow and the entire production life cycle.

## **Comos – A common platform for production engineering**

The Comos product range is an ideal technological addition to our portfolio. Comos provides an integrated software solution for the process industry, covering the full range from production plant planning to operation and modernization. After having developed our Simatic Automation Designer for the manufacturing industry it is now the turn of our customers in the process industry who, by applying fine-tuned Siemens technology, will benefit from significantly reducing their time-to-market.

### **Simatic Automation Designer**

The Comos acquisition has now created the possibility to combine the existing functionality of Simatic Automation Designer with the successful Comos software platform. We are set to combine the best of both previously separate product lines – Simatic automation Designer and Comos. In the future, Simatic Automation Designer will be based, like Comos, on the principle of object orientation, thus ensuring consistent data across all departments. All the well-known unique selling propositions of the former Simatic Automation Designer, including Sequence Designer, WinCC creation and gateway to virtual commissioning, will be transferred to the Comos platform. Integrated functional engineering of hardware and software will result in better planning quality. This will also mean that the basis for the Digital Factory in connection with Siemens PLM software, such as Teamcenter and Tecnomatix, will remain intact and will now be available not only to manufacturing but also to the process industry. With this move, we are adding important plant life cycle management tools to our Totally Integrated Automation portfolio.

## **The Industry Automation Portfolio**

With Siemens PLM Software and Comos Industry Solutions, Siemens is now the only company to cover the entire creation production process, including all engineering elements and integrated software solutions. Our hardware and software portfolio covers our customers' complete value adding chain, from the initial product idea to delivery of the finished product. We are working on reducing the number of interfaces based on open standards; and we are eliminating the stand-alone solutions commonly used to date, thereby accelerating the time-to-market. Improvements of 50 per cent or more are no exception.

## **Industry Automation's product portfolio**

Having discussed the convergence of product and production, I would now like to focus on the part of our widespread portfolio which is most closely linked to automation, namely production. Here I will be looking at Totally Integrated Automation which, besides the drives presented by Herr Helmrich, ranges from sensors to industrial communication and from process control systems to MES (Manufacturing Execution Systems.)

## **Totally Integrated Automation**

TIA, launched in 1996 and based on the six system features of engineering, diagnosis, communication, safety, security and robustness, has been undergoing continuous development in every one of its components ranging from sensorics to MES. It is only through continuous innovation that we can meet our customers' requirements, thus supporting them in further increasing their productivity. Our continuously maintained and updated state-of-the-art Simatic controls provide an essential pillar of our value proposition.

## **Totally Integrated Automation – Innovations in control systems**

Simatic S7-1200 is the latest member of our mini-controller family, and will be unveiled at the Hanover Fair. Its main feature is perfect interaction with both the new Simatic HMI Basic Panels (Human Machine Interface) and the engineering system. ... The programming, project planning and commissioning software is a totally integrated system, which sets whole new standards in engineering. Intuitive operation saves users valuable time, ensuring great efficiency. It is a genuine productivity engine.

The Simatic S7-1200 Micro PLC is a new modular micro-controller for compact applications in the lower performance range. In developing this controller, special attention was paid to its seamless integration and perfect interaction between controller, HMI and software.

The controller's scaleable and flexible design makes for perfect, precisely tailored automation solutions. The central module can be easily extended by I/O modules and communication modules. A new feature are Signal Boards which are plugged onto the face of the CPU, providing either two DI/DO interfaces or one analog output. They make for a particularly compact design in all applications that need to connect only a small number of signals.

Networking and communications between engineering, controllers and HMI are simple and uncomplicated. Simatic S7-1200 has an integrated Profinet interface for HMI, programming and CPU-to-CPU communications. The new Simatic HMI Basic Panels can also use the same interface, ideally complementing the Simatic S7-1200 controller and providing low-cost visualization in class IP65.

The perfectly matching range of HMI Basic Panels boasts graphic displays from four to 15 inches, featuring touch functionality and tactile function keys and the same messaging system, formulation management, and curve functionality across all display sizes, plus an integrated Profinet interface.

Integration is also central to the Simatic S7-1200 software. The new Simatic Step 7 Basic engineering system enables fully integrated engineering for both Simatic controllers and Simatic HMI Basic Panels. Task-oriented and intuitive editors in Simatic Step 7 Basic V10.5 provide a unique degree of user-friendliness and high engineering efficiency.

## **Totally Integrated Automation – Innovations in diagnosis**

Plant availability is a major lever to increasing productivity. The facility for proper maintenance schedule planning plays a key role here because the right maintenance routines need to be executed at precisely the right time. The optional Simatic Maintenance Station combines the Simatic WinCC scada system for diagnosis and maintenance of machines and plants in a central system supporting preventive, condition-based and reactive maintenance.

At the Hanover Fair, we will be launching the new 2009 version featuring innovative diagnostic mechanisms based on Step 7, adding distinctly extended functions for system-integrated diagnosis and near-plant asset management. The main benefit for the plant operator lies in a reduction, or even elimination, of machine and production downtimes, thanks to a uniform, clearly understandable display which helps him pick up all information relevant to maintenance. An optimized information flow helps to significantly cut maintenance costs since maintenance requirements can be directly communicated to any optional target systems. All events are message-based, i.e. they can be archived and tracked, thus creating a comprehensive database which can be analyzed by either WinCC means or external tools.

The main new features will include functions for easier project programming via a central dialog, as well as planning and clear monitoring of maintenance routines and jobs using convenient filter settings. Web access now also allows for supporting remote maintenance and remote access to the Simatic Maintenance Station. The scope of application is further enhanced by the touch-operated Panel PC which also HMI devices diagnosis at field level. Besides diagnosable multi-computing racks, wide-screen monitor resolutions are now also supported. The hierarchical inclusion of asset objects into the plant hierarchy makes it possible to exactly locate existing assets, thereby reducing response times in an event that requires intervention. Another new feature is the interface for link-up to condition monitoring systems for observation of wear-prone components in industrial plants.

## **Totally Integrated Automation – Innovations in HMI**

There are also new operating and monitoring features due to be launched at the Hanover Fair. With its brilliant 6-inch TFT touch display with 64 k colours and a large number of interfaces, ranging from USB to 10/100Mbit/s Ethernet, RS485 and Profibus DP, the Simatic Multi-Panel 177 is particularly suitable for demanding tasks. The Multi-Panel 177 not only handles such tasks as operating and monitoring machines and plants but also performs additional automation tasks such as control assignments. For this purpose, the Simatic WinAC MP 2008 soft plc is integrated into the Multi-Panel and configured in Step 7 like all the other Simatic controllers. Configuration of the new Multi Panel is performed by means of the Simatic WinCC flexible 2008 engineering software.

The maintenance-free new Simatic Multi Panel 177 6" Touch works without hard disk and fan, which makes it particularly suitable for machine-oriented use. An integrated data remanence receives process data even if the voltage supply is interrupted. The combination of Multi Panel and software plc is available as a pre-configured complete package ready for switch-on and is also suitable for migrating a large number of tasks from the discontinued Simatic C7 range of complete devices.

## **Totally Integrated Automation – Innovations in process control systems**

With PCS 7 we have a process control system on a standardized Simatic base for which demand is constantly rising, especially in the chemical, pharmaceutical and food & beverage industries, and which will continue to keep us firmly on a growth course. The number of projects implemented on the basis of PCS 7 has risen to over 7,000 worldwide. At the Hanover Fair, we will be launching the new release 7.1 featuring a large number of new functions. This new release is designed to help further reduce the time required for engineering, installation and commissioning, and to cut operating and maintenance costs. Upgrades featured in the new Simatic PCS 7 V 7.1 release cover almost all functional areas. Let me now present some case studies: The "Advanced Process Library" provides new operating modes for engineering and makes it easier for the operator to communicate with his plant. Directly from the operator station, advance simulation is now possible prior to commissioning. Both testing and programming times are thus reduced during commissioning and maintenance. Aiming at greater efficiency and productivity, the

user interface of Simatic PCS 7 V7.1 has also been re-engineered. An optimized colour scheme and improved alarm functions make critical conditions visible to the operator much faster. New ergonomic symbols and task-oriented face plates in the Advanced Process Library V7.1 provide the user with a consistent user interface and a uniform representation of condition data. These faceplates can be easily adjusted to suit the plant's operating philosophy. Moreover, Simatic PCS 7 release 7.1 makes for easier query and analysis of both legacy and current process data.

### **Totally Integrated Automation – Innovations in energy efficiency**

With a view to meeting the growing needs of industrial companies to optimise energy efficiency as well as increasing productivity, we have added energy management functions to our automation systems.

Our innovative power management add-ons, 'Simatic WinCC powerrate' and 'Simatic PCS7 powerrate', create the necessary transparency and clarity in electrical and non-electrical energy flows that allow our customers to allocate costs to the original consumer. Energy optimization measures of this kind help cut power and operating costs by as much as 20 per cent. Penalties payable to the utilities can be avoided by continuously monitoring the power limit.

An integrated power management system based on such standards as Simatic, WinCC or PCS 7 provides significant cost advantages over stand-alone solutions supplied elsewhere.

New automation functions can be implemented, for instance to cut stand-by time or avoid peak loads, by interlinking smart sensors and actuators in power distribution with integrated measuring and monitoring functions, such as Sentron PAC multi-function instruments, Sentron power switches, Slimocode pro motor management systems, Sirius soft starters, and Sinamics frequency converters. The new Sentron PAC4200 multi-function measuring instrument also monitors the mains quality, helping to avoid unnecessary plant failure.

Thus, close integration of both power and automation systems open up new ways to leverage new growth potential in terms of energy efficiency and productivity.