WORLDWIDE

PREPARED FOR INDUSTRIE 4.0, BIG DATA AND THE LIKE

Electrical and automation systems enabling for full digitalization.


SMS group

LEADING AUTOMATION EXPERTISE

The proven solutions SMS group offers in the field of electrical and automation systems are summarized under the term X-Pact® (process, automation, control, technology).

- **The X-Pact® packages** offer tailor-made solutions for complete automation and digitalization.
- **X-Pact® Process Guidance** provides an intelligent connection and systematic networking of knowledge and data thus setting a new standard in plant automation.
- **Plug & Work tests** permit the customized plant automation system to be tested prior to the plant erection and commissioning at the customer's site.

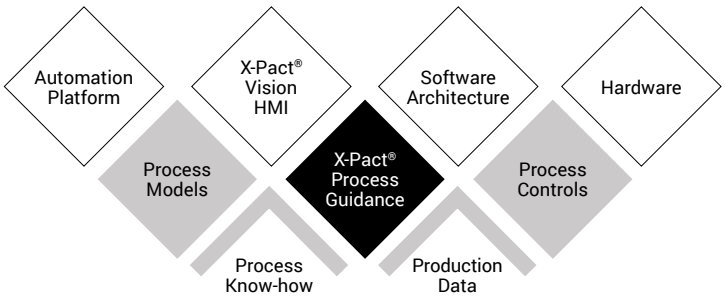
With X-Pact® Leading Automation, SMS group offers the complete systems expertise along the entire metallurgical process chain. Their highly flexible modular design makes the X-Pact® packages a key element in the successful implementation of plants. X-Pact® makes sure that all of the customers' plant components operate in perfect harmony – from energy supply and distribution to drive technology, further to instrumentation and automation and finally to production planning. Operating closely with its customers, SMS group develops tailor-made solutions and future-oriented technologies in line with each customer's wishes and is hence in a position to implement complete automation and digitalization environments.

SMS group combines classical mechanical engineering and innovative digital services, thus creating added value for its customers along the entire value-added chain. Essential factors here are embedded systems, digital service platforms, real-time networking of plant data, big data analytics, cloud computing for self-optimizing and autonomous process control.

A learning steelworks features an intelligent and largely autonomous production process. But how can a plant learn? This is very simple to answer. It uses data and derived information as a basis for decisions relevant for process control and operations.

Using X-Pact® Process Guidance, SMS group sets a new standard in plant automation in that it provides intelligent connectivity and systematic networking of knowledge and data. The real-time information hub that supports all usual Industrie-4.0 communications standards for digital products permits new sensors to be connected in almost no time. After their validation, process data can be exchanged between different systems, as for instance the energy management system or the plant condition monitoring system. To ensure safe communication, sophisticated authentication takes place in addition to common encryption methods. A uniform style

New innovative standard in X-Pact® Leading Automation



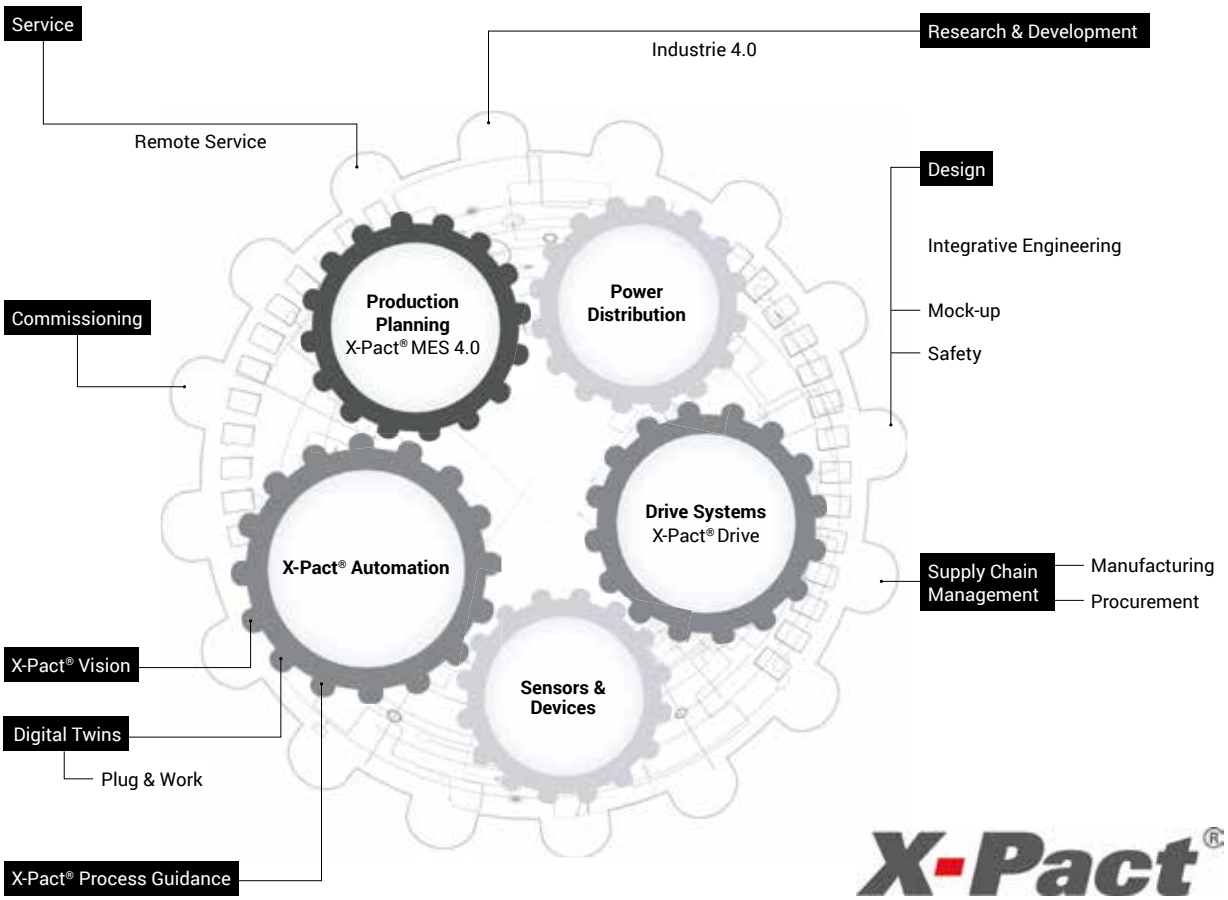
guide of X-Pact® Process Guidance gives all plants from SMS group the same graphical appearance.

TRENDSETTING TECHNOLOGIES

X-Pact® Process Guidance moreover features a wide variety of virtualization functions. Virtualization promotes the creation of redundant capacity to increase plant availability and makes independent of the system hardware.

As the X-Pact® Automation features a consistently modular design, it is easy to integrate classical modules like reporting, tracking, material management and process models. New benchmarks are also set by an innovative software architecture thanks to the run-time flexible, service-based networking of automation functions.

Along with the growing digitalization of production facilities, SMS group has developed systems capable of ensuring comprehensive quality control and achieving optimization of production processes in terms of throughput and plant utilization. Incorporated in these systems are cutting-edge, intelligent planning tools that are increasingly based on artificial intelligence. In the learning plant, the currently applied, traditional medium- to long-term production planning process is replaced by a ▸



PERFECTLY HARMONIZED

X-Pact® provides tailored, digital automation solutions for the entire metallurgical process chain. The system ensures the systematical networking of knowledge and data and is the central basis of the vision of the “learning steelworks”.

AN EYE ON PRODUCTION

Real-time production planning is the ultimate objective of plant operators. Virtualization and artificial intelligence help take a big step in that direction already now.

self-optimizing production planning system in real-time like X-Pact® MES 4.0. SMS group's metallurgical know-how allows for advanced production planning and control, and substantially contributes to its customers' success in business due to the optimization strategies applied (please refer to the article on artificial intelligence in X-Pact® MES 4.0 systems starting on page 28).

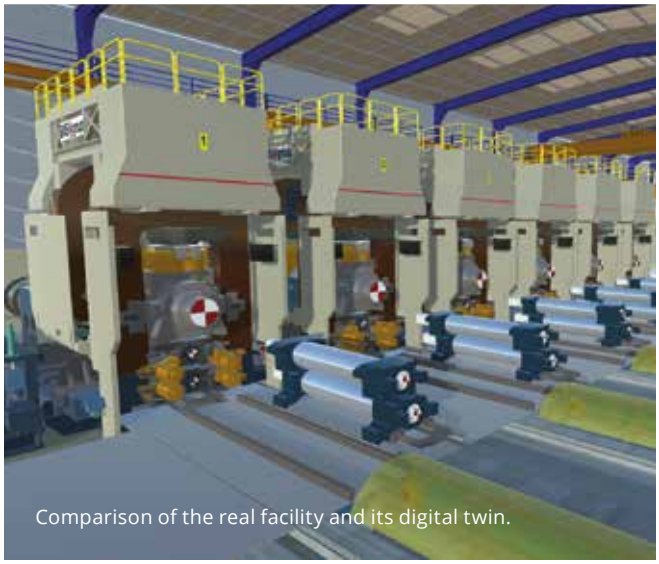
The key elements include the tool X-Pact® Business Intelligence with interactive analysis options and an extensive, sophisticated web reporting system offering a clearly structured and comprehensive visualization of the production processes on the dashboard. The information is presented in the required level of detail according to the operator's input.

DIGITAL TWINS

Digital commissioning of the customer's automation systems takes place as early as during the Plug & Work test. The Plug & Work concept developed by SMS group permits valuable time to be saved already in the forefront of the plant erection and commissioning. A new automation system is completely installed, tested and pre-optimized in the test fields of SMS group a long time before erection work on site is going to start. This is possible thanks to a realistic 3D

real-time plant simulation reproducing a digital twin that features the same functions and technology as the plant for the specific customer. Within the scope of the Pug & Work test, this simulation is connected to the automation system of the plant to be tested and serves as substitute of the real plant. On that occasion, SMS group employees can train the future operating staff at the original control desks. In the virtual production process, the customer's staff has the opportunity to familiarize with and master the functions of the plant and its handling in realistic operational situations. Using Plug & Work can cut the time needed for commissioning by up to 30 percent compared to the ▸

Real facility at Big River Steel, Osceola, U.S.A.



Comparison of the real facility and its digital twin.

REALISTIC 3D PLANT SIMULATION IN REAL TIME

→ To save valuable time in the forefront of the plant erection and commissioning, new automation systems are tested by SMS group in advance. For this purpose, a digital twin is created of the customized plant. This twin is connected to the automation system by means of a realistic 3D plant simulation in real time, then tested and pre-optimized.

→ This so-called Plug & Work test may also be used to train the operating staff at the original control desks. This way, the commissioning time can be reduced by up to 30 percent.

SMS group test center in Hilchenbach.

EXPERIENCING INNOVATIONS

Many customer delegations visit the Mönchengladbach test center to experience live the virtual production by various plant types during digital commissioning and to gain an overview of the current innovative concepts offered by SMS group for the implementation of a learning steelworks.

The Mönchengladbach test center is also the creative hub of the Business Unit Electrics/ Automation. Like in an innovation lab, this is the place where new, innovative future trends in plant automation are developed and implemented.

conventional proceeding. SMS group's Plug & Work is a concept that has been tried and tested over a long term and is continuously improved to meet the requirements of the new industrial age.

At numerous locations worldwide, SMS group operates Plug & Work test centers and training facilities. At these specifically equipped test fields, original control desks, switch cabinets and automation systems are installed and configured according to the individual requirements of the customer. Then, all hardware components have to pass a function test to discover and remedy possible defects already in advance. The benefit for the customer is that he can rely on receiving faultless and thoroughly tested software. ◆

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