

Leading as the Digital Enterprise

Electronics Works Amberg Digitalization Practices

siemens.com/digital-enterprise-suite

Living the digital enterprise

Digitalization is changing the world as we know it. Consumers benefit from new ways of shopping, more variety, easy comparison, fast delivery, and attractive pricing. To meet these requirements, manufacturing companies need to digitalize their entire value chain – including suppliers. They need to become digital enterprises. This is exactly what we did at the Electronics Works Amberg (EWA): Here we produce controllers, HMI, periphery, and other products from the SIMATIC portfolio – with a clear focus on customer satisfaction, product quality, transparency, and efficiency.

We use Siemens' Digital Enterprise Suite to streamline and digitalize our entire business process. That way we can manufacture around 1,000 product variants and one product per second with 99.9989% built in quality. With continuous learning, highly dedicated and qualified employees, and ongoing lean management and automation, we manage to stay competitive in a dynamic business environment.



Reducing time-to-market

- shorter innovation cycles
- more complex products
- bigger but smarter data volumes



Quality

Enhancing

customization

diversified market

highest productivity

availability

flexibility

- closed-loop quality processes
- traceable products
- meeting legal requirements
- highest quality standards



Increasing efficiency

- optimal capacity utilization
- efficient resource utilization



Security

- digitalization leads to increasing vulnerability to cyber attacks
- increased need for appropriate security measures



EWA follows the holistic approach for the entire value chain



Suppliers and logistics

At Electronics Works Amberg, we use a holistic approach that transforms a traditional value chain into an integrated product and production lifecycle – from product design to production planning, production engineering, production execution, and service. Only a fully digitalized business model with a consistent digital thread has the power and flexibility to speed up processes and optimize production operations. This also requires a joint data storage and data management system. With Teamcenter, Siemens provides the industry's leading collaboration platform throughout all steps of the value chain – that means one data backbone.

Continuous optimization

MindSphere allows to analyze production assets and products as they perform and feed back the insights into the entire value chain for continuous optimization.





120

variations are built per day with a degree of automation of 75%

Collaboration Platform and Data Backbone

- Design management
- Document management
- Bill of Materials (BOM) management

Product Design, Simulation and Manufacturing

- Concept, 3D modeling and documentation
- Product simulation across multidisciplines
- Common product model from design to manufacturing applications



NX

Customer value

Quick response to product changes

High production flexibility

More product variants



~350

changeovers per day to handle 1,000 different products

~5,000

work plan changes per year (more than 20% due to product component discontinuation)



Production Simulation

- Plant design and optimization
- Assembly process simulation and verification

Logistic Simulation

- Macrologistic for factory and lines
- Micrologistic for stations

Tecnomatix

Tecnomatix

Customer value

- Accelerated commissioning
- Reduced risk and cost
- Managed complexity





SIMATIC produces SIMATIC

- Controllers
- Panels
- IPCs

Totally Integrated Automation Portal (TIA Portal)

TIA Portal as engineering framework
TIA Portal as gateway to automation in the Digital Enterprise

Totally Integrated Automation

Customer value

High production quality and reliability

High efficiency in engineering and production

High degree of automation to reduce labor cost

>75%

More than 75% of the value chain is automated

>1,000

More than 1,000 SIMATIC applications

20% MTBF increased by 20% (over 10 years)



5 to 10

Manufacturing engineering 5 to 10 times faster

40%

NCC reduced by 40%

> 99.5%

delivery reliability to assure 24h delivery time

± 20%

personal capacity flexibility to meet customer demands on time



Vertical Integration

- Design to production: CAD to CAM
- PLM to MES: NC programming

Teamcenter SIMATIC IT

Quality

- Real-time monitoring
- Traceability
- Augmented reality
- Interlocking

SIMATIC IT

Flexibility

- Interoperability of worker and machine
- CPS model: self-organized by RFID

TIA

Customer value

Accelerated manufacturing engineering process

Increased quality on shopfloor

High delivery reliability

Availability of Big and Smart Data

8





73%

temporary reduction of ventilation saves 73% of energy at weekends

Energy Management

- High energy efficiency
- Significant savings of water, CO², and power

SIMATIC Energy Suite Energy Analytics

Security in Production

- Secured production environment
- Protection Level 3 in selected areas
- Regular security training



Defense in Depth

Customer value

Jump from protection level 0 to $3^{1)}$ for selected production areas related to product requirements in one year

Green Production

Protection of assets and knowledge

¹⁾based on the definition of IEC 62443

International appeal and radiance



German Chancellor Angela Merkel (second from left) and Siemens CEO Joe Kaeser (third from left) visit Siemens' "Digital Factory" in Amberg.



Bavarian Governor Horst Seehofer (left) and Czech President Bohuslav Sobotka (middle) visit EWA.



Saarland Premier Annegret Kramp-Karrenbauer learns more about the future of manufacturing.

Electronics Works Amberg showcases Siemens' concept for a digital enterprise. The factory already employs production methods that will be the standard in many manufacturing facilities in a number of years. Products in the plant control their own assembly by directly communicating their specific requirements and their next production steps via a product code to the machines. The Electronics Works Amberg factory with a production area of 10,000 m² employs about 1,200 people. This also has proven to be highly appealing to politicians from all over the world who want to stay up to date regarding the current state of manufacturing technologies. On February 23, 2015, German Chancellor Angela Merkel visited Siemens' Factory in Amberg and was briefed on the current status of production automation as it moves toward Industrie 4.0. Other well-known visitors include Bavarian Governor Horst Seehofer and Saarland Premier Annegret Kramp-Karrenbauer. In general, there are more than 300 visitor groups with around 4,000 people per year. Customer visits have a share of more than 60%.



Siemens Electronics Works Chengdu

Siemens Electronics Works Chengdu is the Chinese equivalent of the Electronics Works Amberg.

The Siemens Electronics Works Chengdu (SEWC) in southwest China opened in February 2013. Many parts of the plant in the Chinese megacity of Chengdu replicate its Amberg counterpart, and SIMATIC controllers are also manufactured at SEWC. The software tools and production sequences are the same in Chengdu and Amberg. The Chengdu facility even looks like EWA and employs about 350 people.

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