



SIEMENS



Reference



Production Network 4.0

Modern network infrastructure for traditional company in Baden-Württemberg

With a modern infrastructure for the production network and the remote maintenance of machines and plants, the Simon corporate group of companies is preparing for the future at its headquarters in Aichhalden, Germany. The secure and reliable network not only creates the basis for further networking within the various company areas at the site, but also puts the further growth of the company on a solid footing.

The success story of the Simon Group began exactly 100 years ago, when Karl Simon finished components for the Black Forest clock industry and founded the company Simon. Today, three companies belong to the Simon Group at its headquarters in Aichhalden – the Karl Simon GmbH & Co. KG with four business units, the Betek GmbH & Co. KG and the Sitek GmbH & Co. KG. More than 750 employees produce a wide range of products and provide services featuring the highest level of quality: Tools, furniture fittings, carbide tools, spikes, sintered components, injection molded plastic components as well as the finishing of parts in its own electroplating department.

“This variety of companies and products is one of our strengths,” explains Tobias Hilgert, managing director of technology at the Simon Group. “At the same time, this results in a number of challenges, especially when it comes to plant engineering.” The infrastructure for the communication in the area of the production is provided by the Group as a central service to all affiliated companies: “And it’s important that our solution is flexible, but nevertheless uniform and above all future-proof.”



At the various Simon companies in Aichhalden, more than 750 employees produce a wide range of products and provide services, including carbide tools and spikes.

For this reason, Simon decided about two years ago to fundamentally put the systems in the production network and remote maintenance areas to the test. David Huber, plant engineering team leader at Simon, explains: "We had two areas in which we were looking for a more modern solution. On the one hand, we wanted to create a standardized, secure way for remote maintenance, and on the other, we wanted to improve the performance and availability of our entire production network." Especially in terms of maintenance and expansion, the growing network technology structures required a great effort, continues David Huber: "In view of the developments in the course of the increasing networking and digitalization of plants, we encountered technology and personnel limitations with the existing infrastructure. That's why it was essential for us to adapt the structure of our production network to these requirements."

Special attention was paid to separate the production network for all plants at the site from the individual plant networks – in order to enhance network maintenance as well as increase network security, explains Sven Ostertag, who is responsible for the modernization of the network technology in David Huber's team: "We wanted a clear structure in which the plant components communicate within their cell, and only relevant data are transferred to the production network. This not only facilitates the maintenance and upkeep, but also makes our network more secure, since possible malfunctions are limited to one cell."

Detailed preparatory work and precise specification of the requirements

The Simon Group already utilizes Siemens products in many areas: "We wanted to employ standard solutions as much as possible to make the maintenance of the solution easier," says David Huber. "Solutions from Siemens for industrial PCs, HMI systems and controllers have been established at Simon for many years – so it was only logical to also turn to Siemens when we looked for a new network solution."

Initial talks took place at an information event held by Siemens in Stuttgart, and Simon was immediately impressed by Siemens' expertise and support, according to Sven Ostertag: "Industrial networks are an all-encompassing topic. As both a user and operator, we've to bring in a lot of our own know-how to the planning and implementation for the solution to precisely match our requirements. We were really supported well by Siemens – through initial training classes and then throughout the detailed planning, the design and the first commissioning. This allowed us to deepen and expand our knowledge of topics such as security – and we're now able to administer the network by ourselves."

Together with the network experts from Siemens, David Huber and Sven Ostertag discussed the framework conditions, took stock of the existing network, and chose the appropriate configuration and corresponding components. While doing so, the IT department at Simon was always on board. "In such an extensive project, it's imperative for everyone involved to act in concert – IT, plant engineering, and Siemens as supplier of the industrial network technology." In particular, the good preparatory work and support provided by the Siemens Professional Services team greatly facilitated the implementation, continues David Huber: "The commissioning ran flawlessly and the system works as intended." Thanks to the good structuring, Simon can now integrate new plants and participants on its own – as was the plan. Sven Ostertag: "From the start, we made sure that the components were largely standardized and that a good documentation was compiled – and that pays off now. For instance, we've defined five types of switches, which we essentially only need to select and duplicate for a new plant. This also allows us to easily pass on knowledge internally."



Collaboration for an optimal solution: Project team with David Huber, Sven Ostertag and Reiner Windholz (from left to right).



Heart of the new production network: Two of the altogether 32 SCALANCE XR524 switches, which enable the communication over a redundant Industrial Ethernet ring at up to 1 Gigabit.

Powerful, secured and transparent communication

The new production network at Simon is based on an Industrial Ethernet ring, to which several rings with 32 SCALANCE XR524 switches are redundantly connected. For the management and diagnosis, Simon utilizes the SINEMA Server software. For the connection of the subordinate plants, each possessing its own plant network, Simon uses the SCALANCE S615 Industrial Security appliance. It enables a secured access via VPN to the respective plant and at the same time shields the cell from the production network. "In my view, this cell protection concept is indispensable in the industrial environment," states Sven Ostertag. "In a networked production environment, this is the only way to ensure that malfunctions – whether due to failures, errors in the hardware or software, or unintentional or intentional manipulations – are limited to the respective cell.



Secure gateway to the plant networks: One of the SCALANCE S615 Industrial Security appliances at Simon.

The technical possibilities provided by SCALANCE S615 allow us to virtually eliminate any vulnerabilities in the communication. In my opinion, this product is among the best on the market for this application." With SINEMA Remote Connect as management platform for the secured remote access, plant engineering employees are also always fully aware of all VPN sessions. "This detailed information is not only important for the system security, but also shows us whether the system is accepted by the machine and plant builders," says David Huber. And the acceptance is good: "Especially when commissioning a new plant, the direct connection between personnel on-site and machine or plant builders is actively used. But even during operation, the production staff can request support via remote access at any time. As a result, problems can be resolved more quickly and efficiently than in the past."



With SINEMA Remote Connect, the secured remote access to the plant by VPN can be managed and monitored.

Solid foundation for future developments

The new production network has now been in place for almost a year. The project managers at Simon are very pleased with the results: Thanks to the ring structures of the network and the segmentation of the entire solution into individual plant networks, the entire network is much more reliable than before. For David Huber, especially the robustness and reliability of the devices are important arguments: "In many production areas, for example in the sintering plants, we're dealing with harsh environmental conditions. Thanks to the extended temperature resistance of the SCALANCE components, we've no problems with that." Possible faults and errors can be quickly identified in detail and be resolved with the SINEMA Server management and diagnosis software.



SINEMA Server supports the plant engineering personnel in the network management, and greatly facilitates the diagnosis and elimination of malfunctions.



Tobias Hilgert, managing director of technology, Simon Group: "For us, the digitalization and automation of our processes are important instruments for the continuation of our success."

Security information

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept. For additional information on industrial security measures that may be implemented, please visit <https://www.siemens.com/industrialsecurity>

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For Sven Ostertag, the simple maintenance of the new network also represents an important plus point: "If a switch or router needs to be replaced, the maintenance employee can do this in just a few simple steps. The appropriate configuration is simply transferred from the old device by means of the C-Plug. This greatly reduces our workload," says Sven Ostertag. Overall, too, the central administration with SINEMA Server considerably simplifies the work in plant engineering, and thus creates space for new projects.

Because with the commissioning of the new production network, the job at Simon is far from complete. At present, not only are existing plants gradually integrated into the production network as well as new ones connected – the team headed by David Huber also has its sights on the next task: "We plan to connect the existing different systems for machine data as well as production data acquisition and for manufacturing execution system information with a common database. We're already talking with Siemens about this. Here, again, a stable and powerful, but also secure production network is the prerequisite – and we now have created a solid foundation for that."

Managing director Tobias Hilgert also considers Simon well equipped with the new network solution: "For us as a company that is facing tough international competition, the digitalization and automation of our processes are important instruments for the continuation of our success. In Aichhalden, we're currently building a new production hall, where we want to further increase the degree of automation, which includes innovative approaches, such as data mining, for further improving the efficiency and quality of our processes. On the one hand, we need data from the production, on the other hand, the appropriate infrastructure and right tools to capture and evaluate these data. And of course, the knowledge of our employees. But we also need capable partners that can broadly support us in the standardization and networking of our processes. With Siemens, we've found such a partner, and I expect that the other projects, too, will further strengthen our competitive position."