




Technical
article

Large number of ports, small design

19" rack-mount switches for any industrial
requirement

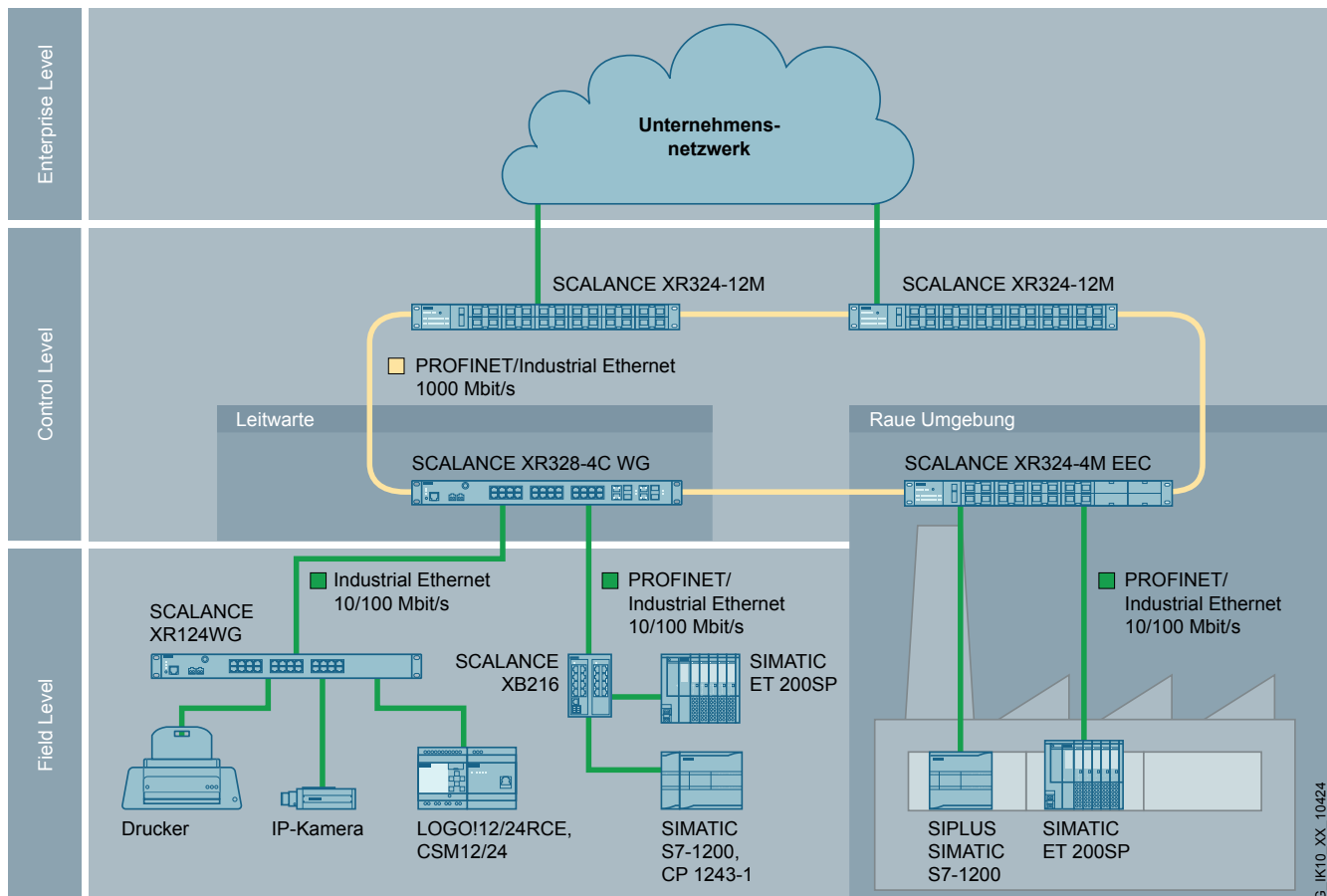
In this age of digitalization and IIoT, the number of devices that need to be connected to data networks is getting larger and larger. This trend does not stop when it comes to industrial applications. It is expected that by the year 2020, about 15 billion communication-capable devices will be connected via industrial data networks. Thus, more and more devices become network-capable and must be connected to Ethernet-based data networks for data analysis or central configuration purposes. To that end, network components/switches are required that can provide a large number of RJ45 ports in a very small installation space.

In all industrial areas, digitalization is more strongly shaping current automation technology than ever before. No field and no application can ignore this trend. As more and more data is collected for the optimization of plants, the result is greater cost savings.

Requirements from Digitalization

To receive data from terminal devices, it must first be collected. Here, more and more terminal devices, sensors or cameras are becoming networkable. Thus, data from the various process and production sequences can be very easily collected and processed. In order to connect these sensors and actuators to the network, the network also must provide sufficient connection points, to which these terminal devices can be connected. Especially for industrial applications, connection points come with different characteristics. These connection points, which are also refer-

red to as network components or switches, are available in different port configurations with various mounting technologies. In part, small, compact network components are employed, which only permit the connection of a few sensors/actuators and can be mounted to top-hat DIN rails inside small, on-site control cabinets close to the machine and system. These switches are usually equipped with 100 or 1000 Mbit/s connection points, which are executed as RJ45 interface for control cabinet mounting or with M12 interfaces for cabinet-free installation. Devices possessing fiber-optic interfaces usually enable the connection to higher-level network structures or far away participants.



With the SCALANCE XR-300 rack switches, consolidation points can be realized in all areas of an industrial application – directly at the process with SCALANCE XR-300 or in a control room with SCALANCE XR-300WG.

Mounting technology specifies deployment location

In higher-level network structures, a larger number of ports is often required. There, devices with up to 24 or 28 ports are used. Devices with such a high port count then often constitute nodes in an industrial automation system.

Nodes summarize data from subordinate structures – e.g., the field level – and vertically forward it to other hierarchically distributed systems – such as the MES level and industrial data centers. At these nodes, the requirements on the mounting technology often change, since additional components – such as industrial PCs for the preprocessing of the collected data – need to be accommodated.

Nodes in production automation are usually implemented in the form of small control cabinets, which must accommodate devices with 19" mounting technology. This mounting technology describes device dimensions according to height units and overall width. This standard, predominant in office IT, is also popular at industrial consolidation points.

19" rack-mount switches for any industrial requirement

The portfolio of industrial-grade SCALANCE X switches includes many network components that are designed for the mounting to a top-hat DIN rail inside a control cabinet. In parallel to this spectrum, Industrial Ethernet switches with 19" mounting technology are available. These industrial-grade managed switches differ from office IT ones by featuring an extended temperature range, rugged RJ45 interfaces with retaining collars, and increased EMC resistance. The SCALANCE XR-500 product line offers 19" switches with layer 3 functionality and interfaces with data rates up to 10 Gbit/s. The SCALANCE XR-300 product line makes available 19" switches with layer 2 functionality and great interface flexibility (RJ45, M12, SC, ST/BFOC, LC).

Newly added to the SCALANCE XR-300 product line are the XR-300WG switches. The suffix WG in the name stands for workgroup switch. It describes 19" switches optimized for industry-oriented applications and control rooms, i.e., installation locations with less demanding environmental conditions. The switches likewise feature 24 to 28 ports, but possess a limited temperature range and have no retaining collars on the RJ45 ports and no removable data storage



Large number of ports in a small space – the new SCALANCE XR328-4C WG enables the space-saving connection of up to 28 terminal devices in a very small installation space in a 19" rack.

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 only form one element of such a concept. For more information about industrial security, please visit <http://www.siemens.com/industrialsecurity>

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C-plug. The modularity of these cost-optimized switches is not realized via media modules like on the SCALANCE XR-300 switches, but by means of combo ports. Consequently, the fiber-optic connections are limited to the use of LC interfaces with SFP transceivers. With the combo ports, though, the user is always provided with a combination of RJ45 port and SFP connection. Should a fiber-optic connection thus be required in an application, it can be implemented at any time by plugging in an SFP transceiver from the SCALANCE accessory spectrum. Doing so will deactivate the corresponding RJ45 port. In addition to the flexibility between RJ45 and fiber-optic interfaces, the SCALANCE XR-300WG switches are offered with different port and speed configurations, and both as a managed and unmanaged (XR-100WG) device. Variants with redundant 24 V DC or 100-240 V AC power supply (50/60 Hz and IEC connector) are available. This design also convinces with optimal dimensions for the 19" devices. Thanks to their low mounting depth, 19" rack cabinets can even be space-savily equipped from both sides.

Broad spectrum without compromises

The new SCALANCE XR-300WG work-group switches from the product family of layer 2 managed rack switches represent the cost-optimized entry into the range of Industrial Ethernet rack switches. The switches with their up to 28 ports are the optimal solution for industry-oriented applications, such as consolidation points, and control rooms.

Thanks to their high port count and seamless integration into PROFINET networks (end-to-end PROFINET diagnostics and integrated ring redundancy), they offer the right answer to all networking concepts in the context of industrial digitalization.