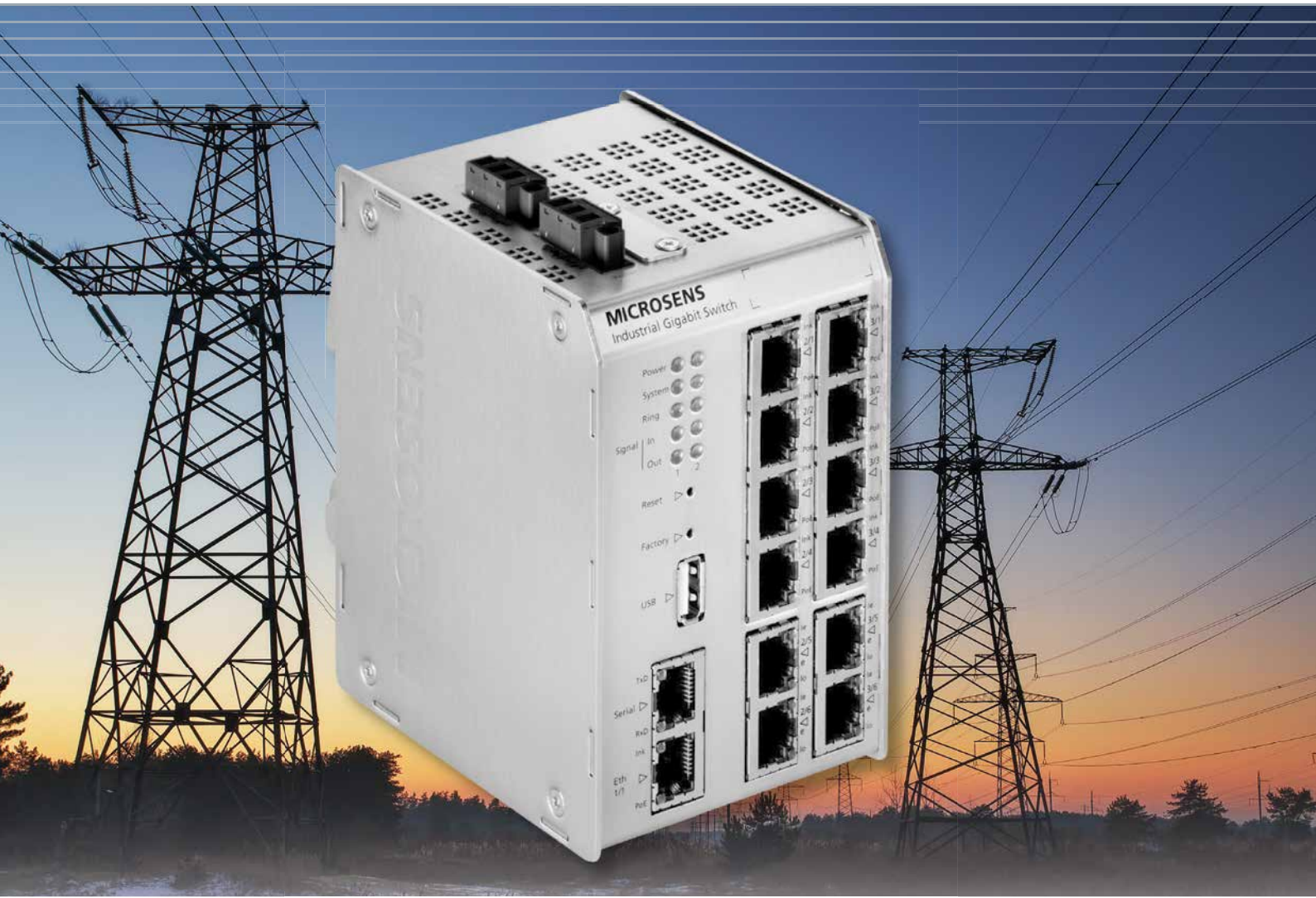


ity Dependable automation **Maximum availability**
Maximum availability Shortest recovery times
High degree of security Dependable automation

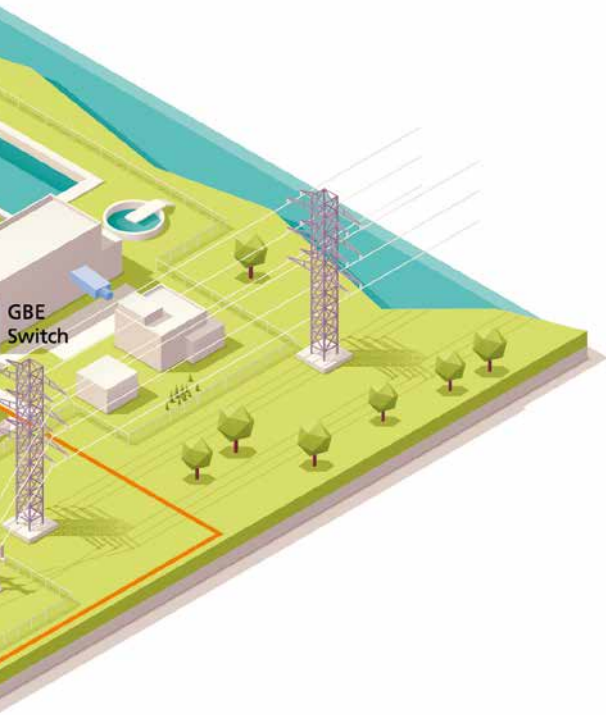
MICROSENS



POWER SUBSTATIONS

High available switches for power substations

 Made
 in
 Germany



TOP FEATURES

- Gigabit performance with Energy-Efficient Ethernet
- Power-over-Ethernet+ (802.3at), maximum of 30 W per port
- Extended temperature range
- Compact metal housing for DIN rail assembly
- Robust design, extension modules available
- Redundant power inputs
- Linux kernel, open standards, long-term availability
- SD card for firmware and configuration
- Fault tolerance with minimum recovery times

POWER SUBSTATIONS

Dependability even under the most unfavourable conditions

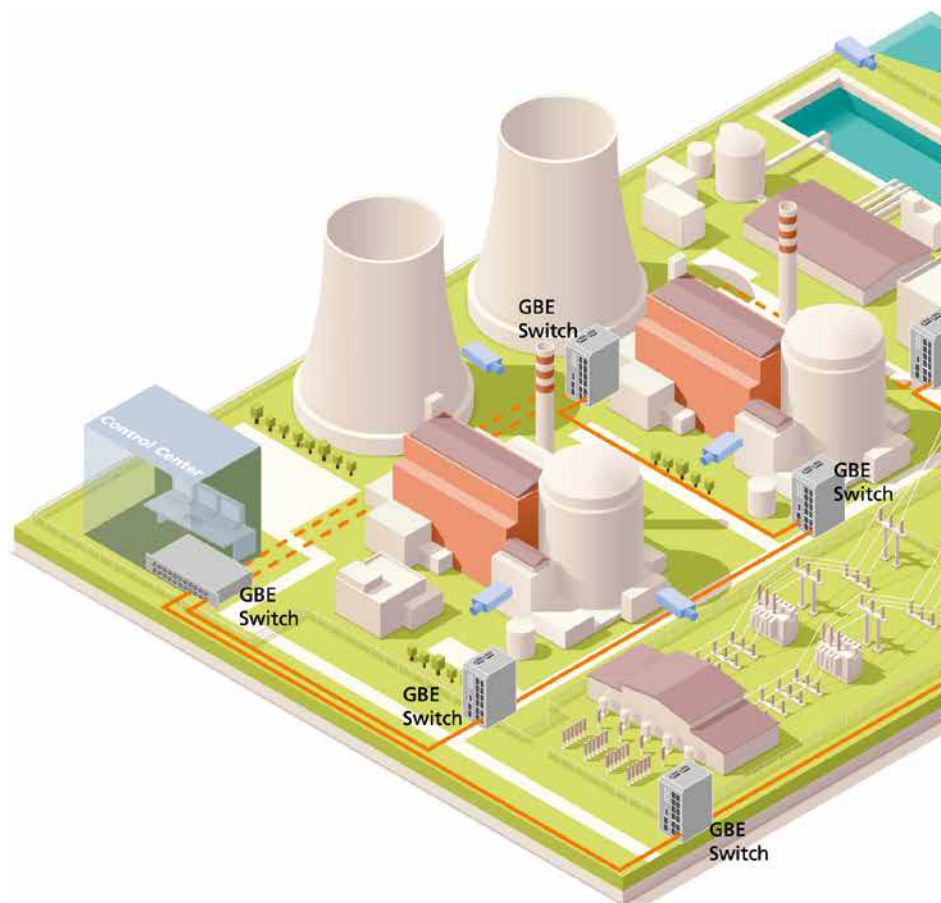
A networked power supply is dependent on components that work without compromises: robust and reliable, powerful and flexible, compact and modularly extensible, with intelligent redundancy concepts and the shortest recovery times – in a nutshell: Profi Line.

The Profi Line series from MICROSENS was developed for networks which depend on top reliability even under the most unfavourable conditions. With certainty, as proven by the extensive security features with which the Profi Line devices are equipped.

Energy management in the Smart Grid

Energy distribution systems (power substations) are the key node in the electrical network. In the course of the energy turnaround, the supply of energy is becoming an increasingly complex network of decentralised power plants. Driven by the growing use of renewable sources of energy, whereby even end-users generate electricity and feed into the supply grid situationally, the intelligent control of the network is becoming increasingly important.

In the Smart Grid – the intelligent power network – energy management is of the utmost importance. Electricity has to be provided and distributed according to demand. Here it is not only a matter of managing electricity from diverse producers – from the private photovoltaic array to the large power station – but also of controlling the electricity demand and balancing out fluctuations. Power substations are therefore evolving from simple transformer and distribution stations into intelligent control centres in the networked energy supply system.



Dependable automation for top availability

The increasingly varied tasks and heightening complexity of electrical power supply demand ever higher levels of automation. Especially in decentralised networks in which personnel cannot always be on-site, efficient remote maintenance and reliable remote monitoring are becoming more and more important. Deviations from the normal state and most essentially faults have to be detected, reported and eliminated as quickly as possible. If the power supply goes down, it is not only annoying for those affected and costly for industrial operations in particular, as a result of the cross-border power plant network and the growing networking of diverse electricity producers, there is the risk of a chain reaction that can propagate into distant parts of the network.

Maximum availability and reliability, the lowest possible downtimes and shortest possible recovery times in the event of a fault, are indispensable. Robust components that meet major challenges in energy networks and work stably and reliably under adverse circumstances are crucial.

Dependable operation even under the most unfavourable conditions

The harsh environmental conditions in power substations exposes the communication components to elevated stresses. Intense electromagnetic fields caused by high voltage lines and switching processes, vibration, moisture and extreme temperature fluctuations call for particularly robust devices. The Profi Line series of switches from MICROSENS are ideally equipped for adverse environmental conditions. With their uncompromising design aimed at reliability and security, the models for power substations ensure dependable network operation even under adverse environmental conditions. Industrial ring structures can be established both via SFP ports or with copper connections for enhanced fault tolerance. In the event of failure, a special mechanism detects failure of a network node or interruption of a trunk and ensures automatic reconfiguration of the network within a few milliseconds. The switch operating system, firmware and configuration data are saved on an SD card. Should hardware have to be replaced, the SD card is simply reconnected and the new switch automatically accepts all the configuration data – the shortest possible

recovery times thanks to innovative solutions. The SD card can be replaced by internal maintenance personnel without special IT knowledge, which significantly reduces operating costs.

Better safe than sorry

The IP-based world is increasingly vulnerable to attacks. Hackers are targeting supply institutions more than ever before. The Profi Line series of switches from MICROSENS therefore offer heightened security that already begins on the switch level, long before the protocol and operating system level. Extensive security features, such as port-based authentication according to the 802.3x standard with dynamic VLAN assignment and highly secure protocols for device management, ensure a particularly high degree of security. In order to optimally integrate the switches in existing security concepts, the security features in the MICROSENS switches can be switched on and off individually. An internal log file records all system events, so what occurred when can be identified any time without any gaps.

SOFTWARE FEATURES

Integrated device management

- High-performance CPU with Linux kernel for high system stability by encapsulating function modules
- Functional scope can be expanded with firmware updates
- IPv4 and IPv6 Dual Stack already integrated
- Support from 256 VLANs
- Spanning Tree Protocol (STP/RSTP/MSTP)
- Quality-of-Service (QoS) with 4 priorities per port
- Jumbo frames up to 10 kBytes
- LLDP and LLDP-MED for topology detection

Management interfaces

- Web Manager with powerful graphic user interface
- SNMP for integration in management system platforms
- Convenient CLI for automation with scripts
- Integrated SFTP server for direct access to device files, e.g. log file, configuration, CLI scripts.

NMP (Network Management Platform)

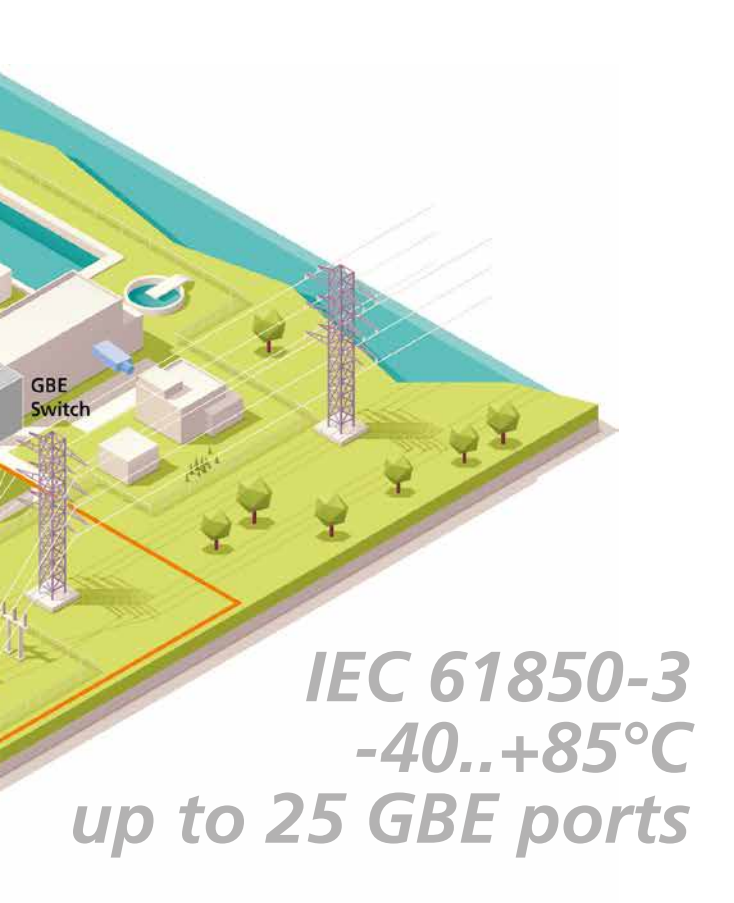
- Integration in MICROSENS NMP software for easy and efficient configuration, administration and monitoring of networks.

Security features

- Port-based authentication according to 802.1x with dynamic VLAN assignment
- Secure protocols for device management, which can also be switched off individually
- Internal log file for logging system events

Highly secure protocols for device management

- HTTPS for web manager and NMP
- SNMPv3 for management integration
- SSH for Command Line Interface (CLI)
- SFTP for file access



IEC 61850-3
-40..+85°C
up to 25 GBE ports

Quality Made in Germany

The Profi Line series was developed from scratch at the German site – with its own development team for hardware and software and proprietary expertise. Development and processing "Made in Germany" significantly contribute to product quality.

The Profi Line series from MICROSENS is the ideal choice wherever the highest demands are placed on fault tolerance, availability and the shortest possible recovery times.

Profi Line Rack



The Profi Line Rack makes the advantages of the Profi Line available in a 19" design. Like devices for mounting on DIN rails, the Profi Line Rack Switch was developed for use in harsh environments. It offers a total of 25 Gigabit Ethernet ports of which eight can be expanded to fiber optic connections as combo ports with SFP modules. A total of 16 copper ports offer PoE/PoE+ functionality with which the terminal devices connected can be supplied with electricity economically and without additional cabling work. With its compact design of 1 HU, like Profi Line Modular it has two alarm inputs and outputs respectively.

As with all Profi Line series switches, the Profi Line rack switch was designed for the greatest availability and shortest recovery times. Redundant ring structures can be established both via SFP ports or with copper connections. In the event of failure, a special mechanism detects a faulty network node or interruption of the connection and ensures automatic reconfiguration of the network within milliseconds.

PRODUCT PRESENTATION



Profi Line +

Efficiency and economy without compromises: The Profi Line + series of switches offer seven Gigabit ports with extremely compact dimensions at an attractive price. Here performance and security are top priorities, both in network and access security, alongside the various switch functions themselves. Applications like Wireless LAN and IP video surveillance profit from the integrated power supply of terminal devices with PoE+ according to the IEEE 803.3at standard with up to 30 W per port, which the switch provides on four 10/100/1000Base-T connections.

Furthermore, the switch has two combo ports with RJ-45 connection and SFP slot. These allow a redundant uplink either constructed with copper cables or fiber optic lines. In the event of a line break, the ring protocol ensures continuing availability. The Switch itself can be supplied via the RJ-45 uplink port as a powered device with Power-over-Ethernet thus ensuring enhanced switch availability if the conventional power supply fails.

Sensors and actuators can be integrated via the two I/O ports of the switch or the switch can be connected to an existing alarm solution.

Profi Line Modular

The Profi Line Modular switches from MICROSENS offer top performance and flexibility in confined spaces. The modular design enables expansions tailored to needs, which limits the initial investment to the minimum necessary.

Even the basic switch module offers thirteen gigabit ports, of which four, as combo ports, can be expanded to fiber optic connections. Despite its space-saving design, it has two alarm inputs/outputs, for example for cabinet monitoring or integrating a sensor/actuator. The copper ports offer PoE/PoE+ with which the terminal devices connected can be supplied with electricity economically and without additional cabling work. The switches themselves can also work without their own power supply, supplied via PoE/PoE+ as powered devices. For maximum scalability, expansion modules with six or twelve Gigabit Ethernet ports are available that can simply be connected on the side to match demand. The expansion modules also have Gigabit combo ports with which an impressive number of fiber optic connections can be achieved economically and in dependent on usage.



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High degree of security Dependable automation Maximum availability Shortest recovery times

MICROSENS IS KNOWN FOR COMPETENCE ON THE SECTOR OF ACTIVE FIBER OPTIC SOLUTIONS

For 20 years, MICROSENS has been offering high-quality, active fiber optic components for corporate networks, manufacturing companies, the industrial sector, and access networks. Development and manufacture "Made in Germany" make a significant contribution to the product quality.

