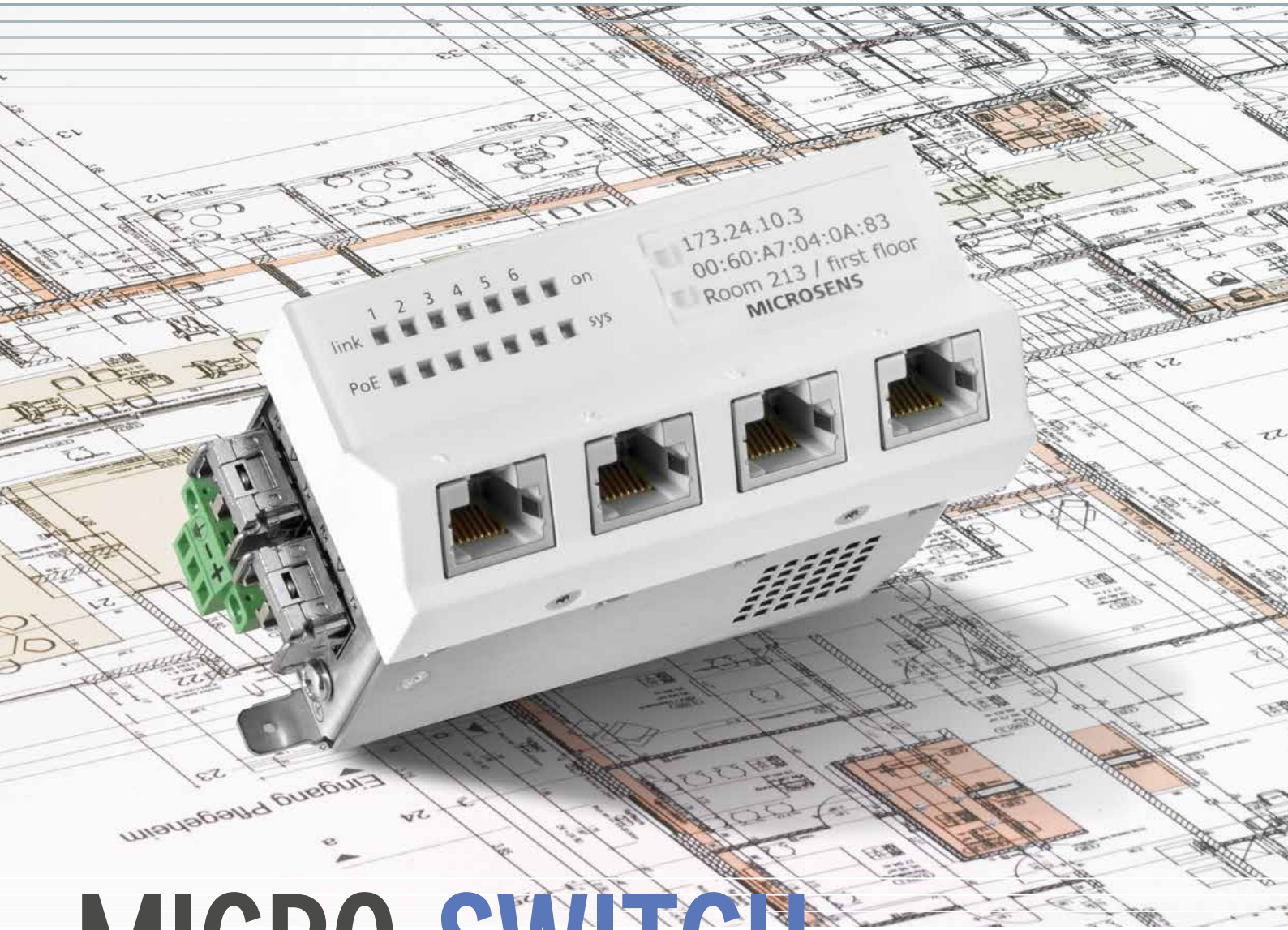


Performance Extensive Security Functions Maximum Performance  
Extensive Security Functions Maximum Investment Protection  
Availability Maximum Performance Extensive Security Functions  
Performance Top Network Availability Maximum Performance

# MICROSENS



# MICRO SWITCH

High-performance networking technology for modern buildings

 Made  
 in  
 Germany



## TOP FEATURES

- Four Gigabit end device connections (10/100/1000Base-T), optionally with PoE+
- Top network availability due to two Gigabit uplink ports
- Optimal performance and fault tolerance
- Extensive security functions
- Shortest possible recovery times thanks to a microSD card with firmware and configuration file
- High cost-effectiveness verified by independent reports
- Telecommunication rooms on the individual floors no longer required
- Investment protection through high-performance, future-proof fiber optic lines
- Optional microApps for Smart Building functions
- Internationally standardised 45mm fitting dimension for installation in cable ducts, floor boxes, media columns, connection boxes, and furniture
- Extensive accessories for optimal installation
- Available in white, graphite grey or silver
- Variants for horizontal and vertical installation
- Specially developed variants for hospitals and for industrial environments

# MICRO SWITCH

## Secure – high performance – cost-effective

The Gigabit Ethernet Micro Switches from MICROSENS are the key element in the highly efficient networking of modern buildings. The intelligent combination of fiber optic uplink and copper user ports enable the technical advantages of fiber optic lines to be exploited for floor cabling. Whether an office application, IP telephony, IP security technology, building technology, or applications in the Smart Building – Micro Switches from MICROSENS offer users the performance, security, and economy they need in future-safe, decentralised data networks.

## Evolution to decentralised networks

The classical concept of application-neutral, structured cabling with copper wiring is now over 20 years old. Originally intended for office IT, a large number of new applications have arisen over the years, including IP telephony, wireless LAN, IP cameras, access control, time stamping, and now even building technology. The demands placed on the performance and security of the data network have also grown incessantly ever since. The initially classical, centralised approach has developed into a decentralised infrastructure, which enables higher performance, enhanced security, and conductor lengths exceeding the ninety metres to which classical copper cables are restricted. The new version of DIN EN 50173-2:2011-09 stipulates a cabling structure with end-to-end optical fibers from the building distributor through to the user area. Optical fibers through to the office or simply Fiber To The Office (FTTO).

## Security

Micro Switches – smaller than two conventional double sockets – are installed in decentralised networks in the user area. They allow security functions to be brought to where they are needed: to the edge of the network, to the user connection. Authentication in accordance with the recommendations of the German Federal Office for Information Security (BSI) and port security according to IEEE 802.1X are just two examples of security features that can be defined directly at the workplace Micro Switch. In conjunction with access control, it is even possible to block connections in a room once the employees have shut down their PCs or have left the building. The best protection against unauthorised access is to ward it off right at the periphery of the network.

## Reliability

Companies and authorities are dependent on a functioning data network. Micro Switches from MICROSENS are known for their reliable, robust electronics. For years, MICROSENS has not only equipped office buildings with network components, but also airports, power stations, and industrial installations – all applications demanding reliability and availability. Redundancy concepts can be implemented

pragmatically with Micro Switches, from the simple interconnection of two Micro Switches through to fully redundant structures for fault-tolerant networks.

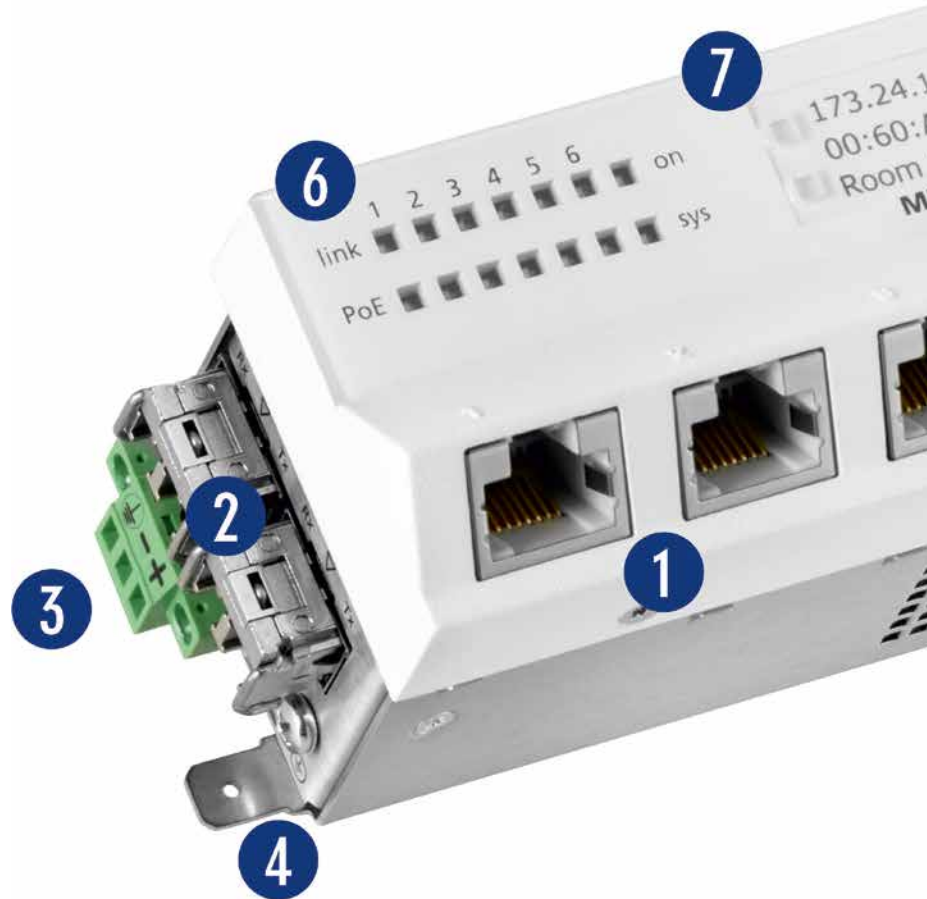
## Cost-effectiveness

Optical fibers permit far greater line lengths than copper cables. Floor distribution units that require their own telecommunication rooms with air-conditioning and an uninterruptible power supply are rendered unnecessary, which significantly reduces setup costs (CAPEX) and operating costs (OPEX). Low operating costs are also attributable to the tool-free snap-in mounting of the Micro Switches. The extensive installation accessories allow them to be installed almost everywhere: in the cable duct, in floor boxes, in media columns, in connection boxes, as well as in high-grade furniture. The cost-effectiveness of fiber optic based, decentralised infrastructures has been verified in independent surveys and in numerous projects. A study

conducted by WIK Consult GmbH, for instance, confirms that FTTO provides cost advantages over the classical concept with copper cables already for above two hundred users. As the number of users increases, the cost benefits become even more significant.

## Added value

With their enormous processing power, switches have long since offered more than just management of data traffic. MicroApps – small programs as they are known from the smartphone – allow switches to adopt additional tasks, such as controlling building technology: lighting, shading, heating, air-conditioning, access control, time stamping, and much more besides – users in the modern Smart Office adapt their environment to their individual needs, which serves to raise motivation and productivity. Greater convenience and security, while at the same time ensuring a high degree of cost effectiveness. Simply MICROSENS.





# TECHNICAL FEATURES

- 4x 10/100/1000 Mbps local user connections
- Optional PoE+ functionality according to IEEE 802.3at on all TX ports
- Two Gigabit Ethernet uplink ports for enhanced reliability through redundancy, such as Dual Homing and ring structures, optionally
  - with two SFP slots for networks purely based on fiber optics
  - one SFP slot for optical fibers and an RJ-45 connection for copper data lines
- Permanent function monitoring and alerting in real time through the app
- Convenient administration via Web, Telnet and SNMP interface, and MICROSENS NMP software. Integration of / interface to already existing network management systems
- Extensive options for automation with a command line interface and integrated script language
- Firmware and configuration on the microSD card for the shortest possible recovery times
- Tamper-proof housing with IP30 protection class
- High security level through the application of encrypted protocols, such as SSH and HTTPS
- Authentication, port security according to IEEE 802.1X, Radius, compatible to all conventional NAC solutions
- LLDP autodiscovery
- QoS (prioritisation, DiffServ), VLAN (IEEE 802.1q, 802.3ac), IGMP snooping, IPv4/v6 dual stack
- Power supply optionally directly from 230 VAC, with individual 48.56 VDC power supply unit or optionally via the data cable (PoE PD)
- High energy efficiency through the use of state-of-the-art chip technology, Energy-Efficient Ethernet (EEE)
- Fast, tool-less installation by means of snap-in installation

## Individual solutions with microApps / scripting

With their enormous computing power, Micro Switches are not only able to manage data traffic, but also to adopt additional tasks. MicroApps – small, autonomous software modules – can control building technology and adapt to the users' individual requirements and wishes: lighting, heating, air-conditioning, darkening, network access, control of electrical devices, and much more besides for the modern, networked Smart Office. And the scripting language micro-Script allows professional users to write their own scripts and upload them to the Micro Switches.

# MICRO SWITCH for FIBER

## 1 Gigabit copper ports (4x)

Four high-performance 10/100/1000 Mbps connections for PC, IP phone, printer or any other IP-capable terminal device, optionally with PoE+.

## 2 Gigabit uplink ports

One, or optionally two, Gigabit uplink ports for maximum network availability and reliability, two SFP slots for purely fiber-optic-based networks or one SFP slot for optical fibers or an RJ-45 connection for copper data lines.

## 3 Power supply connection

Power supply optionally with 230 VAC from the power or optional DC version for external DC power supplies. Optional PoE/PoE+ version with 48 VDC input.

## 4 Earthing terminal

Terminal for the connection to the earth potential. The earthing of the switch can be done either via the earthing lug and a standard cable shoe or the earthing screw.

## 5 Expansion port

Serial RS-232 console connection for optional accessories, also configurable as RS-232 device server.



# BENEFITS OF DECENTRALISED DATA NETWORKS

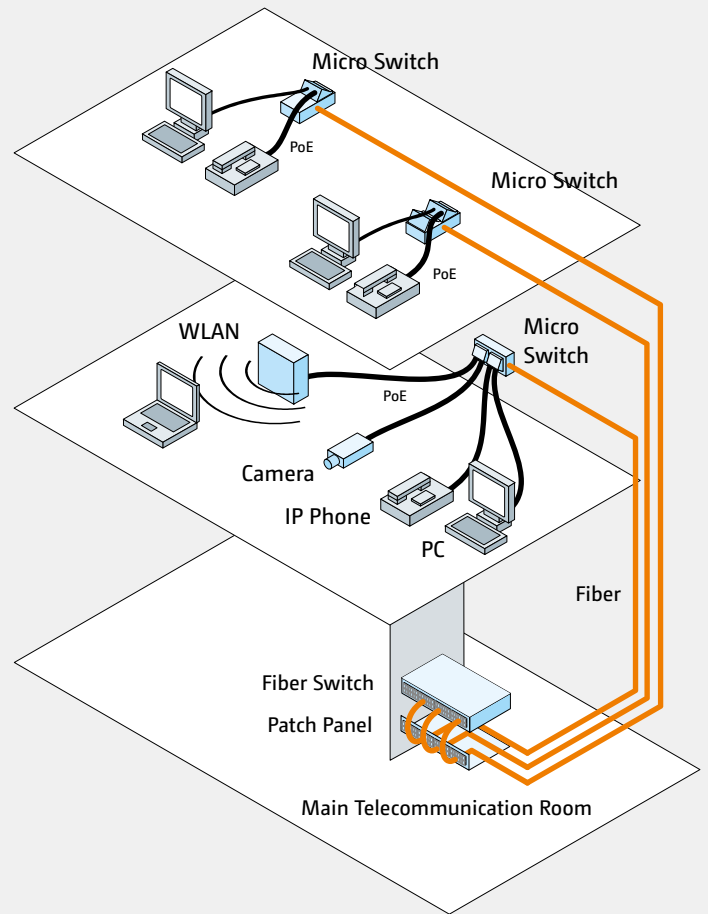
The concept of classically structured cabling was first standardised back in 1995 in DIN EN 50173. However, in the meantime the applications and therefore also the requirements for a high-performance IT network have evolved: Distributed systems like wireless LAN, IP telephony, IP cameras, devices and installations in building technology, and even LED lighting have become part of the data network. In addition, there are more stringent security requirements, as demonstrated by ever-more threatening and technically sophisticated attacks.

Modern networks based on fiber optics with decentralised architecture offer numerous technical and economical benefits compared to conventional solutions. This already starts with the maximum line length: Even the best copper lines are limited to a length of 90 metres. Fiber optic lines have long been used for higher distances and for the inter-connection of the distribution units. The step of routing the fiber optic lines even closer to the user and to do completely without copper lines is as logical as it is consistent.

The new version of DIN EN 50173-2:2011-09 stipulates just this cabling structure. For a good reason: Optical fibers permit line lengths of up to 550 metres (multimode fibers) or 10 kilometres (single-mode fibers). A single, centralised IT systems room is sufficient even in large buildings, which is located where it is least in the way. Floor distribution units that require their own telecommunication rooms with air-conditioning and an uninterruptible power supply are rendered unnecessary. This is also possible between buildings, which considerably simplifies the administration of the data network in building complexes, extensive company sites, industrial installations, as well as in holiday and hotel complexes. Problems with earthing and potential equalisation, which may occur on copper lines, particularly in historically grown buildings, do not apply with conventional metal-free fiber optic lines either.

Copper cables have a comparably large outer diameter which leads to thick cable bundles and, thus, to high fire loads. Optical fibers require little space and lead to significantly lower fire loads.

Decentralised networks based on fiber optics have been established for years. They have proven themselves in public administrative buildings, in the higher education sector, airports, and in high availability applications. They originate in large office buildings, hence the name:



FTTO – Fiber To The Office. FTTO networks are unsusceptible to electromagnetic interference and do not emit any interference themselves. Besides greater line lengths, they also offer generally higher data rates. FTTO networks can even be expanded during operation, without any interruptions of business, and offer network security with their numerous security features on the Micro switches on-site precisely where it is required: at the outer edge of the network.

## TO THE OFFICE

### 6 LED display

Clearly arranged display of the following functions: readiness to operate, link status, data activity, PoE status, booting or reset process.

### 7 Reset and system key

Reset key for resetting the switch or for loading the configuration stored last (direct hardware function). System key to select the IP configuration via management or to restore to the factory settings:

### 8 Labelling field

Removable labelling field, specially integrated into the device cover and, thus, protected from surface cleaning.

### 9 microSD card slot

The firmware and configuration data can be stored on the microSD card. In the case of replacement, this ensures the shortest possible recovery times.

### 10 Gigabit downlink port

10/100/1000Base-T connection to a central network switch over copper lines or for the cascading to another Micro Switch.

Top Network Availability Maximum Performance Extensive Security Functions Maximum Investment Protection Maximum P  
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Maximum Investment Protection Maximum Performance Extensive Security Functions Maximum Performance Top Networ  
Top Network Availability Maximum Performance Extensive Security Functions Maximum Investment Protection Maximum

# MICROSENS STANDS FOR COMPETENCE IN THE ACTIVE FIBER OPTIC SOLUTIONS SECTOR



[www.microsens.com/ftto](http://www.microsens.com/ftto)

**MICROSENS**  
euromicron group

MICROSENS GmbH & Co. KG  
Küferstr. 16  
59067 Hamm  
Germany

Tel. +49 (0)2381/9452-0  
Fax +49 (0)2381/9452-100  
info@microsens.com  
[www.microsens.com](http://www.microsens.com)

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