



MICROSENS

WHITE PAPER

Decentralised switching
infrastructure for
modern buildings



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The trend towards IP-based system solutions in modern buildings continues unabated. Whether in office communication, video surveillance, building automation or building control technology - devices, systems and modules are increasingly equipped with an IP connection.

The conventional concept of building infrastructure is now twenty years old and can hardly keep up with current developments. Distributed services and an increased need for security necessitate a decentralised infrastructure concept. As a technology specialist, MICROSENS has developed Micro Switches for this purpose that offer both technical and financial advantages over conventional infrastructure solutions.

Starting with the central mainframe, the development has led to data networks with structured cabling and workplace PCs. This is part of a sustained trend towards networks with decentralised intelligence. Cabling with decentralised switching architecture, such as Fiber To The Office (FTTO), has long since become established for cost-efficient in-house networking in countless projects. The underlying principle is remarkably easy: High-performance data lines are routed through to the user area. Here a Micro Switch is installed as an active element to provide flexible copper connections for the terminal devices.



MICROSENS Micro Switch furniture inlet enclosure.



MICROSENS Micro Switch mounted in cable duct.

Advantages of decentralised Micro Switches

Micro Switches allow monitored, manageable devices to be deployed in the user area. Hence, a network management system can monitor whether and with what performance the connection through to the user is working.

Security mechanisms are implemented in Micro Switches from MICROSENS that were previously the reserve of large central switches and with which professional networks are managed and protected. They also allow terminal devices connected with the network via a Wireless Access Point or an IP phone to be securely authenticated. A big plus with the MICROSENS solution: Non-authorized terminal devices are switched to a guest or quarantine VLAN rather than completely blocking the switch port. Therefore, devices that are already authenticated, including IP phones, to which a problematic terminal device is connected, remain in the network and thus fully functional.

For simple and especially cost-effective access management, a switch port can also be restricted to a single MAC address. The port is then permanently assigned to a terminal device and other devices are denied access. Intrusion into the network by cascading, for example if a hub is connected to the relevant switch port, is easily and effectively prevented. Further measures, such as a RADIUS server, are not necessary for this.

Decentralised solutions for copper and glass fiber lines

As a technology leader for decentralised switching concepts, MICROSENS offers solutions for glass fiber as well as for copper lines. The use of Micro Switches with copper uplink is an effective and cost-efficient solution, especially in expanding existing copper-based networks. Existing lines can be used instead of costly recabling or even routing new cable, which significantly reduces setup costs. Another plus: Fewer lines mean thinner cable bundles and lower fire loads.

Redundancy solutions are also available for copper and glass fiber lines for increased network availability. Micro Switches can be cascaded without problems by connecting two switches to each other. Alternatively, Micro Switches can be connected via two links with one or two core switches. This dual homing offers even higher availability: Even if a core switch were to fail, the Micro Switch remains accessible via the second core switch. The Rapid Spanning Tree Protocol (RSTP) ensures reliable operation and the shortest possible switching times.

In principle a decentralised switching concept can also be implemented with desktop switches. However, a separate device has to be accommodated on the desk or close to the system, which is to be connected with the network, and in many cases also requires an additional external power supply unit, i.e. two components that take up space. Micro Switches from MICROSENS, however, are perfect for integrating in the respective installation environment.

Perfect integration

Thanks to the modern design with 45 mm rail, the high-performance Micro Switches from MICROSENS fit into all common installation programmes. They are suitable for flush mounting, installation in the cable duct or the floor box, as well as on the top-hat rail in electrical switchgear. And with the new furniture inlet enclosure, they can be stylishly integrated into various items of furniture. The space-saving solution with discreet stainless steel frame allows the Micro Switches to be attractively accommodated close to the user, for instance in the desk, in the conference table, in a lectern or counter. The enclosure is available with a lateral or in-line cable outlet to the rear, optionally with or without a 230 V socket. Furthermore, customized special solutions are also possible.



MICROSENS Micro Switch mounted in a modular table housing

Special highlight: Anti-theft protection for terminal devices

By monitoring line impedance, the Micro Switch from MICROSENS can tell whether a terminal device is connected or not. In contrast with IP-based monitoring of links using conventional switches, the terminal device does not need to be switched on for the Disconnect Monitor function implemented in the MICROSENS switches. Impedance measurements also works if the terminal device is switched off. The theft of a terminal device switched off overnight can therefore be reliably ascertained and an alarm immediately triggered. Additionally, the switch port can be disabled as a precaution. This effectively prevents an intruder from downloading malware to the network by unplugging an existing device and plugging in his terminal device.

The industry versions of the switches also have an integrated switching contact through which external signalling is possible without any special effort or expense, for example using a warning lamp or siren.



MICROSENS Micro Switch mounted in floor box

Conclusion

An infrastructure with decentralised switch architecture offers significant advantages over the conventional, now twenty year old infrastructure concept, in terms of network availability and security. Decentralised Micro Switches meet the requirements of modern buildings far more effectively with their distributed services and users' increased need for security.

Numerous projects have already proven that besides technical advantages, a decentralised concept also offers clear financial benefits.