BUILDING AUTOMATION OF THE FUTURE

smart building solutions

MICROSENS

BUILDING AUTOMATION OF THE FUTURE

Building automation over IP: With its revolutionary Smart Building concept, MICROSENS enables building automation at low cost.

Because, in contrast to bus-based concepts, the MICROSENS systems require no separate infrastructure. They make use of the existing local data network. This ensures a high degree of convenience, productivity, and security.

Decentralised and scalable control of all parts of the building can be implemented by integrating them into the IP structure. All automation functions can be limited to individual rooms – whether for heating, air-conditioning, public address, lighting, admittance and usage rights, or other functions.

This is rendered possible through intelligent network switches that communicate with individual actuators and sensors as decentralised control instances over the IP network. Special control software is installed on the switches, which covers a broad spectrum of automation processes. It can also be expanded with individual functions without great effort.

The decentralised, modular networking concept allows for a successive migration, room-by-room. Existing systems are integrated with a minimum of resources.

The decentralised concept from MICROSENS has a decisive advantage in the area of fault tolerance too: Local defects only affect individual rooms and do not result in complete system failure. The MICROSENS Smart Building solutions also profit from the tried and tested safety requirements of network communication.

With its new business unit – Smart Building Solutions – MICROSENS expands its competence into the field of building automation. The company from Hamm in Germany has been a pioneer in fiber optic technology and for 25 years a leading expert for communication solutions and provider of high-grade components for company networks, manufacturing plants, industry and access networks.

More security through fewer interfaces

Thanks to IoT, Smart Home and Smart Building, intelligent technology has found its way into building technology. This makes buildings more energy efficient, user-friendly and, not least, more intelligent. Powerful data networks form the basis for these developments. Networks that existed in parallel to date, taking up space and consuming resources.

THE FUTURE OF BUILDING AUTOMATION IS IP-BASED

Building automation and IT merge completely with IP-based MICROSENS technology. The intelligent network technology also reduces the interfaces between IT and building automation. And the best thing: As every interface is, at the same time, a point of attack in the network, potential gateways for malware and hacker attacks are permanently reduced.
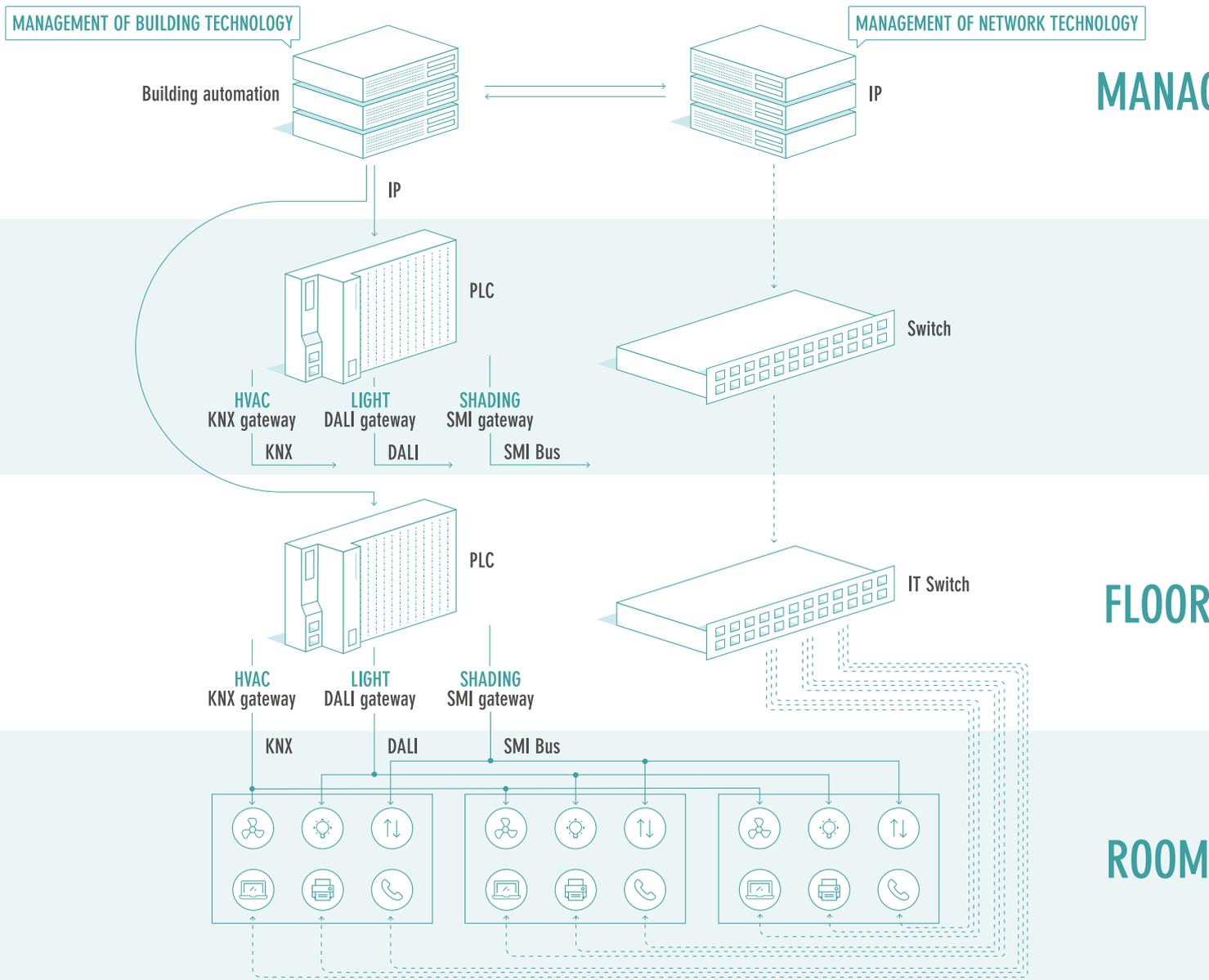
Efficient networking without cabling

Today, awareness is growing for the responsible management of natural resources, because there is only a finite supply of raw materials. Here too, IP-based technology can pay dividends: Because MICROSENS networks without doubling the amount of cabling. Especially the extensive cabling between floors can be significantly streamlined by sharing the use of the IP infrastructure. The necessary raw materials are saved many times over. At the same time, cable fires at the interfaces are a risk not to be underestimated. IP-based technology from MICROSENS scores in this regard too: Raw materials and costs are saved and safety enhanced by reducing the fire risk.

TYPICAL BUILDING AUTOMATION
Building technology and IT are separated from one another

Building automation

IP

MANAG

IP

PLC

HVAC
KNX gateway

LIGHT
DALI gateway

SHADING
SMI gateway

KNX   DALI   SMI Bus

Switch

PLC

HVAC
KNX gateway

LIGHT
DALI gateway

SHADING
SMI gateway

KNX   DALI   SMI Bus

IT Switch

FLOOR

ROOM

BUILDING AUTOMATION OF THE FUTURE: BUILDING AUTOMATION FULLY INTEGRATED INTO IT
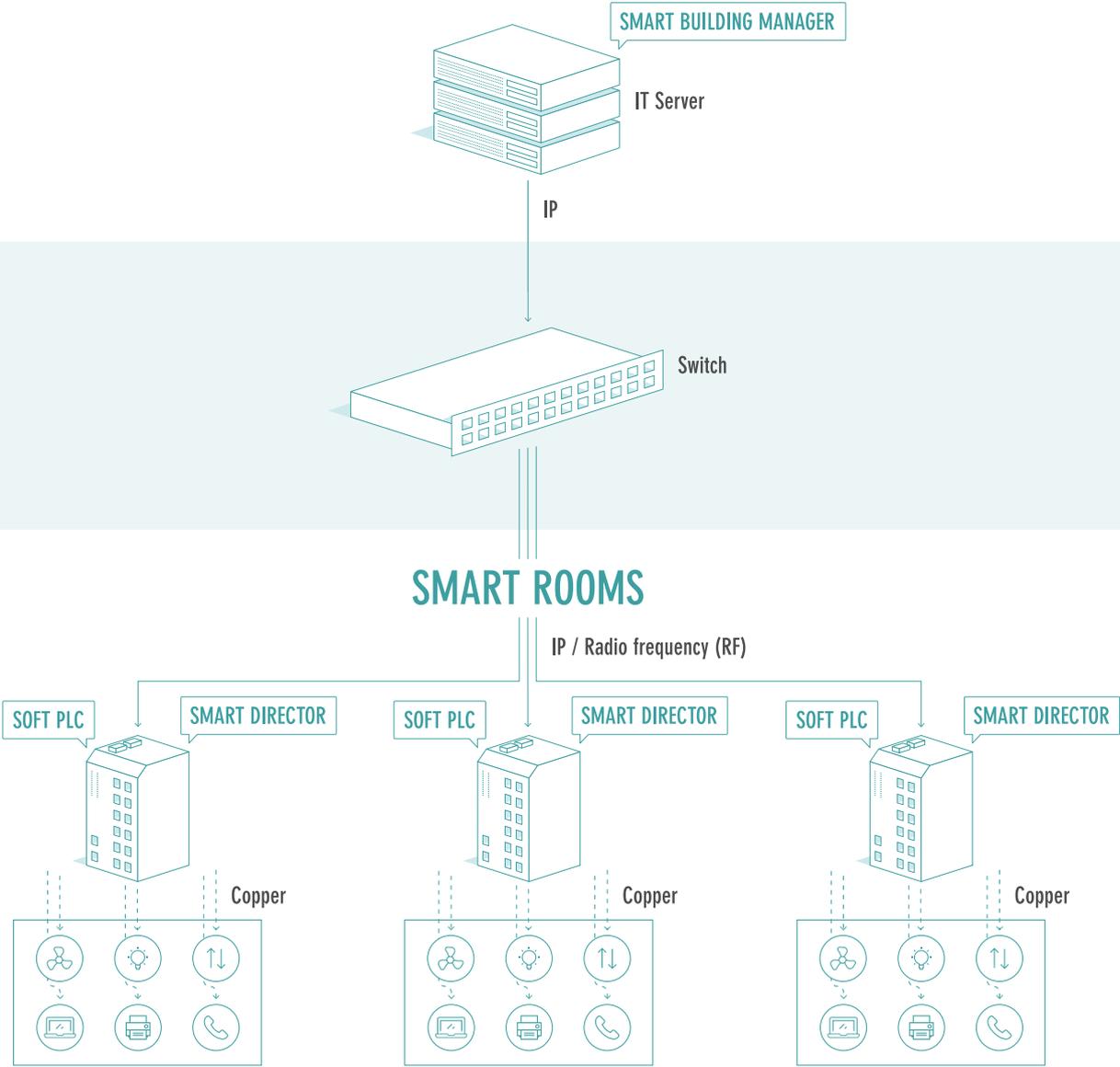
Building technology goes IP

With its revolutionary Smart Building concept, MICROSENS enables building automation over IP. In contrast to bus-based concepts, the MICROSENS systems require no separate infra-structures. They utilise the existing local data network. This ensures a high degree of convenience, productivity and security. Building automation is facing a paradigm shift.

GEMENT

SMART BUILDING MANAGER

IT Server

IP

Switch

SMART ROOMS

IP / Radio frequency (RF)

LEVEL

SOFT PLC   SMART DIRECTOR   SOFT PLC   SMART DIRECTOR   SOFT PLC   SMART DIRECTOR

Copper   Copper   Copper

LEVEL

Networking without cabling

An almost unlimited number of network addresses can communicate with one another over the Internet Protocol. IP has been perfected over the years and the network structures exist in most buildings anyway. So it makes sense to use this proven communication system for building automation. IP also enables separation between physical and logical infrastructure. This lays the foundation for software-based building automation and contemporary security measures.
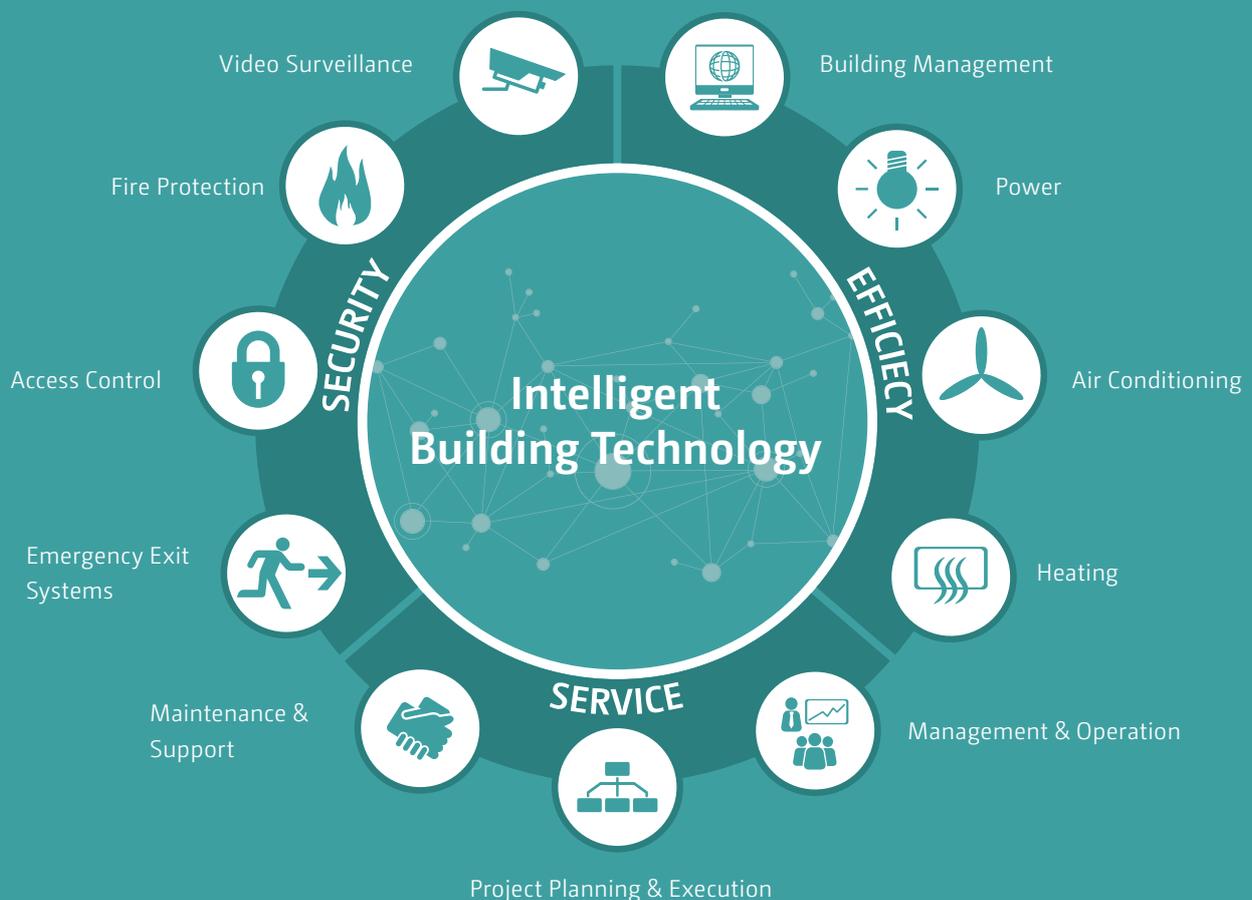
Central monitoring

With the Smart Building Manager (SBM), MICROSENS delivers the next generation of building management. The software forms a central integration point for all types of devices and services of a building automation system and perfectly maps the building infrastructure at building, floor or room level. The data prepared by the system form the basis for any decisions that may be necessary regarding resource consumption, adaptation of temperature, CO_2 concentration or humidity, as well as for predictive maintenance.

EVERYTHING UNDER ONE ROOF...

...all in one network

With IP, building automation manages to progress into the digital age. All building automation processes communicate over IP controlled by software. Unification of the automation systems that otherwise run in parallel allows the building to be adapted, maintained, or expanded flexibly and scalably. Individual components or automation processes can be controlled via software at the click of a mouse.

Bus systems will not be able to exist independently in the future. IP gateways have been developed for years now to enable communication between both worlds. The flexibility hoped for is only possible through complete IP networking. Decentralised automation organisation, in particular, calls for this. So it is clear in which direction building automation of the future is heading.

Video Surveillance

Building Management

Fire Protection

Power

SECURITY

EFFICIECY

Access Control

Intelligent Building Technology

Air Conditioning

Emergency Exit Systems

Heating

Maintenance & Support

SERVICE

Management & Operation

Project Planning & Execution

In the digitalised building, all trades work together to form an intelligent whole that increases efficiency, safety, and comfort.

Smart Building Solutions: Decentralised building automation over IP

MICROSENS recognised the potential of the IP infrastructure early on and developed intelligent network switches to enable decentralised building automation. This innovative concept allows scenarios to be defined for each individual spatial unit. Where sensors measure defined environmental parameters, a certain setting is activated, which encompasses building technology and lighting in its entirety.

Scalable architecture

The MICROSENS automation solutions also allow existing installations and systems to be easily integrated into an IP-based environment. The entire building can be integrated into the automation solution room-by-room without additional cabling. Centralised administration is possible with Smart Building Solutions, but it is no requirement.

MICROSENS remains an open system: Devices without a direct IP connection, such as light switches, sensors, heating valves, air-conditioning units and blind controllers, can be integrated into the MICROSENS system. This connection is either wired or over a wireless connection (e.g. through the standards from the EnOcean or IP500 alliances).

MODERN BUILDING AUTOMATION

Intelligent software: The Smart Director

The core component of the Smart Building Solutions is the Smart Director, a special application (microApp) installed directly on the network switches in the rooms. They communicate between sensors, actuators, and users. The environmental parameters measured are evaluated and the corresponding commands are sent to the responsible controller units and actuators. Standard functions are pre-installed and only need to be configured - adaptations are possible at any time. In addition, users can modify functions, such as lighting or air-conditioning, with the aid of a computer or mobile device on a room-by-room basis according to individual wishes. This raises the decentralised interaction of components of convenience and productivity.

Regular self-optimisation

The energy consumption of each spatial unit can be individually measured and evaluated by the Smart Building Manager. The efficiency of each individual automation component can be optimised with this data. Thanks to the continuous optimisation process, the operating costs can be effectively reduced. Self-adaptive systems are better optimised and cheaper over a longer period, as they do not need to be mechanically adjusted and disassembled at regular intervals.

ENERGY SAVING POTENTIAL IN MODERN BUILDINGS

Heating

40%

Lighting

80%

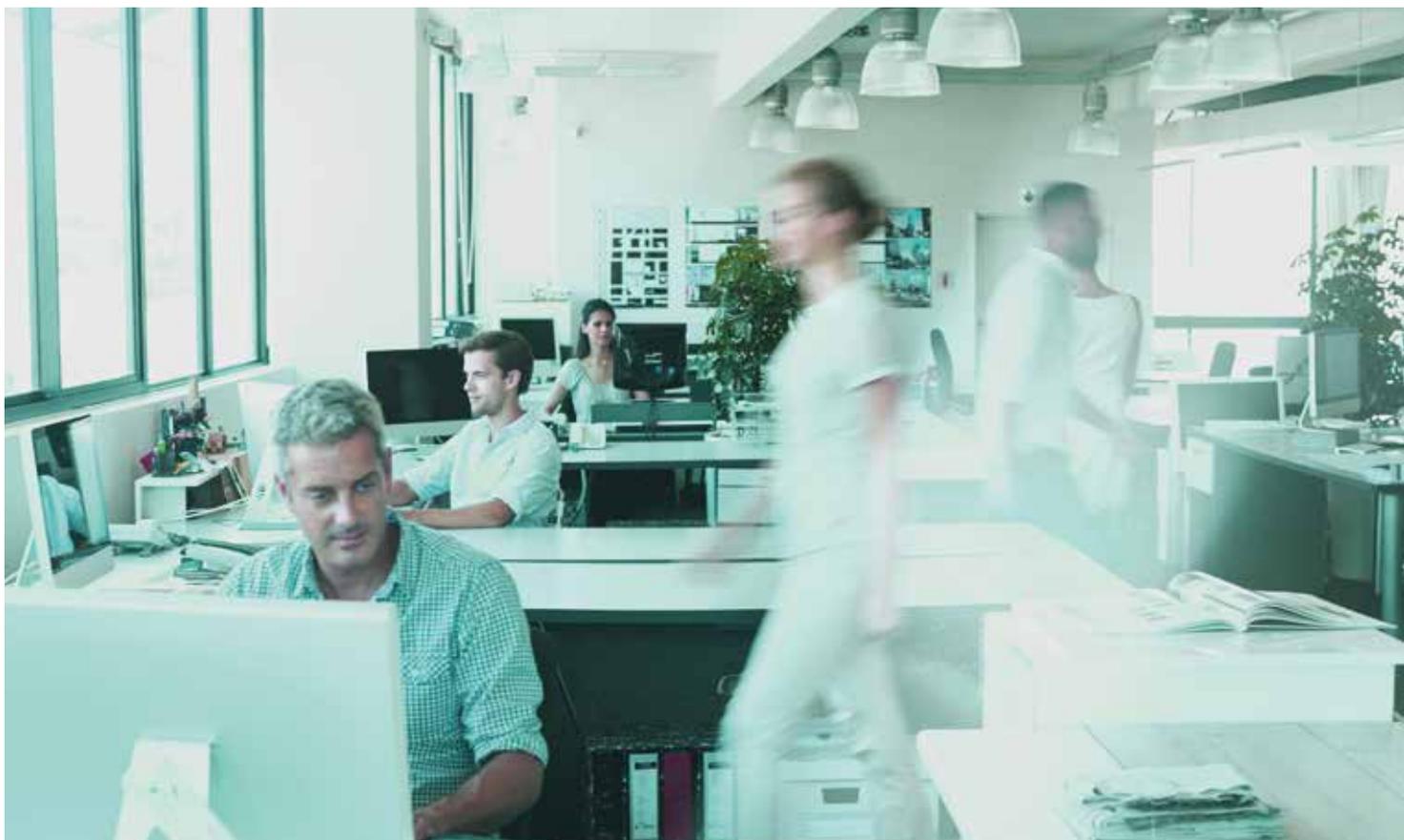**Building management system**

40%

Air conditioning

50%

FUTURE-PROOF CLOSURE OF SECURITY GAPS IN BUILDING AUTOMATION

Fail-safe network topology

The decentralised concept from MICROSENS has one crucial advantage: Local defects only affect individual rooms and do not result in complete system failure. Consequently, maintenance of the affected components can be performed during system operation. Additionally, the MICROSENS Smart Building solutions also profit from the proven and dependable safety requirements of network communication.

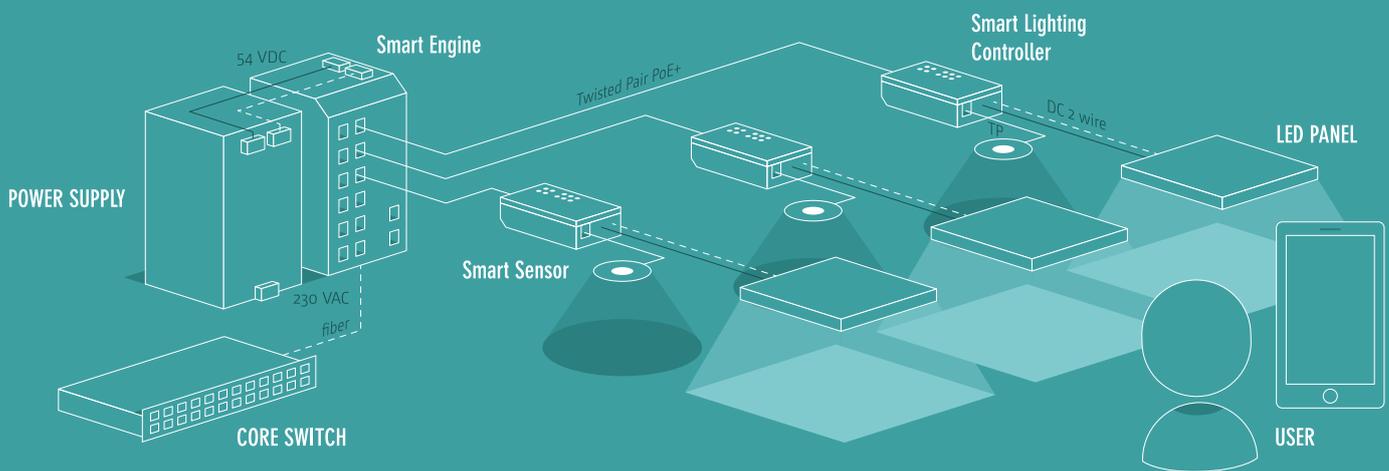## Protection through IP security standards

Systems physically cabled via a bus offer no effective means of access security. Following physical access, there are no further protection mechanisms between the attacker and the system. Security measures are already established in the IP standard. IP enables secure end-to-end encryption, authorisation and authentication. This protects against undesired access to the company network, whereby both data and the building technology are secured.

Maximum security through authentication

Unauthorised access to IT equipment is effectively prevented by MICROSENS, as work station are only activated following the user's authentication. This also renders the use of manipulated IP devices impossible. If a cable is disconnected or a computer removed, an appropriate microApp triggers an alarm.

Security through control software

The Smart Director is an additional security barrier. Communication never takes place directly between sensors, users and actuators, but always via the control software. By assigning user rights, only authenticated users and terminal devices have access to the automation system. Unauthorised devices and accesses are detected by the Smart Director and are automatically blocked.

POWER SUPPLY

54 VDC

Smart Engine

230 VAC

fiber

CORE SWITCH

Twisted Pair PoE+

Smart Sensor

**Smart Lighting
Controller**

DC 2 wire

TP

LED PANEL

USER

Smart Lighting: Intelligent network technology and economical LED technology

SMART LIGHTING: LIGHT FROM THE NETWORK

With Smart Lighting, MICROSENS firstly integrates an area into the IP network which was previously reserved for classical electrical engineering. This is made possible through the use of LEDs which can be operated at low voltage and low currents. LEDs are implemented into the intelligent building management system by MICROSENS via the network. This is made possible through unified organisation and control of building management technology and light. The energy-saving luminaires are not only controlled via IP, but are also supplied with energy with "Power-over-Ethernet".

Smart Lighting from MICROSENS is scalable – the lighting system can be expanded by new rooms, buildings, or also just individual luminaires. The intelligent functions promote productivity and well-being. They contribute to energy efficiency. Unnecessary lighting costs for corridors devoid of people or deserted underground car parks are a thing of the past.

Economic, effective, and efficient

LEDs can be even more economic if they really only light up as needed and in an adapted intensity. Through the use of sensors, Smart Lighting allows lighting to always be deployed precisely where it is required. Experts speak of up to 80 per cent energy savings. The possibility of prospective maintenance is another efficiency feature. The system detects a defect on the basis of the power
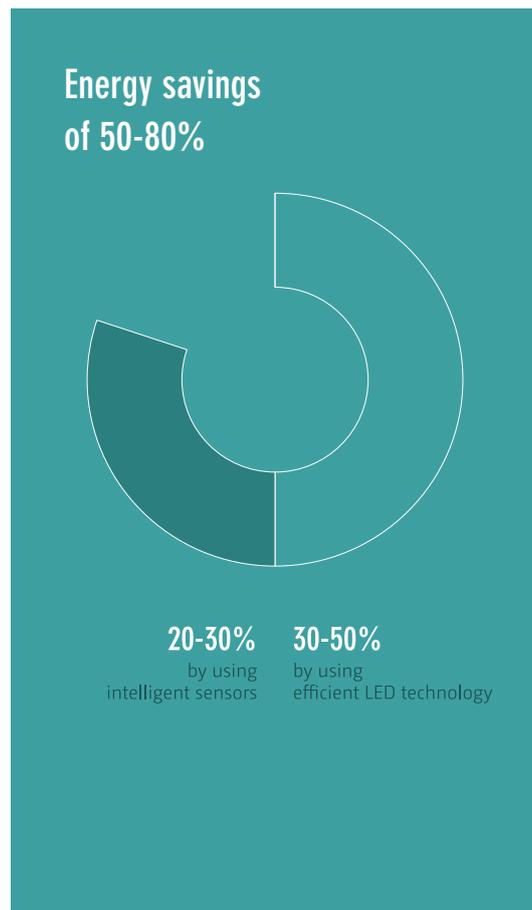
consumption data acquired and is in a position to order the technician and provide them with the necessary information.

Intelligent switches

The Smart Director on the MICROSENS switch allows far-reaching functionality. It controls light intensity depending on the time of day and incident light, the colour and quality of the light as required, and essential room automation processes besides. Special Smart Lighting controllers integrate lighting completely into the network infrastructure. So the entire building automation runs from the same system – whether lighting, public address, heating, or air-conditioning.

A higher-level software platform, Smart Building Manager, allows the user to configure and monitor all system components. Statistics as the basis for efficient room and resource management additionally provide valuable information on the occupancy of rooms and energy consumption.

Individual luminaires can be controlled directly using Smart Directorand Smart Lighting Controller. IP networking makes the logical and physical infrastructures independent of one another. This means that air-conditioning or light configurations of individual rooms can be adapted conveniently at the click of a mouse.

Energy savings of 50-80%

20-30%
by using intelligent sensors

30-50%
by using efficient LED technology

MICROSENS is one of the world's leading manufacturers of fiber optic transmission systems.

As one of the pioneers in fiber optic technology, the company from Hamm, Westphalia has developed and produced high-performance communications and transmission systems in Germany since 1993.

With its new "Smart Building Solutions" business unit, the German company extends its expertise into the field of building automation and develops systems used by the IT network as infrastructure. With this innovative approach, MICROSENS realises decentralised building automation systems for modular installation and expansion, which are easy to integrate in existing systems.

25 YEARS
MICROSENS
euromicron group