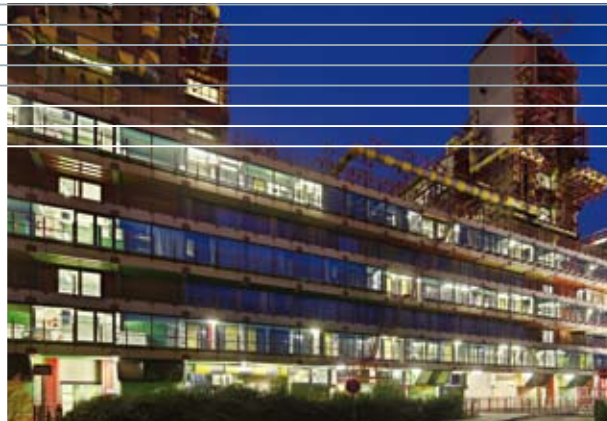


MICROSENS

Economic
fiber optic solutions
for hospitals



MICROSENS fiber optic solutions -
intelligent, reliable, high-performance



FIBER TO THE OFFICE (FTTO)



TRIPLE PLAY



LOCATION NETWORKING



INDUSTRIAL ETHERNET

MICROSENS

Dear reader,

Increasing health costs and reduced social benefits are cutting into hospital and clinic budgets all the time. Mounting pressure to keep costs down leaves institutions with less and less financial flexibility. Decision makers have long recognised that IT-supported medicine is the only feasible way of providing quality patient care while maintaining a competitive business edge.

However, consolidating the ever increasing amounts of patient management and PACS (Picture Archiving and Communication System) data places totally new demands on network infrastructure, as does the increasing integration of audio and video data. In Fiber To The Office, MICROSENS has put together a networking concept with long-term economic viability that specifically addresses these new challenges.

MICROSENS systems increase your IT-infrastructure's profitability by, for example, supporting fee-based additional services like patient Internet or IPTV and thus generating additional revenue. As a German developer and manufacturer of high-performance fiber optic components, we have successfully supported a number of projects in the health care industry by providing reliable products and excellent consultation. Our work ranges from future-proof Fiber To The Office in-house networking to data center links to conceptual designs of 10/40G transmission technology based intercampus networks for hospital groups.

On the following pages, you will learn more about how you, as a health care organisation's purchasing or IT-decision maker, can benefit from future-proof network structures incorporating MICROSENS' fiber optic solutions.

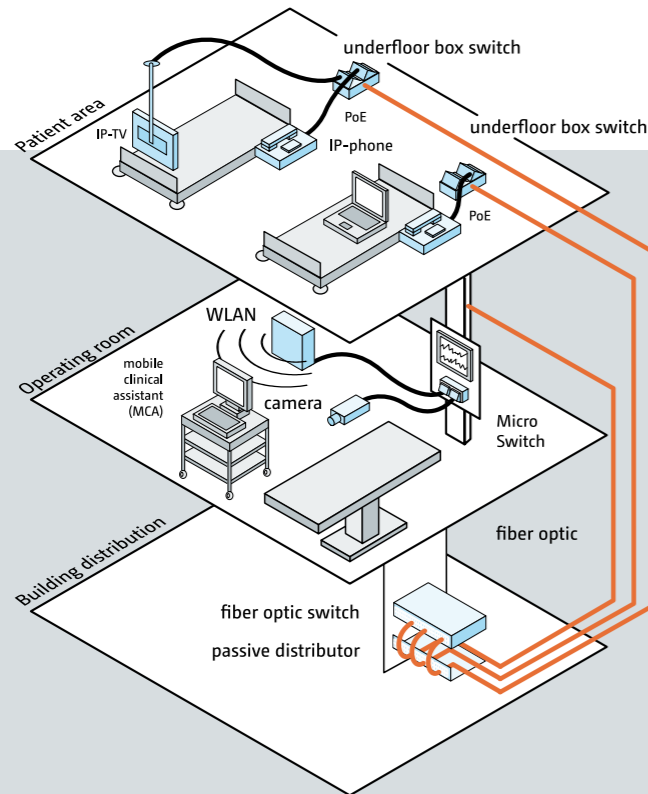
Enjoy reading this brochure!

(FTTO)

Fiber To The Office

Economic in-house networking as a basis for efficient medical business procedures

MICROSENS' Fiber To The Office provides specialists and health care workers with reliable patient data delivery using maximum bandwidth. In regard to the high requirements for EMC stability of hospital networks, fiber becomes also attractive in terms of investment costs (CAPEX) compared to shielded copper cables. The system uses future-proof fiber optic cables with the high range necessary to span the large distances between clinic areas, thus making numerous additional distributor cabinets in the building unnecessary. The continuous extension of the fiber optic lines into the user area is one of the fundamental ideas behind FTTO. Fiber optic technology guarantees the system's long useful life even through multiple technology upgrades. Clinic managers and technical directors are thus ensured of long-term investment protection and can plan IT-cost management with confidence.



MICROSENS FTTO Switches enable extension of the fiber optic network into the tertiary cabling area (cable trunking, floor boxes, wall and table installations)



The MICROSENS FTTO concept combines the advantages of future-proof fiber optic networking with the flexibility of copper based twisted pair terminal connection technology. FTTO thus forms an important building block of a more cost-effective system of modern medical care.

Higher energy efficiency and lower maintenance costs thanks to streamlined IT-structures

The collapsed backbone architecture employed by FTTO significantly reduces installation and maintenance costs by eliminating the need for storey distribution rooms. This creates a streamlined, energy-efficient IT-infrastructure and increases the surface area which can be used profitably instead. It also significantly reduces the total volume of cable needed. As far as the health care industry's strict compliance standards are concerned, the system provides marked advantages, both in terms of general network availability and on general risk assessment parameters such as fire propagation.

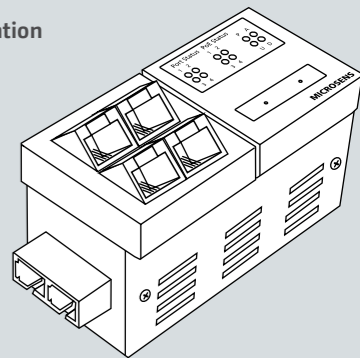
Power-over-Ethernet use for terminals

In the FTTO concept, the MICROSENS Micro Switch forms the link between the fiber optic cabling and the twisted pair based terminal connections. PoE (Power-over-Ethernet) makes it possible to power telephony and surveillance solutions cost-effectively using twisted pair cabling. WLAN solutions can, for example, serve as the foundations for mobile data access systems or for cost lowering VoIP solutions.

Tool-free installation, flexible assembly, medical approval

MICROSENS FTTO Micro Switches are suitable for a wide variety of installation scenarios. The devices also provide a number of technical advantages.

- Snap-in mounting for cable trunks, under-floor tanks and control cabinets – no tools required
- Fanless design – highly reliable and technologically stable
- Professional and hygienic device assembly
- High performance thanks to Gigabit Ethernet technology
- Intelligent management software (NMP) makes administrative work simple
- Integrated security measures such as 802.1X authentication, VLAN and QoS

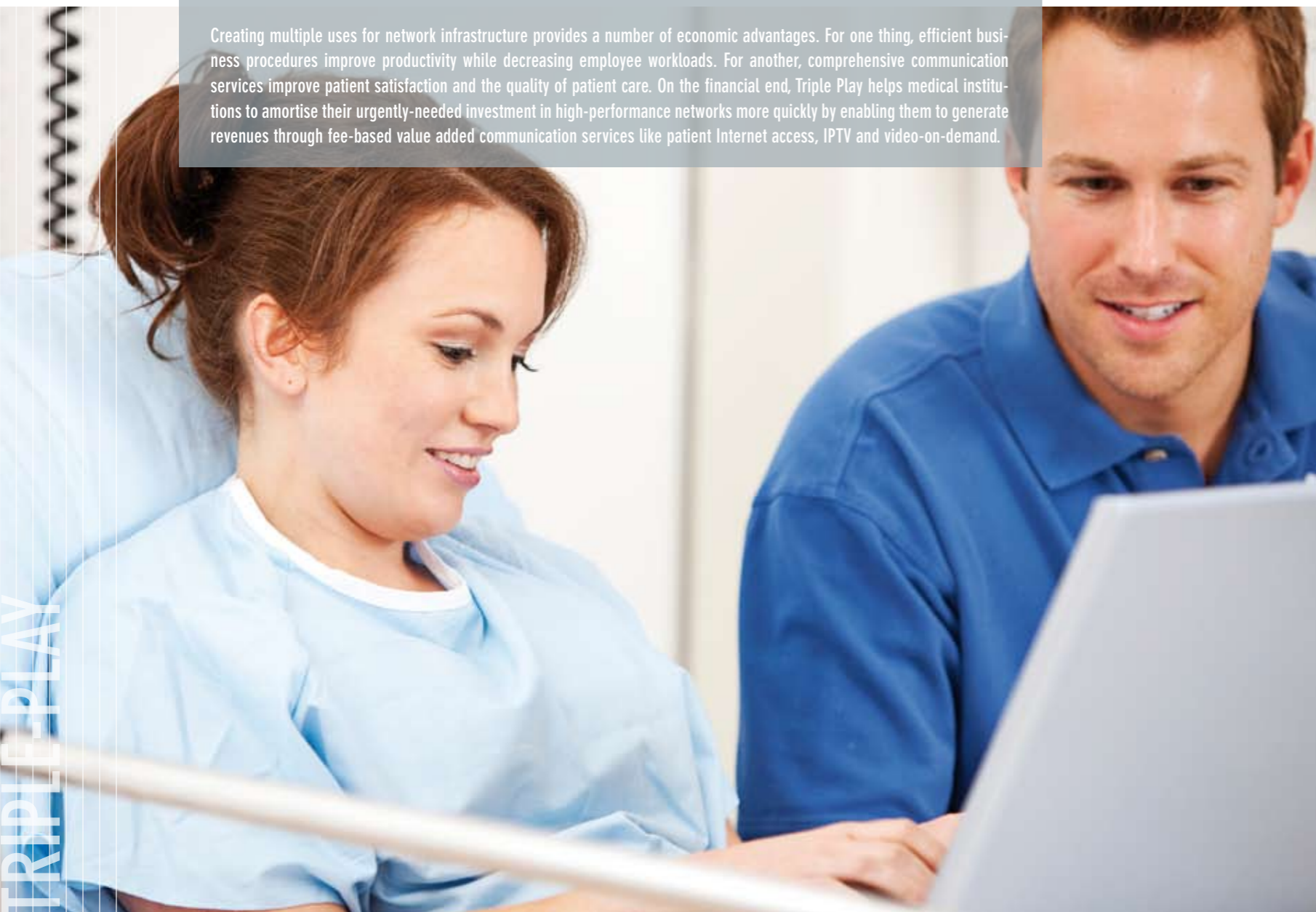


Do you have any questions about our FTTO products? Just contact our expert consultant directly:
Mr. Dirk Herppich | Technical Consultant | Tel. +49 2381 9452-139 | healthcare@microsens.com

Triple play lucrative services as a route to increased profitability in hospital IT-investment planning

Fast amortisation through revenues from fee-based services

Creating multiple uses for network infrastructure provides a number of economic advantages. For one thing, efficient business procedures improve productivity while decreasing employee workloads. For another, comprehensive communication services improve patient satisfaction and the quality of patient care. On the financial end, Triple Play helps medical institutions to amortise their urgently-needed investment in high-performance networks more quickly by enabling them to generate revenues through fee-based value added communication services like patient Internet access, IPTV and video-on-demand.



Extending fiber optic networks into tertiary areas results in a cabling infrastructure with greater overall reliability. It provides greater protection against electromagnetic disruption through electrical isolation, thus improving the availability of health care management IT-applications.

Reduce costs without sacrificing quality of care

For many clinic managers, cost reduction is the preferred method of ensuring a medical organisation's long-term competitive advantage. Since reduced rates of reimbursement limit opportunities for revenue generation, increasing patient numbers can only successfully improve the clinic's financial situation if combined with significant improvements to procedural efficiency. Otherwise, staff end up overworked and patient care quality suffers.

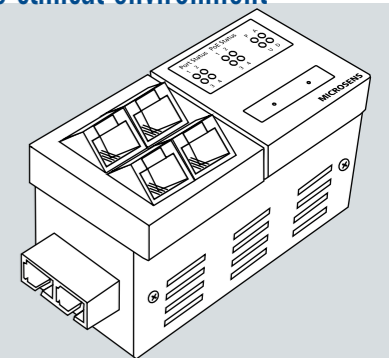
Long-term cost reduction by networking all business levels

A comprehensive network linking all levels of the health care management business, and thus providing long-term reduction of operational costs, is only possible with the help of the latest technology. MICROSENS' FTTO components lay the groundwork for the powerful "Triple-Play" networking concept. In this system, a variety of different data types are transmitted over the network simultaneously: internal data from the hospital information system, VoIP telephony, and value-added services for patients such as Internet or IPTV.

Flexible applications for triple play throughout the entire clinical environment

MICROSENS FTTO Switches provide a broad spectrum of integration and mounting possibilities which are perfectly tailored to medical institutions' needs.

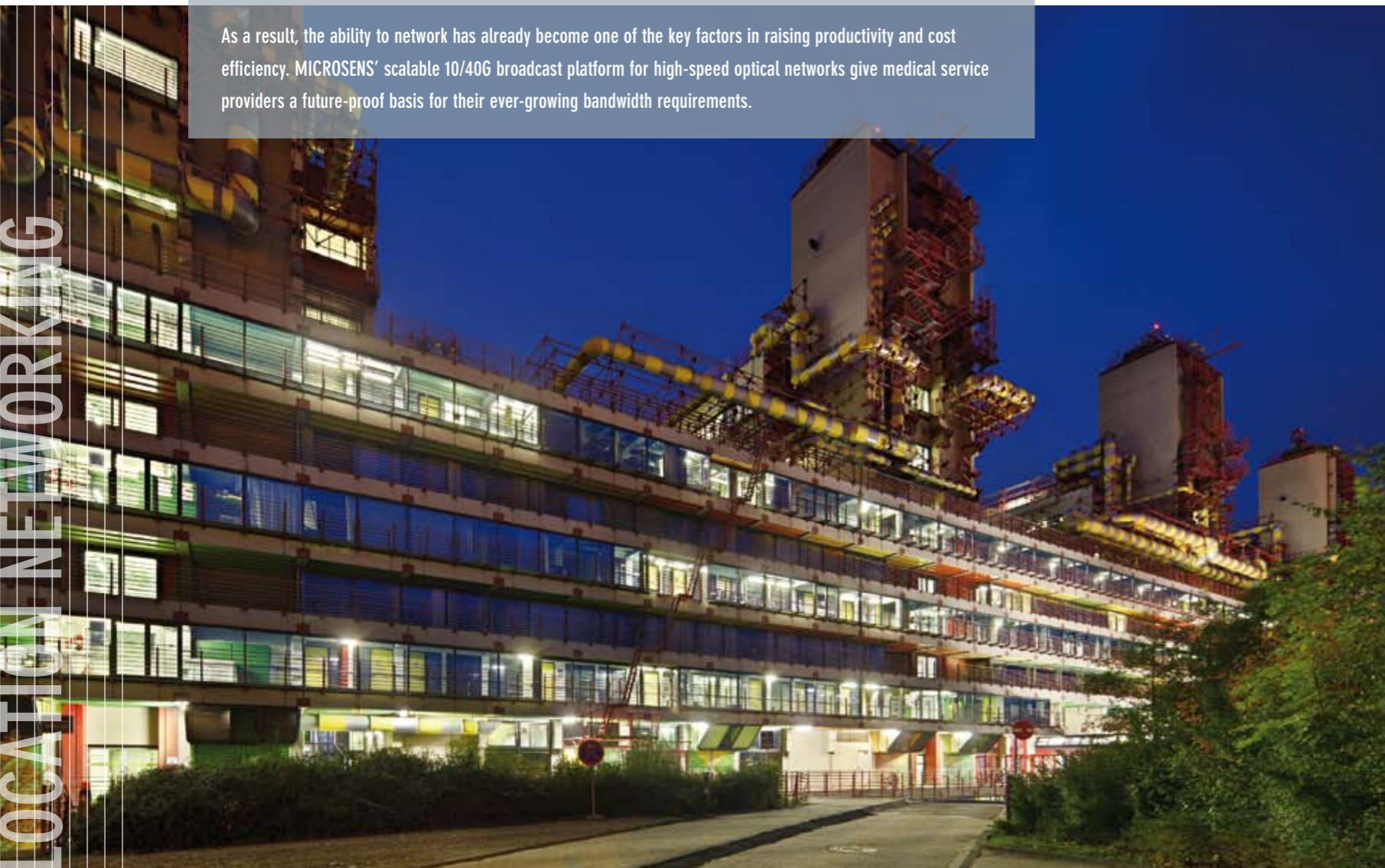
- Applications in patient care, operating theatre, and administrative areas
- Direct integration into ceiling-mounted units
- Integration of IP-based call systems
- Suitable for IP-based patient monitoring systems



Future-proof location networking as a competitive factor for medical service providers

Increasing amounts of interdisciplinary collaboration, closer ties between clinics and regional competency centers, and the new paradigm of integrated medical care are all designed to improve the quality of patient care. At the same time, however, they create significantly stiffer competition in the industry.

As a result, the ability to network has already become one of the key factors in raising productivity and cost efficiency. MICROSENS' scalable 10/40G broadcast platform for high-speed optical networks give medical service providers a future-proof basis for their ever-growing bandwidth requirements.



In times of limited funding and shrinking subsidies, clinic managers and technical directors demand future-proof investments. Procurement costs need to be proportional to actual bandwidth needs. Future requirements need to remain economically foreseeable.

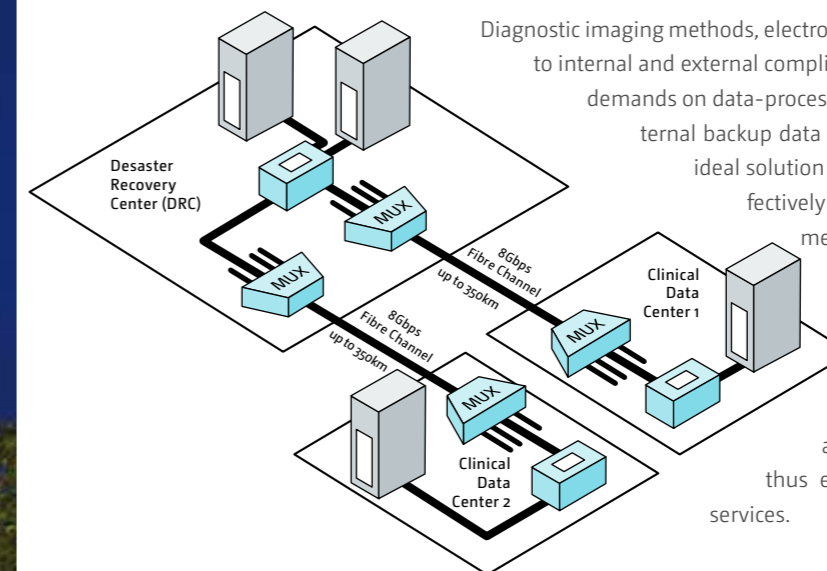
Cost-efficient usage of fiber optic capacities

The optical multiplex method gives clinic operators a cost-efficient way of multiplying their existing fiber optic networks' capacities. Parallel transmission of multiple wavelengths over one optical fiber enables transmission rates of up to several hundred gigabits per second (Gbps) with no need to lay any additional cables. If no fiber optic network is currently in place, dark fiber cables can be hired inexpensively and used economically.

Pay-as-you-grow: low initial investments, low operational costs, scalable at any time

The "pay-as-you-grow" idea has long been a prevalent investment planning principle among telecommunications providers, and today it is equally applicable to networks linking clinic locations, cooperation partners, and medical care centers. The modular design of the MICROSENS Optical Transport Platform enables optimal reconciliation between investment costs and networking needs. Should necessary bandwidth increase or additional services be required, additional modules can simply be added on. In addition, energy-efficient system design ensures low operational costs for electricity and cooling.

Data processing center connections for clinics and hospitals

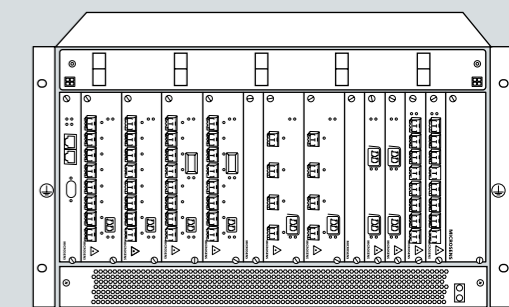


Diagnostic imaging methods, electronic patient files, and stricter guidelines due to internal and external compliance standards all result in ever increasing demands on data-processing center security systems. Linking to external backup data processing center has turned out to be an ideal solution for the medical world, and it also most effectively addresses the challenges of risk management after geo-redundancy. The MICROSENS Optical Transport Platform's high level of transport performances makes it possible to connect external computing centers redundantly through multiple dedicated channels at bandwidths of 10/40 Gbps per channel, thus ensuring reliable transmission of various services.

MICROSENS Optical Transport Platform

Flexible, high-performing optical transmission system for the deployment of growing transmission capacities on CWDM, DWDM and SDH networks.

- High reliability, redundant construction, scalability
- Protocol transparency (Fibre Channel, Ethernet, SDH)
- Energy-efficient design
- CWDM/DWDM systems (also in asynchronous balanced mode) for bandwidths of 100 Mbps–10/40 Gbps and up to 160 separate channels



Reliable Industrial Ethernet solutions

for facility management and surveillance

Apart from economic considerations, what count most in health care management are reliability and security. This is especially true when it comes to the availability of building management systems and to the industrial Ethernet components used to connect supply systems. Since patient well-being is directly dependent upon climate control and power supplies, system failures in these areas are not acceptable. Meticulous manufacturing processes and utmost stringency in quality control allow MICROSENS industrial Ethernet components to help creating reliable networks of technical building systems in hospital environments.

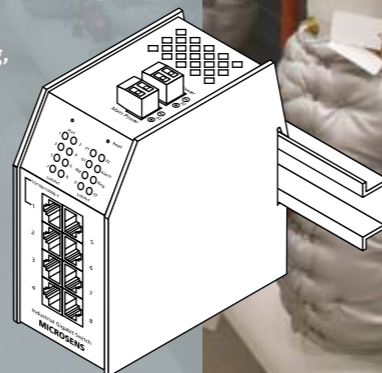
German-manufactured technical stability

Increasing needs for real-time data mean that network components are often used in rough conditions. IP-cameras, for example, are often used in outdoor areas to realise security monitoring of car parks and barrier systems. These types of applications require especially stringent development and manufacturing procedures. This is why MICROSENS develops and manufactures all of their Profi Line devices in Germany.

Central management and maximum reliability for sensitive medical areas

State-of-the-art manufacturing work and top-quality solid state technology make MICROSENS' industrial Ethernet components highly durable and temperature resistant.

- Ideal for IP-based central building management and control systems (heating, ventilation, air conditioning, light, intercoms, information and guidance systems, fire detection systems, access-control systems)
- Certified for use in power supply and distribution systems (IEC 61850-3 / IEEE 1613)
- Patented self-healing fiber optic ring topology guarantees maximum availability of critical applications
- High temperature resistance (operating temperatures ranging from -40 to +75 °C)
- Power-over-Ethernet, VLAN, QoS, IGMP snooping, STP/RSTP and central management (NMP)



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www.microsens.com/healthcare

MICROSENS

MICROSENS GmbH & Co. KG
Küferstr. 16
59067 Hamm / Germany
Tel. +49 2381/9452-0
Fax +49 2381/9452-100
info@microsens.com
www.microsens.com

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