

Nr. 1, July 2001



Dear Readers ,

The Internet boom of recent years, the deployment of applications with increasing bandwidth demand, and the development of new types of services, have all resulted in a dramatic development of telecommunication technologies.

The demand for reliable and fast transmission systems with high data throughput rates will increase still further. Fiber optic based communications technology will be a component of major importance in this development.

MICROSENS has made its mark in local area networks in recent years, and become a market leader in media conversion and concepts such as "Fiber to the Office".

We are currently investing considerable effort in the development of new solutions for Metro Networks and Enterprise Access. This field provides the greatest development potential as a result of the increasing convergence of local (LAN) and wide area networks (WAN).

This newsletter offers a new source of regular product information, with better and more up-to-date information, and with a focus on solutions.

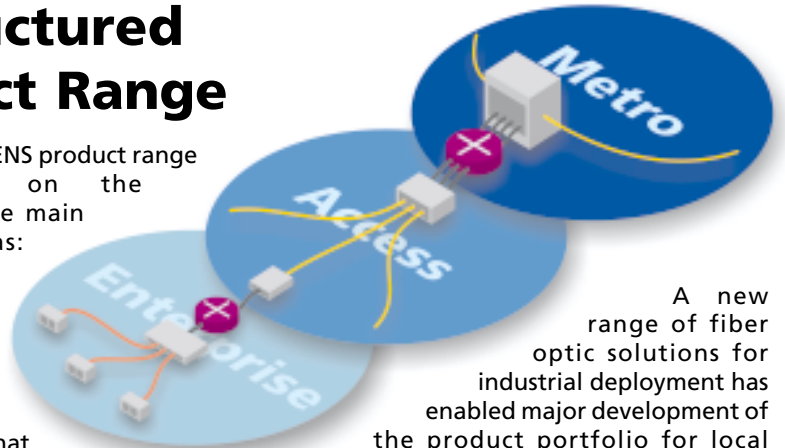
Our expert employees are always available to assist you in realising your applications.

Yours
Thomas Kwaterski
Marketing Director

Restructured Product Range

The MICROSENS product range concentrates on the following three main business areas: Enterprise Networks, Enterprise Access, and Metropolitan Networks.

This means that MICROSENS offers an end-to-end product range for fiber optic communications from optical network adapter to complex wavelength multiplexing systems for MAN deployment.



A new range of fiber optic solutions for industrial deployment has enabled major development of the product portfolio for local networks.

Further information can be found on page 7.

June, month of exhibitions

The month June has had a very high participation on exhibitions. MICROSENS has exhibited on the following events:

Networld+Interop in Tokyo/Japan (06.-08.06.01), the CommunicAsia in Singapore (19.-22.06.01) and the Networks Telecom in Birmingham/U.K. (26.-28.06.01).



A review of the events in June and a preview on the upcoming events are on page 8.

MICROSENS awarded

On the occasion of the 15th trade fair "infosystem 2001" in Poznan/Poland, one of the most important events in the Polish IT industry calendar, MICROSENS received an award from the Polish Ministry for Education and Science for a joint presentation by Cisco, Alcatel, Ericsson Enterprise Systems and MICROSENS that focused on "New Generation Networks", part of the national Polish Fiber Optic Internet (PIONIER).

The presentation introduced the current fiber optic wavelength multiplexer systems for deployment in a Metropolitan Area Network (MAN).

MICROSENS provided 8-channel DWDM systems (Dense Wavelength Divi-

sion Multiplexer) and cost-efficient 4-channel CWDM systems (Coarse WDM) for the presentation.

Further information to the Metro solutions are on page 4.



Content

News	1
Enterprise Access, Modular converter systems	2
Metro WDM	4
Enterprise Networks, Fiber to the Office	6
Fiber solutions for industrial environments	7
Review exhibitions	8
Preview	8

Modular Access Platform



Today's network infrastructures require open systems based on fiber optics that can be installed easily, and adapted flexibly to changing requirements.

MICROSENS supplies modular converter systems with a multitude of functionality modules for LAN and WAN applications as well as for the conversion of telecommunications and industrial interfaces.

Chassis options

The modular converter systems from MICROSENS are based on universal card modules for installation in various chassis. The 3 HU version can house up to twelve modules.

Power supply comes from a modular mains adapter that can also be used as a redundant power supply. As an option, mains adapters with 48 V DC input are also available. The 1 HU version can house up to three modules.

In addition to the 19" versions, the

product range includes 19" and dual desktop

Converter modules

The product range of converter modules includes copper/fiber optic media converters for LANs and WANs. Single mode fibers enable direct links over distances of more than 100 km.

Protocol transparent converters enable the direct coupling of communications equipment such as switches, routers and bridges to long haul single mode networks.

Thanks to this transparency, these components are not tied to particular applications but can be coupled with a variety of applications such as Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI, ATM (OC-3/OC-12), ESCON® and Fibre Channel.

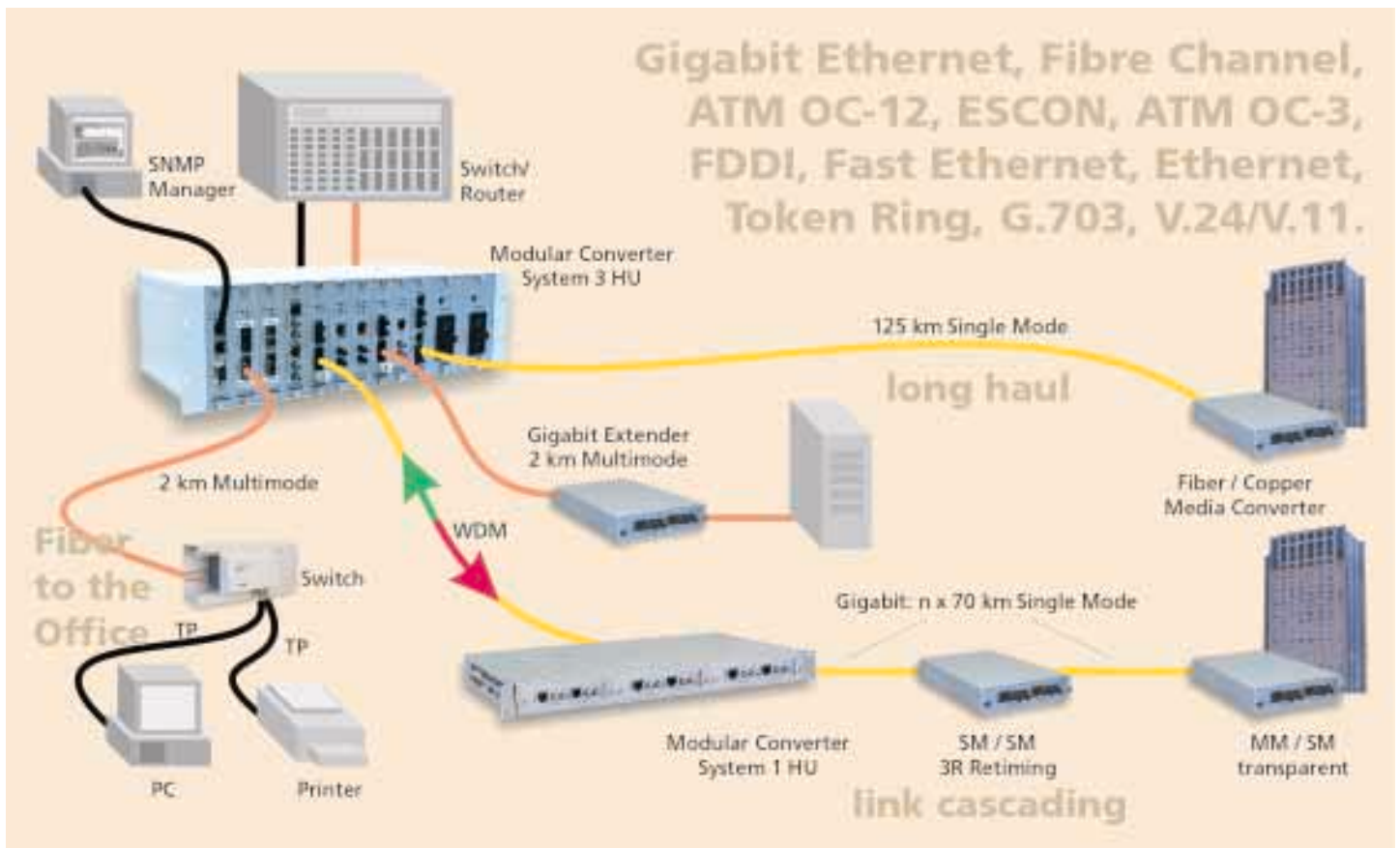
Wavelength Division Multiplexing (WDM) allows to double the number of channels in existing links.

All function modules can be combined at random and exchanged during operation (Hot Swap).

A wide range of products is available to allow selection of the optimum solution for current and future solutions for all bandwidth, fiber optic parameters, and connectivity demands.

Advantages Access Platform

- economic efficiency
- system modularity
- big choice of converter modules
- open system for future applications



SNMP/web based Management

Professional access systems enable integration of an SNMP agent, thus allowing effective monitoring of components via the connected network.

In addition, an integrated web server provides viewing by means of Internet browsers.

Future firmware updates can be carried out during operation via FTP upload. Remote queries to the console can be made via Telnet.

The system management can evaluate current operating parameters such as link status, product code and serial number, power supply capacity, fan status and module temperature.

Further information at:
www.microsens.com/uk/produkty/rck_snmp.htm



3R Converter

The deployment of converters with retiming functionality enables the implementation of far longer transmission distances, in particular for data volumes in the gigabit range, and allows cascading several long-distance converters with sub-segment lengths of up to 70 km (43.5 miles) each.

3R converters can also be deployed wherever poor signal quality requires complete regeneration. This applies to both long-distance single mode connections,



and local multimode lines. This solution enables the operation of gigabit multimode lines beyond 550 metres (1800 feet).

The process of complete signal regeneration is usually called '3R' (re-amplification, reshaping, retiming) and regenerates the amplitude, the curvature, and the timing of the transmitted signal.

Further information at:

www.microsens.com/uk/produkty/rck_3R.htm

Gigabit Extender

Many existing backbone connections are based on multimode fiber optics. Using standards such as Fast Ethernet, FDDI, or ATM enables transmission distances of up to 2 kilometres (1.24 miles) between individual switches and nodes.

The adverse features of multimode fiber optics due to intramodal distortion significantly reduce their deployment in particular for high data throughput in the gigabit range.

Despite of this MICROSENS offers a Gigabit Extender enabling the full use of existing multimode backbone structures



for gigabit bandwidths. The system can be used for the transmission of gigabit applications on existing multimode lines over

distances of up to 2 kilometres.

Further information at:
www.microsens.com/uk/produkty/rck_ext.htm

GSM Modem

The modular access platform also provides the connection of a mobile phone modem to the Management Agent, enabling access to the device from an external management platform. This wireless connection enables easy and simple installation at any location covered by a GSM network, without any additional effort.

Remote monitoring of the Access Platform via GSM offers additional benefits in comparison with the standard In-Band Management via Ethernet.

With In-Band Management (especially with long distance connections) the management information is transmitted together with the service signal via the same fiber optic line. If the fiber optic line is faulty, then the management data signal is also affected, which means that the main function of the management system - reporting and analysis of error conditions - is inhibited.

The GSM connection, on the other hand, enables uninterrupted access to

the devices to be monitored even if the service data line is down, and in this way it can significantly increase analysis accuracy in case of failures and accelerate remedial action.

Another major advantage of monitoring via GSM is the complete physical separation of data network and management.

Technically, the management has no influence on, and access to, the service data transmitted via the system. This means that the service data rate remains unchanged during management access, and there is no security risk created for sensitive data.



CWDM Platform 1.25 Gbps/channel



Increasing bandwidth demand, due to increased data throughput, inevitably results in an expansion of backbone capacities. One option would be the installation of new fiber optic lines, which would require much planning effort, various approvals, and costs. A faster and more cost-effective solution is the more efficient utilisation of existing fiber optic lines, using active multiplexing technology from MICROSENS.

Application fields

The WDM systems from MICROSENS enable telecommunication providers, ISPs, operators of metro networks, and companies with wide-spread networks, to expand the capacity of their existing fiber optic lines without delay and, most importantly, at much lower costs.

These systems allow operators to optimise the use of dark fiber routes at their own discretion. The deployment of MICROSENS WDM technology can be used for flexible and fast adaptation of

the backbone's active capacity to current requirements. This means that capacity shifts can be carried out swiftly by network reconfiguration.

The high data throughput rates of individual channels enable the transmission of services such as ATM OC-12, Gigabit Fibre Channel and Gigabit Ethernet.

Coarse WDM

The CWDM-based system operates within the optical window at 1550 nm, with a channel spacing of 20 nm. The system allows data throughput rates of up to 10 Gbit/s (1.25 Gbit/s per channel and direction).

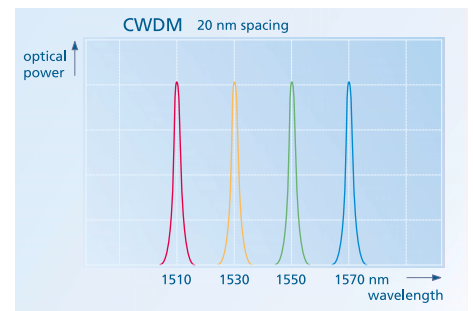
Connection to the single mode network is made via the line interface over transmission distances of 50 km or 70 km respectively.

Two access interfaces - ports with 850 nm multimode or 1300 nm single mode - are available.

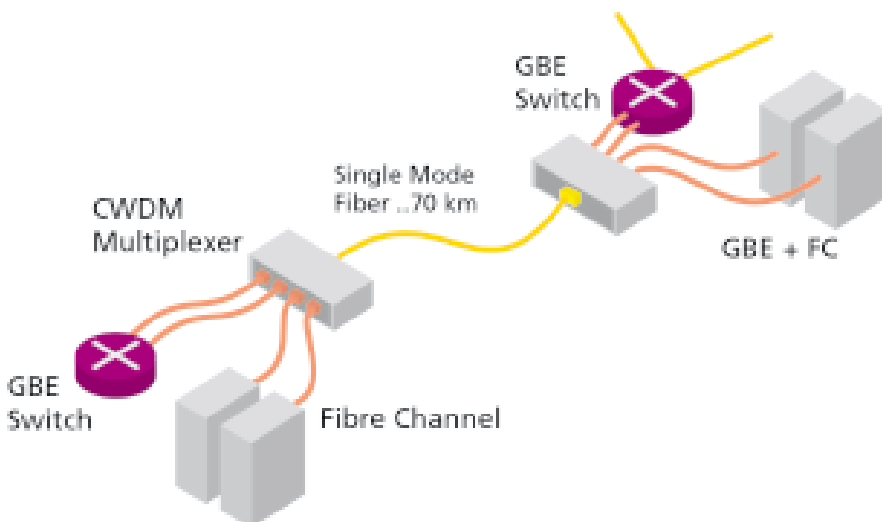
The WDM system is equipped with a slot for the (optionally available) integration of SNMP/web based management. The internal power supply can also be protected by a RPSU system (Redundant Power Supply Unit).

4 and 8 channels

With the MICROSENS WDM systems it is possible to transmit four, or with the extended version, up to eight independent high speed services over one single mode line.



The use of the WDM technology offers an efficient solution to expand the capacity of existing fiber connections, without changing the infrastructure.



Advantages CWDM Metro platform

- Use of laser technology of the latest generation
- compact design
- full integrated optical subsystem
- stable optical parameters
- easy installation and maintenance
- graduated product range
- future products like Add/Drop multiplexers in development

Further information at:
www.microsens.com/metro/

Metro DWDM Platform

Dense Wavelength Multiplexing

Today's transport networks are facing a dramatic exhaustion of capacity with rapidly increasing demands on bandwidth.

The liberalization of telecommunication markets allows competition between carriers at metro level.

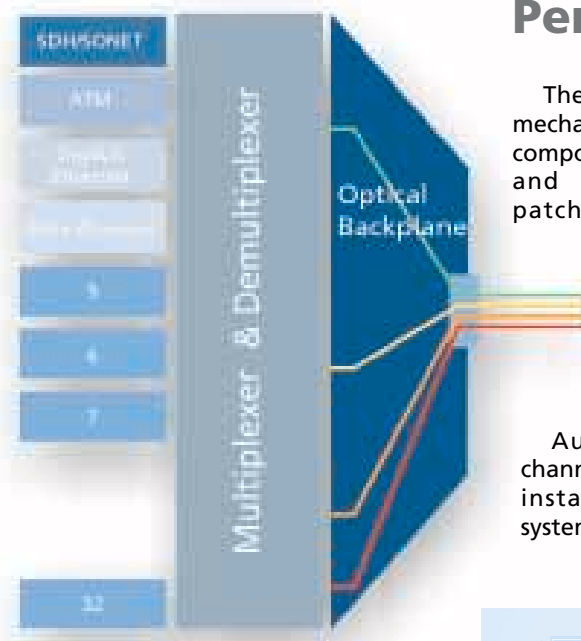
Metropolitan Area Networks offering high speed access are one of the fastest growing markets today.

New services like 3G mobile phones, MP3, Voice over IP, and Video on Demand push end user bandwidth needs far beyond existing limits.

New concepts like Fiber To The Curb/ Fiber To The Home are starting to provide high capacities for end users.

Competitive carriers are searching for flexible and cost-effective solutions to meet these demands at transport level today and in the future.

The parallel transmission of multiple channels on a single fiber using different wavelengths for each channel offers a nearly unlimited increase in transmission capacity for fiber optic networks.



Performance

The integrated optical backplane mechanically protects passive optical components and facilitates operation and maintenance. No external patching is required for module insertion and removal.

The status of each interface can be monitored by a central management module. An alarm notification is generated in case of component failure.

Automatic optical path and channel protection can optionally be installed for maximum fail-safe systems.

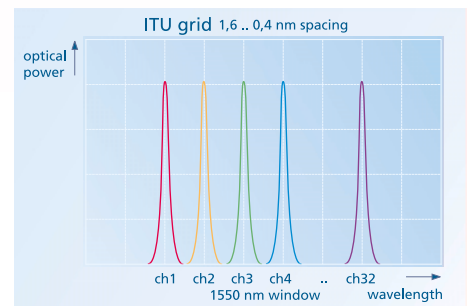
High Flexibility

To ensure the highest flexibility and economical effectiveness, the capacity of DWDM systems must be designed to grow together with bandwidth demands.

A modular approach at channel level gives the flexibility to add transmission channels to increase capacity on demand.

Metro networks require flexible network structures from point-to-point to meshed ring topologies.

Optical Add/Drop Multiplexers (OADMs) can be integrated into the chassis to build ring/meshed ring structures.



Advantages DWDM Metro Platform

- optical backplane, no external patching necessary
- complete modular design
- scalability of the system
- easy installation and maintenance
- Add/Drop multiplexers

Further information at:
www.micosens.com/metro/

Fiber to the Office



Fiber at the core of the building

In today's demanding multimedia workplace, your network needs to deliver more bandwidth and greater performance than ever before. Our range of building installation products uses an intelligent combination of fiber optic and twisted pair cable technology to deliver that performance and ensure the long term security of your investment.

By using the extended distance capabilities of fiber optic cabling you can centralise the distribution of your network in a single location. This concept is called "collapsed backbone".



Collapsed Backbone

With this concept, fiber optic technology is already present at the office level as the one and only future-proof medium.

Special hubs and switches, for cable trunk or underfloor mounting, ensure active media conversion at the workplace, enabling the connection of end devices via common twisted pair cables.

End devices, such as PCs or printers, can be equipped with inexpensive 10/100Mbit copper network cards. Any network expansions or updates only require alterations at the end-user level.

The Fiber to the Office concept from MICROSENS offers the following substantial performance benefits:

Performance

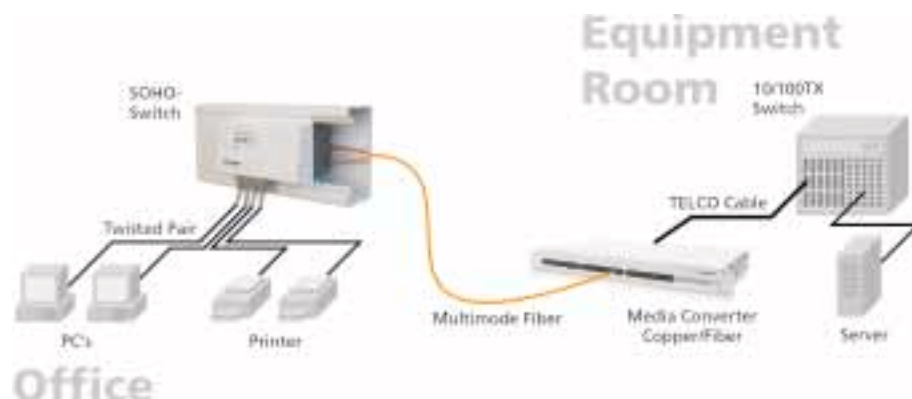
- Spare capacity is available within the fiber optic cabling for future high speed applications.
- Intelligent load sharing within the network by using distributed switch technology.
- 10/100 Mbit/s autonegotiation means you decide when to upgrade a user to the next technology.
- Improved network efficiency from collapsed backbone architecture.

This well-established fiber optic wiring concept right through to the workplace offers substantial cost benefits:

Economic efficiency

- Extension of the lifetime of your existing network equipment by using copper / fiber conversion technology.
- Reduction of the number of expensive active ports in your central switch.
- Reduced price per port using high density multiport copper / fiber converters at the central location.
- Saving of space and money without additional floor distribution or bulky copper cabling.
- Reduced administration and maintenance costs.

Further information at:
www.microsens.com/uk/ftto.htm



Industrial Fiber Optic Ethernet

Ethernet as a fieldbus

Ethernet is increasingly replacing traditional field bus systems in industrial environments. The significant advantages offered by Ethernet networks are a major driving force for their rapid spread.

Ethernet is an international standard that has been proven in millions of applications worldwide, ensuring the compatibility of components from various vendors.

Standard Ethernet with 10Mbit/s already operates significantly faster than most field bus systems. Transition to Fast Ethernet (100 Mbit/s) and Gigabit Ethernet (1 Gbit/s) enables additional scaling of the data transmission rate.

Integration of the industrial network with the data network is easily carried out without protocol conversion.

Topology

Industrial Ethernet systems offer various different cabling options:

Point-to-Point

Each end terminal is star-connected to the central exchange, offering optimum protection against failure.

Redundant Ring

Special industrial switches enable ring connectivity of several terminals.

Because of the redundant design, the operation is not affected by a disruption of the ring.

Performance

Fiber optics is the ideal transmission medium in harsh environments such as heavy industries. In addition, fiber optics offer greatly improved performance in comparison with traditional copper cables.

Fiber optics can offer high data throughput over long distances. Once the network is installed it is available for future requirements and upgrades.

Transmission via fiber optics is completely immune to electromagnetic interference from machinery.



Galvanic Separation

The electric potential barrier between all connected equipment is ensured by the dielectric properties of fiber optics. Furthermore fiber optic cables can be installed along power cables without additional insulation.

In particular, future installations of fiber optic networks can be carried out without problem even in fully occupied cable conduits.

Security

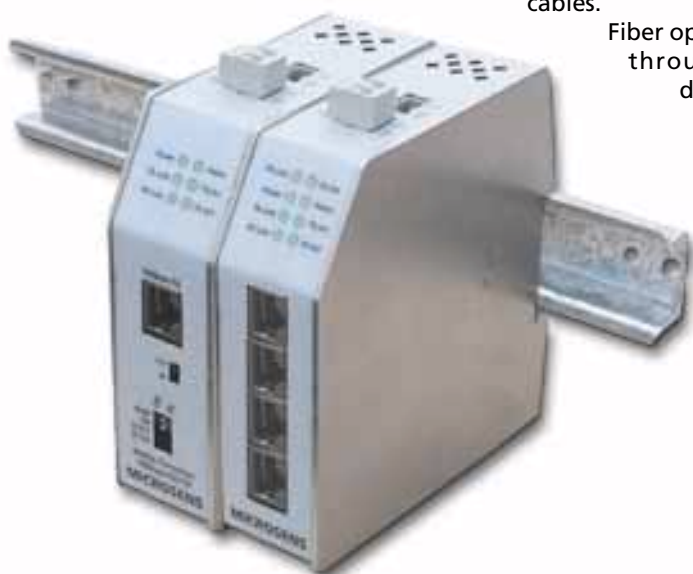
Existing fiber optic networks can be upgraded in the future to the latest technologies without replacing cabling.

Absolute immunity of fiber optic cables against electromagnetic interference ensures fail-safe operation even under changing operating conditions, eliminating time consuming fault finding and maintenance.

Redundant ring structures enable fail-safe operation even when connections are interrupted.

Advantages industrial components

- fail safety
- immunity, galvanic isolation
- robust design, full metal chassis
- fast putting into operation
- easy installation on 35 mm DIN rails



Further information at:
www.microsens.com/industry/

June, month of international exhibitions

Network+Interop, Tokyo

For the third time MICROSENS has exhibited at N+I in Tokyo (the largest Japanese IT event), held this year from 6 to 8 June. Besides winning new customers and projects the company focused on the

**NETWORLD
+ INTEROP
2001 TOKYO**

maintenance and consolidation of existing customer relations.

This trade fair was a major success in both areas. Visitors responded very positively, and a number of promising new projects are under consideration. Existing partnerships were also reinforced and developed.

CommunicAsia, Singapore

Singapore hosted CommunicAsia 2001 from 19 to 22 June. Exhibitors presented their latest products for the telecommunications markets in six halls. We have been serving the Asia-Pacific region with increasing success through our branch office in Singapore. However, this event in the "Lion City" of Singapore is of importance beyond the local region. A large number of our visitors came from countries such as Malaysia, Thailand,

CommunicAsia2001
The 11th Asian International Communications and Information Technology Exhibition & Conference

Indonesia and India. MICROSENS was able to expand its distribution network in this region through new partnerships. We look forward to the in-depth development of these new contacts.

Networks Telecom, Birmingham

This year's Networks Telecom in Birmingham, Britain's largest IT trade fair, was characterised by the depressed technology market. In comparison with previous years the numbers of exhibitors and visitors had decreased. Many large corporations, such as Cisco for example,

Networks telecom
2001
16-18 June 2001, NEC Birmingham
www.networks-telecom.com

were not represented by their own stand. However, for MICROSENS the event was a success because of the many interesting contacts made, especially with regard to access networks.



Conference Metropolitan Optical Networks, Paris

This annual international IT Conference will again take place in Paris from 12 to 14 September 2001, and will be staged in co-operation with MICROSENS. The previous title of "Transport Networks Forum" has been changed as a result of the new trends in telecommunication markets.

Our Technical Director, Hannes Bauer, will present solutions for high-speed access networks with special emphasis on the coupling of Gigabit Ethernet backbones via SDH networks. Due to ever increasing convergence between LAN and WAN systems, this technology will play a key role for the development of high-performance and cost-effective infrastructures.

Latest infos about exhibitions and events at:

www.microsens.com/uk/messen_2001.htm

New event in August: Telecom Thai, Bangkok

We have placed a last-minute booking for yet another trade fair. From 2 to 5 August MICROSENS will exhibit at Telecom Thai 2001, in Bangkok. Thailand is one of the major customers for telecommunications equipment in Indochina. The organisers aim to establish an improved technology exchange in these times of increasingly globalised IT markets.

THAILAND'S OFFICIAL TELECOMMUNICATION TRADE EVENT
Telecom Thai 2001

At Telecom Thai, MICROSENS will present its fiber optic solutions to a professional audience. Through close co-operation with our partner Optical Fiber Products (Thailand) we will build a good foundation for our local presence. We look forward to welcoming you at the Queen Sirikit National Convention Center in Bangkok, stand B11.

Editorial

Responsible for the contents:

Dr. Hocine Bezzaoui, President
Thomas Kwaterski, Marketing Director
(c) MICROSENS GmbH & Co. KG
Kueferstr. 16, D-59067 Hamm / Germany
Tel.: +49(0)2381/9452-0, Fax +49(0)2381/9452-100