MICROSENS
fiber optic solutions

Dear Readers, Dear Partners,

No area of life changes as fast as communication. While only a few years ago we were still overwhelmed by ISDN Internet access speed, today we call it a "Stone Age technology". The new buzzwords, promising unlimited bandwidth, are ADSL, UMTS, wireless LAN and "Fiber To The Home".

All these systems are access technologies and represent the "last mile" on the information path to the end user. Users are usually unaware of the technology on the higher levels.

Today, data can be transmitted fast enough only through fiber optic connections with data stream multiplexing. Current telecommunication networks are optimized for voice switching and connections, and are unable to respond in a cost-effective way to the requirements of broadband access.

The emerging new, cost-effective technologies influence the spread of wide area networks. MICROSENS offers an attractive portfolio of access and metropolitan network products for those fast-changing markets. You may read about our newest solutions in this issue of MICROSENS' Newsletter.

Hannes Bauer
Technical Director

Contents

exponet 2001

From 20-22nd November the most important autumn IT event took place in Cologne. Regardless of the difficult situation of the IT industry, MICROSENS presented a wide range of new fiber optic solutions.

In this second issue you will find the most important new developments in addition to the existing company's product range.

Our growth continues

Despite the negative trend dominating the whole industry, MICROSENS is presently experiencing fast growth. At a time when leading IT companies face rapid decrease of order volume and are forced to reduce the number of their stuff, MICROSENS is expanding its sales team.

Due to its effective sales operations, the company has completed many large projects. At the end of October, the number of orders grew by 40%, compared to the same period of last year.

Other interesting company information can be found on page 2.

Enlargement of international sales network

MICROSENS has been operating internationally for many years. Representative offices are located in France, Poland and Singapore. In addition, our products are sold in many countries by a wide network of distributors and partners.

Thanks to the new strategic partnership with the Brazilian company AGC Tecnologia Ltda., MICROSENS products are now available in South America.

We also signed a strategic partnership agreement with I.T. Co, one of the largest Russian network integrators.

MICROSENS is now also operating in the Czech Republic, cooperating with a new partner, Atlantis Datacom. The company focusses on network and communication products. The official partnership agreement was signed at this year's IT fair Invex in Bern (15.10 - 19.10).

The new Brazilian partner (right to left): Mr. Cirkoski (Managing Director, AGC Tecnologia Ltda., Brazil), Mrs. Pajot (Marketing Manager, MICROSENS), Mr. Kwaterski (Marketing Director, MICROSENS).

MICROSENS continues to grow rapidly

MICROSENS has been growing continuously since its foundation in 1993. While undertaking implementation of IT and telecommunication projects, leading companies prefer to rely on a trustworthy brand and the MICROSENS brand name has become a synonym of competence in fiber optic solutions.

The IT industry is under strong pressure, particularly this year. As the financial year comes to an end and the results of many companies still remain much below the forecasts, the market competition becomes more and more severe.

Despite the negative trend dominating the whole industry, at the end of October the number of orders accepted by MICROSENS grew by 40% compared to the same period of last year.

MICROSENS is not only expanding in Germany, but is also more and more present abroad. As a manufacturer of internationally recognized systems, MICROSENS sells its solutions throughout the world. The company has its headquarters in Hamm (Westphalia, Germany) with offices in France, Poland, and Singapore.

In autumn this year, MICROSENS reached strategic partnership agreements with foreign companies as AGC Tecnologia (Brazil), I.T. Co. (Russia) and Atlantis Datacom (Czech Republic).

I.T. Co is one of the largest Russian integrators, distributor and software developer. It has a long experience in designing and deploying LAN and WAN networks based on high-quality components. The company, established in

1990, is today among the largest integrators in Russia. It employs more than 600 people, and - apart from the headquarters in Moscow - has offices in St. Petersburg, Ufa, Kazan, Wolgograd, Irkuck and Krasnojarsk. Furthermore, I.T. Co cooperates with 200 Russian and other former Soviet Union dealers.

At this year's international IT fair INVEX in Bern, the partnership between MICROSENS and the leading Czech distributor Atlantis Datacom was announced. The company with headquarters in Prague specialized in communication and data processing. By means of its wide range of products, it offers end-to-end IT solutions for medium and large companies.

As a result of AGC Tecnologia's president Goran Cirkoski's efforts, a partnership agreement was signed. It took very short time to create a promising sales structure of MICROSENS products in South America. AGC Tecnologia extensively cooperates not only with major copper and fiber optic cable suppliers, but also with the largest telecoms in Brazil.

MICROSENS is a worldwide registered trademark

MICROSENS's brand name has been associated in Germany and other countries with high-quality active fiber optic systems for a long time. Today, many leading companies on the telecommunication and network markets trust in our brand.

To maintain this reputable position, we have registered MICROSENS's brand name throughout the world. The brand registration is a basis for further expansion of our company on the global growth.

After having our trademark successfully registered on the most important European markets, we have registered it on other continents, including such important countries as Japan, Singapore, Hong Kong, the United States, Canada, Australia, and South-American countries. This quality seal ensures us a unified appearance and strengthens the world wide cooperation with our partners.

The pictures show the documents confirming the trademark registration in Germany (left) and Japan (right).

Enterprise Networks

A future-proof solution: fiber optic networks

With today's pace of innovation and rapid development of communication technologies, an installed network becomes obsolete within two or three years. Therefore, the network designer has to ensure scalability and upgradeability. A quick solution is to upgrade active network components to solutions capable of using new technologies.

Network's lifetime

However, passive cabling cannot be changed often. The assumed lifetime of cabling systems is much longer, normally 10 - 15 years. Networks must still operate effectively long after installation. This is particularly true about passive cabling.

For an enterprise manager, installing an end-to-end fiber optic network results in a long-term investment protection in the world of fast-changing technologies.

Intelligent migration to fiber optic networks

A complete migration from existing networks to fiber optic is practically not feasible, and would usually be unreasonable. No customer wishes to abandon all of the installed equipment made to work with copper cables, such as central switches, PCs and print servers.

The best solution, especially for existing networks, is an intelligent mix of twisted pair and fiber optic cabling. By means of additional devices, such as media converters and workgroup switches with fiber optic uplinks, the migration becomes financially feasible and future-proof.

As a result of growing amounts of transmitted data and the development of technologies, a concept of modernizing existing networks is needed to transform the existing IT structures into future network solutions. The only future-ready solutions are based on fiber optic links. Such links should go as far as to the end users, or at least to the office area.

The "Fiber to the Office" solution and related workgroup switches, accompanied by the media conversion technology, enable an effective migration to fiber optic infrastructure. They allow integrating future-concept networks with the existing copper-cable equipment.

PC converter

One of the latest solutions for workpoint media conversion is a PC-integrated converter. It can be installed in a personal computer without any system modification, and then connected to a copper based network interface card through a short, external twisted pair cable (see picture below).

Due to this solution it is possible to continue using the existing network interface card (10/100Base-TX), or the onboard network controller. Such "smooth migration" does not require a complicated reconfiguration or reinstallation of network drivers. As the converter is powered by the PC's built-in adapter, no additional cables are required.

copper network interface card
connection cable
fiber
internal media converter
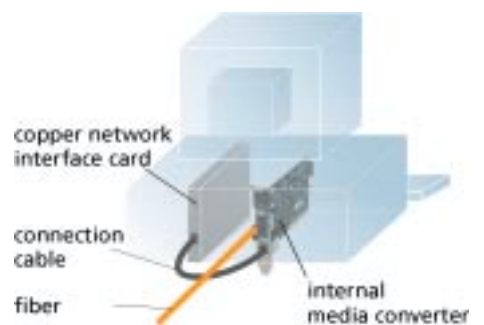
Further information can be found at http://www.microsens.com/uk/ produkte/pccard_fxtx.htm.

5-port mini switch fiber optic uplink

The advantage of copper 10/100 Mbit/s switches in office environment is the ability to connect both 10 Mbit/s and 100 Mbit/s devices. Therefore, end devices as print servers and old PCs with 10 Mbit/s cards can still be used.

Since the signal is distributed to several ports in a hub or switch, there is no need for fiber optic connection to each end device. Similarly, fewer optical ports are needed in the building's central switch, resulting in significant savings.

The Auto Crossing feature used in the twisted pair ports of the switch makes the difference between cross and straight-through cables completely transparent. The switch detects the type of pinout and acts appropriately. Therefore, both end devices and further switches can be connected by means of identical cables.

The device comes with braces for simple wall mounting.

Further information can be found at http://www.microsens.com/uk/ produkte/5p_switch.htm.

Fiber to the Office

Building's infrastructure based on fiber optic

The traditional concept of LANs based on copper cables is being surpassed by the newer fiber optic technology. Following the "Fiber to the Office" (FTTO) trend, fiber optic connections are being installed continuously from the building's central switch to the end devices. The unique fiber optic characteristics make all this possible without the need for secondary distribution level. Active conversion of fiber optic interfaces into copper ports takes place within the end area.

45x45 installation switch

MICROSENS's latest product development expands the wide product range of existing "Fiber to the Office" components by new models. The development efforts have been focused on providing ease of installation and compatibility with common installation systems.

The new model, based on 45x45 mm system, is one of the smallest active installation components available on the market. The 45x45 mm is a globally widespread size, making it possible to use the system also in foreign installation systems, such as Mosaic™ from Legrand®.

patent pending

German installation system providers are more and more often changing to this system, too. Its main advantage, compared to the existing systems, is a simplified (by up to 50%) installation. Instead of screwing, the components are simply snapped into frames and installation sockets.

Snap-In installation

The new product simplifies installation, especially in the under-floor area. Using the new Ackermann teliflur® GES floor mounting installation elements (see picture on the left), increases the capacity of connection sockets significantly. In addition to the installation switch, one triple connection box may contain other connection elements, too, e.g. FO exit box.

5 port switch

The IEEE 802.3u-compliant MICROSENS installation switch permits connecting of four end devices to a fiber optic network using 10Base-T or 100Base-TX network interface card and shielded twisted pair cable. The speed of data transmission in TX ports is automatically negotiated, which makes it possible to establish full-duplex links to end devices. In addition, manual configuration is possible. In this mode of operation, full-duplex connection via copper cables can be enforced. The 100Base-TX fiber optic uplink connection can be configured in full- or half-duplex mode by means of a switch.

Auto crossing

The Auto Crossing feature used in twisted pair ports of the switch makes the difference between crossed and standard cables transparent. The switch detects the type of cable and acts appropriately.

The switch is powered by a built-in adapter with 230 V input. Consequent use of power-saving elements and highly integrated design enables further energy savings. Maximum power consumption is 3 VA.

Further information can be found at http://www.microsens.com/uk/ ftto.htm.

24 port Fast Ethernet media converter

The latest converter generation is capable of providing media conversion of 24 Fast Ethernet ports on one height unit (1 HU) . These port densities are achieved not only with small form factor connectors (SFF) such as MT-RJ and VF-45, but also, for the first time, with the widely used ST and SC fibre optic connectors.

In addition to high port densities, the latest MICROSENS 24 port converters offer several additional features such as SNMP/web based management, redundant power supply, and AutoCrossing.

The MICROSENS converters are designed as 19 inch, 1 HU assemblies. The compact design of the converters enables high port densities within the switching cabinet.

Clustered plugs have to be deployed in many cases in order to achieve optimum utilisation of the port density in central switching components. These so-called TELCO cables connect 12 twisted-pair ports via one connection, and provide more flexible and simplified installations. The multiport converters provide suitable connectors and can be linked to matching switching systems.

Converters can be integrated into an existing SNMP management environment via an optional insertion

module. The standardised Management Information Base (MIB-2) ensures compatibility with commonly used network management platforms. The web-based management also enables visualisation by means of an Internet browser.

A special feature is provided by Management Stacking, which enables one management agent to monitor several multiport converters. The multiport converters to be monitored are interconnected with the management agent via a slave module and a standard RJ45 patch cable.

The converters also have a RPSU interface for connecting a redundant power supply unit (RPSU). This optional component provides an additional security for the power supply to the multiport converter systems. If the internal power supply fails, the external RPSU provides the entire power requirements.

Further information at :
www.microsens.com/uk/produkte/
mk24pfxtx.htm

"Fiber to the Office" in Central Department of Civil Defense

After the Federal Office for Civil Defense had been resolved on 31st December 2000, civil defense tasks were transferred to the Federal Office of Administration (Bundesverwaltungsamt - BVA) in Cologne. The tasks were taken over by the Department V - the Central Department of Civil Defense (Zentrallstelle für Zivilschutz - ZFZ) in Bonn. BVA, as the major executor of the Federal Government orders, is a superior power in the Internal Affairs Office with regard to business issues.

According to paragraph 4 of the civil defense act, ZFZ performs various tasks with regard to civil defense and disaster prevention. These include supporting the superior federal agencies in consistent planning of civil defense and in training staff responsible for preventing disaster consequences. Another task is to cooperate in the creation of a society alarming system.

The IT infrastructure and power infrastructure needed to perform these tasks used to be based on ineffective and non-upgradeable coaxial cabling and power system. There was an urgent requirement for modernizations.

On the basis of initial plans made by the IT team of the IB3 department in BVA (Bonn), Arxes Network Communication Consulting AG has been given the task of creating the construction plans.

As a result of construction and statistical requirements of the office buildings, a fiber optic network had to be deployed.

The solution was, of course, in many ways superior to copper cabling. In addition to fewer cables and holes, shorter cable lengths made it possible to reduce the number of sub distributions. Last but not least, fire hazard decreased.

After the building plans had been successfully completed, a tender for installing a modern IT network infrastructure was organized. The contract included upgrading the power network, and it was won by Röchling Technische Dienstleistungen GmbH & Co KG.

The upgraded links between users and servers were based on MICROSENS's "Fiber to the Office" concept. The concept was chosen due to its future-proof network solution, intelligently mixing copper and fiber optic cabling. A major advantage of this solution is a seamless integration with the existing installation environment. Active installation components in the cable channels mounted under window sills made user access points better.

MICROSENS installation switches are built directly into the channels running under window sills. Both the installation and operation are trouble-free. The network operates without problems, and gained full approval from the Central Department of Civil Defense cooperating with BVA. Another IT network is developed according to the same rules in a nearby Technical Support building (Technisches Hilfswerk - THW).

The project team (left to right): Jürgen Kunz (Project Manager, Arxes), Karlheinz Severin (Building Management, Röchling), Peter Prusinowski (Building Considerations, Röchling), Wilfried Koch (Operating Design, BVA), Marko Richter (Key Account Manager, MICROSENS).

Modular Access Platform

Modern network infrastructures require open fiber optic systems, which can be easily installed and flexibly adjusted to changing requirements.

MICROSENS's modular access platform is an open system based on many functional modules. It can be used in LAN and WAN networks, and for conversion of communication and industrial interfaces.

The system has been designed for fast and trouble-free integration of new technologies with the existing infrastructure. This guarantees maximum flexibility and investment protection. Various functional modules are responsible for e.g. media conversion, speed adaption, distance extension and wavelength conversion.

Further information can be found at http://microsens.com/access/.

Relay contact

In sensitive and complex applications, system status tracking is of major importance. Especially network operators and telecommunication providers, who use wide-area systems, need monitoring mechanisms. Using specific protocols such as ATM, SDH etc., makes it very difficult to employ standard network management applications like SNMP.

A much simpler monitoring mechanism is provided by voltage-free relay contacts. These contacts are built in a device and started when a fault occurs (e.g. when one of the links fails). This method of error detection has been successfully used by telecommunication providers for a long time.

Such a solution in communication industry systems makes it possible to switch off the faulty circuits. After the relay contact detected a fault, an automatic switching or reconfiguration of connections to redundant systems can be performed.

The signal is transmitted to other distribution points using existing two-wire connections, earlier used for transmitting voice and data. It is also possible to connect the relay contacts to rack monitoring devices.

MICROSENS uses this safety feature in transparent multimode/single mode 3R-type converters, and in CWDM systems. Relay contact can be configured as an opening or closing mechanism. This feature is offered as standard in CWDM devices, and optionally in rack-mounted modules with "R" letter at the end of the article number (e.g. MS416480MR).

Relay contacts are common in components available on the market. The ability to connect external alarm systems is required in the industry, too. Interferences are detected and signalled for example by an alarm LED.
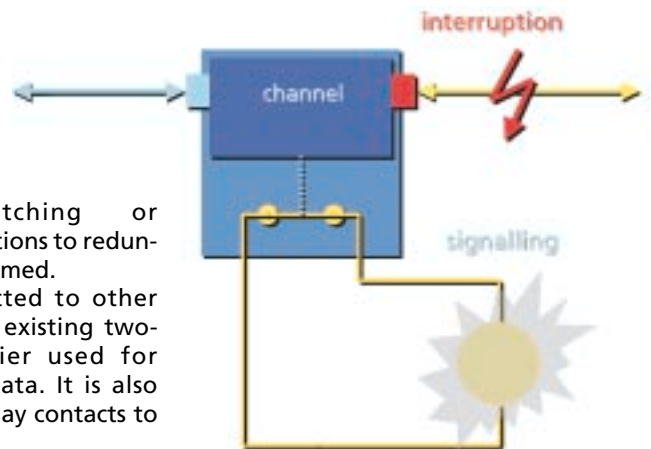
Several relay contacts can be configured to work as an logical OR element.
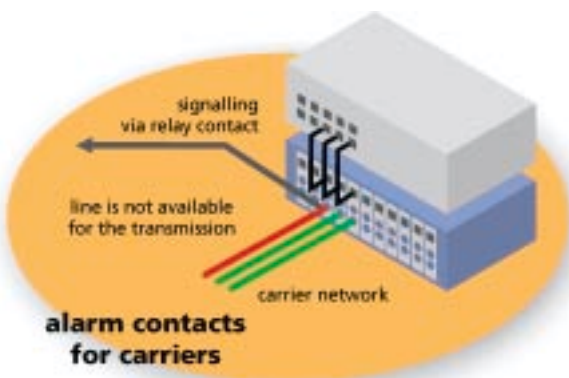
Fast Ethernet bridge

The integration of older equipment as well as existing Ethernet segments in modern fiber based Fast Ethernet networks is often a problem. The solution can be a bridge that offers not only media conversion, but also enables appropriate data rate adjustment. The bridge enables 10/100 Mbit/s autonegotiation and selection of half- and full duplex modes .

Therefore the close length restrictions of 5 km in Ethernet and 412 m in Fast Ethernet segment can be eliminated.

In addition to multimode versions, MICROSENS offers single mode devices with different optical parameters. They enable long distance segment connections from 15 km (standard version) up to 125 km (extended version).

Single mode bridges are essential for the use in Fiber To The Home (FTTH) projects. In these applications end users can take advantage of Internet services, Video on Demand and VoIP-applications through standard 10/100Base-TX copper interfaces.

While designing local fiber optic networks, Fast Ethernet connections are most often used. Mixing Ethernet and Fast Ethernet ports is avoided due to high costs. However there are components with 10 Mbit/s fiber ports (e.g. printers or terminals) that have to be connected to the network. For such applications MICROSENS offers optionally a fiber/fiber bridge (Ethernet 10Base-FL to Fast Ethernet 100Base-FX).

Further information can be found at www.microsens.com/uk/produkte/ rck_TXFXbridge.htm

Gigabit media converter 1000Base-TX/SX

The maximal network planning flexibility is offered to the users by the new MICROSENS Gigabit converter. Due to the use of this converter the number and the localization of Gigabit Ethernet fiber ports needed can be adjusted in an optimal way. Thus the existing connections between the edge and core area can be seamlessly migrated from Fast Ethernet to higher bandwidths.

Enhanced versions allow direct migration to single mode fiber optic connections (up to 70 kilometres).

Separate and expensive migration from SX to LX interfaces for "long distance" applications is no longer necessary. This technology is a premier solution especially for wide enterprise networks, as well as for campus and metropolitan area networks (MAN).

Due to an integrated Link Through function, the connection status of separate segments is transferred. Thus in case of connection breakdown it is possible to switch to redundant connections quickly.

The insertion modules of MICROSENS converters can be hot-swapped and allow the whole system to be reconfigured quickly .

Further information can be found at www.microsens.com/uk/produkte/ rck_gbe.htm
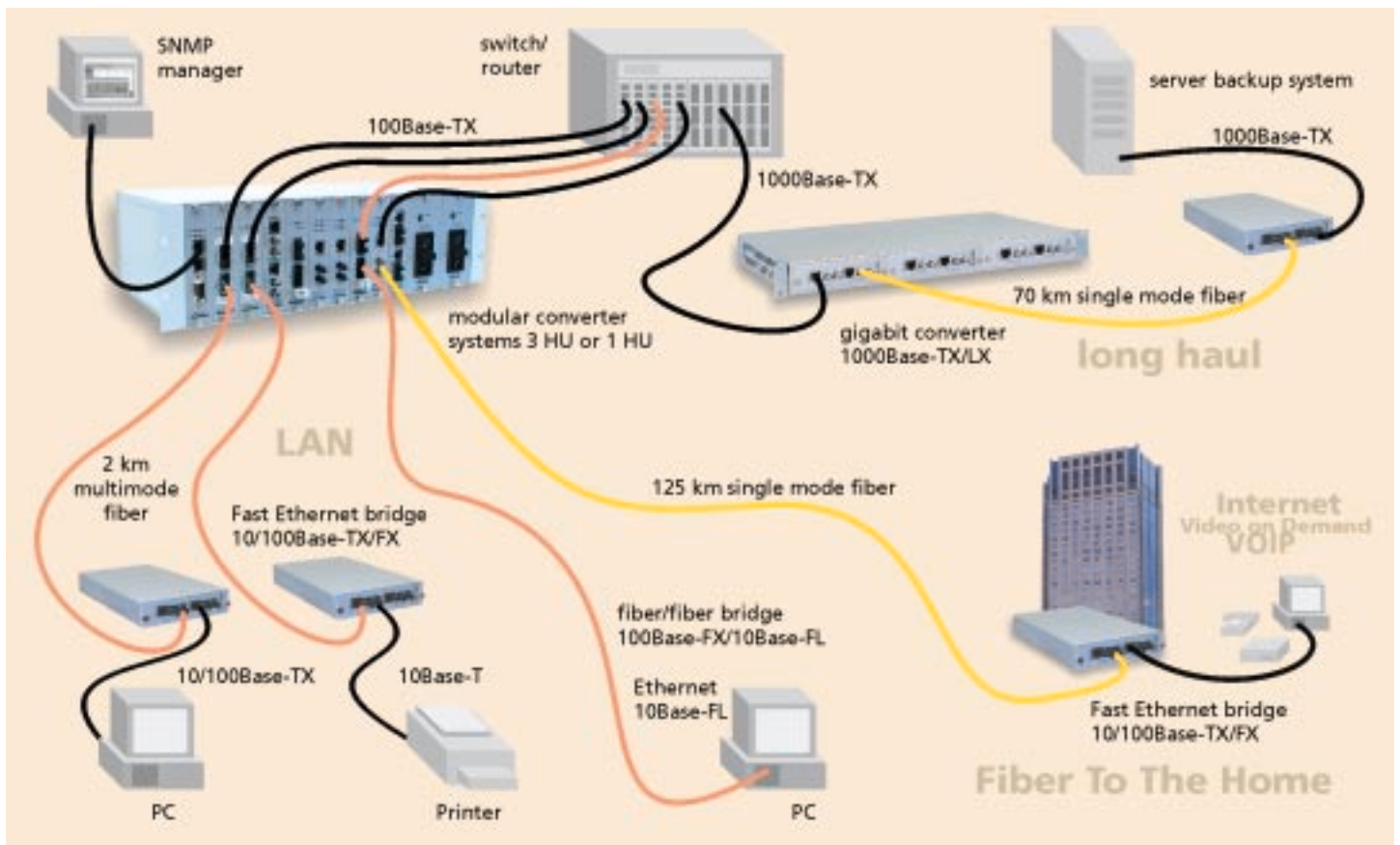
Long haul connections
with transparent converters

The rapid development of information technology leads more and more to a fusion of local (LAN) and wide area networks (WAN).

This LAN/WAN convergence requires new solutions for the interconnection of local enterprise networks, called Enterprise Access.

Especially for these applications MICROSENS has developed special protocol transparent media converters. These converters permit a cost effective conversion of local multimode ports to long distance single mode fiber.

Some of the supported protocols are Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI, ATM (OC-3/OC-12), ESCON® and Fibre Channel up to Gigabit speed.

The user can choose the right configuration out of a wide product range, adjusted to the demand for bandwith, optical parameters and connection technology for present and future applications.

Transparent MM/SM converters allow the connection of communication equipment such as switches, routers, bridges and PBXs over wide area single mode lines in LAN-, MAN- and WAN-areas. The default protocol transparency means, that the deployment of such components is not fixed but suitable for the coupling of various applications.

Converters available on the market only support 2R signal regeneration (reamplification, reshaping). MICROSENS complements this functionality by adding 'retiming' (3R) to its product range of multimode/single mode and single mode/single mode converters.

Further information can be found at www.microsens.com/access/
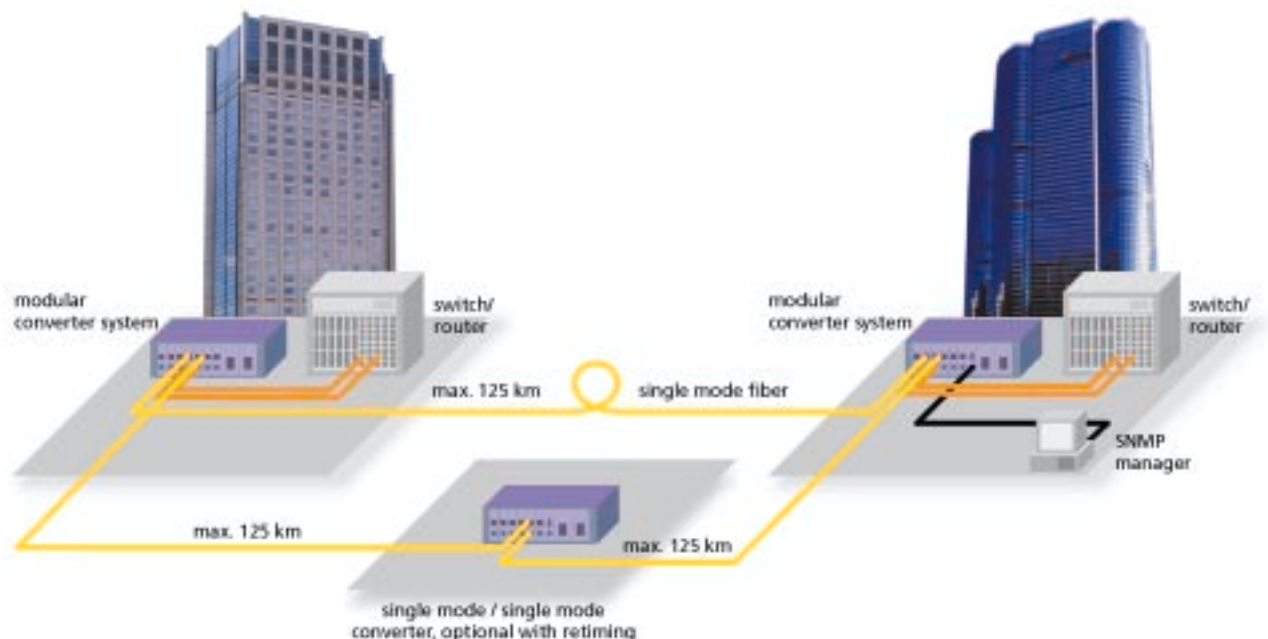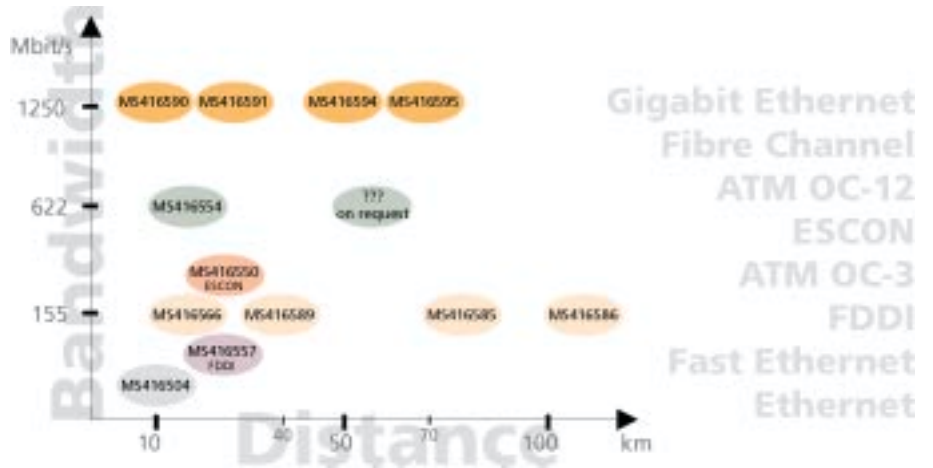
Successful launch of Gigabit Ethernet in WAN area

The Computing Centre of the Technical University of Silesia (Poland) successfully commissioned a 112 km Gigabit Ethernet fibre optic line. This end-to-end connection has been implemented utilising the latest optical gigabit converters provided by MICROSENS. The long-haul link was run via a dark-fibre

line provided by a telecom subsidiary of the Polish Rail (Zaklad Telekomunikacji PKP).

GBE in Backbone

The successful implementation of this connection is a practical trial of Gigabit Ethernet technology in the WAN range. The application incorporates the implementation of a wideband data link for computing intensive applications, and the implementation of distributed data backup.

"The solutions provided by MICROSENS worked well during the installation and test phases, and the continuous operation. Everything worked without any problems, and the Gigabit Ethernet connection is very stable," said Piotr Sasiedzki, Director of the Computing Centre at the Silesian Technical University in Gliwice.

Mr. Piotr Sasiedzki, Director of the Computing Centre at the Silesian Technical University in Gliwice.

The current backbone of the Polish scientific wideband network POL-34/155 works with ATM technology which has already been proven in fieldwork. However, scientists take it for granted

that they will be able to employ state-of-the-art technology, and pioneer implementation of the latest network technologies.

Gigabit Ethernet is a widely used and cost-effective technology offering sufficient bandwidth. In view of further developments of IP technology, and in particular the development of new flow control mechanisms (such as MPLS), the design of backbones based purely on Ethernet technology is only a matter of time. Ethernet technology is replacing current ATM connections with full flow control and quality of service - previously an argument in favour of ATM deployment.

"This opens up new application opportunities for Gigabit Ethernet technology. We are truly satisfied with the installation result," said Tomasz Niewolik, manager of the office representing MICROSENS in Eastern Europe.

3R Signal regeneration

The connectivity was achieved by using optimised optical converters. Due to special DFB lasers (Distributed Feed-back Laser) MICROSENS was able to increase the distances for Gigabit Ethernet significantly.

In particular, high transmission rates over long distance optical transmission lines can develop physical effects that can cause distortion of the signal (jitter,
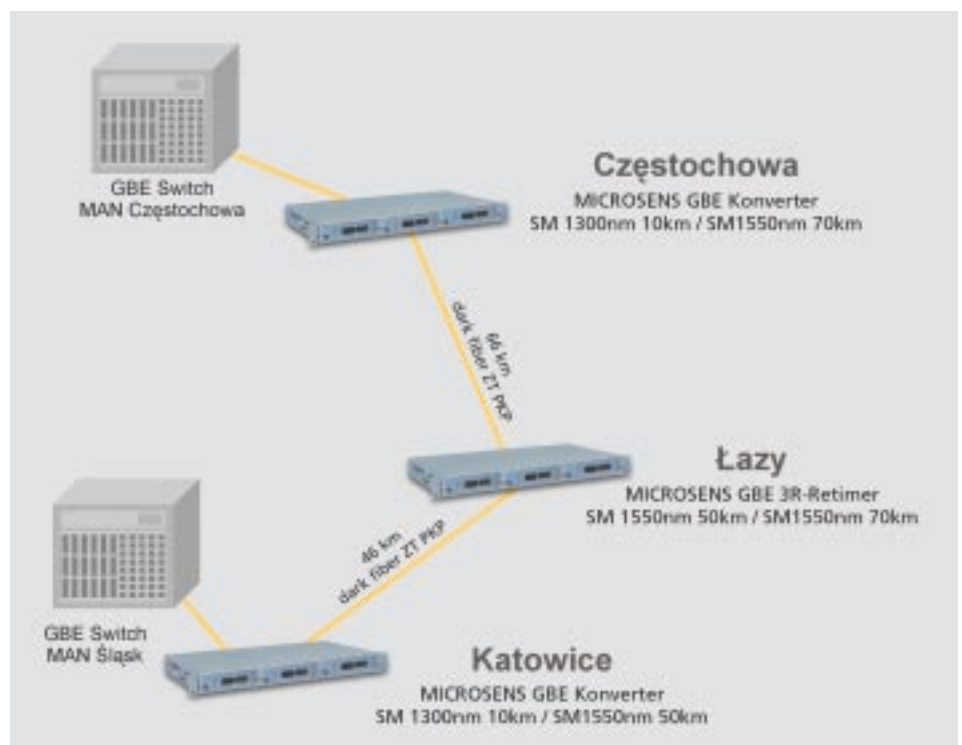
dispersion). To avoid this, the signal is completely regenerated during transmission. This process is commonly called 3R (Reamplification, Reshaping, Retiming). This means that during transmission the amplitude, the signal, and the timing are regenerated.

Converters with retiming can support Gigabit Ethernet (1.25Gbit/s) and Fibre Channel (1.0625Gbit/s). This means that they can also be deployed for coupling pure high-speed data networks in the SAN area (Storage Area Network).

The deployment of converters with a retiming function enables the implementation of much longer transmission distances, especially for data transmission rates in the gigabit range. Several long-distance converters with segments of up to 70 kilometers (44 miles) can be cascaded. The 3R converter is deployed wherever regeneration is required because of signal distortion. This applies to single mode connections over large areas, as well as local multimode links.

Further information can be found at
www.microsens.com/uk/produkte/rck_3R.htm

GBE Switch MAN Częstochowa

Częstochowa
MICROSENS GBE Konverter
SM 1300nm 10km / SM1550nm 70km

66 km dark fiber ZT PKP

Łazy
MICROSENS GBE 3R-Retimer
SM 1550nm 50km / SM1550nm 70km

46 km dark fiber ZT PKP

GBE Switch MAN Śląsk

Katowice
MICROSENS GBE Konverter
SM 1300nm 10km / SM1550nm 50km

8 Channel CWDM System
max. 2.5 Gbit/s per channel

Growing demand for bandwidth as a result of increasing data volume leads inevitably to the extension of backbone capacities. There is a possibility here to lay new fiber optic lines, what is connected with high planning, time, permissions and cost expenses. A faster and cheaper approach is to use more efficiently existing fiber optic lines by means of the active multiplex technology of MICROSENS.

The WDM systems make it possible for telecommunication services providers, ISPs, metropolitan network operators, as well as for enterprises with large networks to expand quickly and cost-effectively the capacity of existing fiber optic lines.

With these systems, the customers can use dark fibers optimally, at their discretion. By the use of MICROSENS WDM technology, the effective capacities of backbone connections can be flexibly and quickly customized to the given requirements. Thus shifting of this capacities through the reconfiguration of the network can be performed immediately.
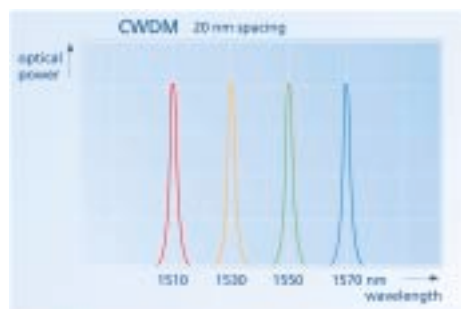
CWDM technology

The CWDM-based systems work in the third optic window by 1550 nm with the 20 nm distance between channels. The components enable the data transfer rates of up to 2.5 Gbit/s per channel and direction. Connecting to the single mode network with stepped transfer distance of up to 70 km occurs by means of the line interface. As an access interface 850 nm multimode or 1300 nm single mode ports are alternatively at the customers disposal.

By means of WDM systems four or eight (in the extended version) independent high-speed services can be transmitted over one single mode line.

4 channels over single simplex fiber

By means of higher integration the connection capacities can now be doubled. The user is able to transmit 4 independent high-speed services over single simplex fiber. With this system the maximal transfer distance of 35 km can be achieved.
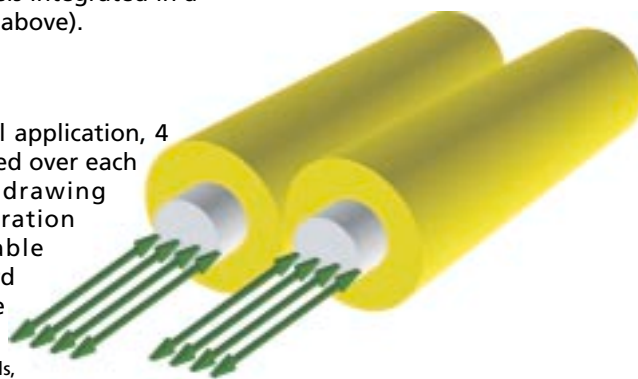
8 channels on 1 HU

By the combination of two of these 4 channel-systems eight services can be transmitted over one standard duplex connection. The advantage of such an application is full separation of services.

In an extended product version, the user can have 8 channels integrated in a 1HU chassis (see photo above).

Security

In the eight channel application, 4 channels are transmitted over each simplex fiber (see drawing below). This configuration brings considerable advantages with regard to security. The failure of one connection means that four of the eight services are still available. Through the intelligent switching the reconfiguration of the network can take place. The WDM systems can thus be fully integrated with the security policy of the customer.

The high data rates of the individual channels enable the transmission of services as ATM OC-12, ATM OC-48, Gigabit Fibre Channel and Gigabit Ethernet.

Manageability

All the systems offer one slot for connection of the optional SNMP / web based management module (sold separately). The module is able to evaluate current operating conditions, e.g. power supply, fan status, temperature and connection status. With the RPSU System (Redundant Power Supply Unit), the internal power supply can be additionally protected.

The use of the WDM technology provides an efficient solution, which enables to multiply the capacities of the already existing fiber connections without intervention in the infrastructure.

Further information can be found at www.microsens.com/metro/

8 Full Duplex Gigabit channels, each 4 channels per simplex-fiber

Industrial Fiber Optic Ethernet

Industrial Ethernet - the vendor-independent standard of communication

Ethernet has been recognized as a networking standard for many years. It is not limited to office applications. Using special hardware components, it is perfectly suitable for industrial applications.

Factory automation, network technology, office and the Internet do not have to operate as separate worlds. More and more often they create modern structures. Such transparent and efficient networks result in measurable profits for enterprises.

Down to the production of middle sized companies, there is a demand for increased performance in manufacturing systems, cutting response times and optimizing production processes. A standarized platform is necessary for a homogenous and transparent communication.

MICROSENS offers a wide range of media converters and switches in robust industrial cases which can be used in rough manufacturing environments. MICROSENS guarantees fast putting into operation, simple installation and 100% compatibility.

MICROSENS switches can connect manufacturing system elements equipped with Ethernet interfaces, such as controllers, robots or numeric machines. The use of switch technology enables collision free connection. These high-quality components ensure that all important working parameters of the industrial devices, such as resistance, high availability and fault-free operation, are preserved.

5 port switch

Up to four 10/100Base-TX devices can be connected to the switch. The copper ports automatically detect the speed of the connected device (10/100 autonegotiation). The 100Base-FX uplink connection provides communication with the central switch. The link can operate as half-duplex (100 Mbit/s) or full-duplex (200 Mbit/s). The Auto Crossing feature automatically recognizes the pinout of a TX port, so a standard patch cable can always be used.

Serial converters

Special RS-232, RS-422 and RS-485 media converters enable seamless protocol conversion. The RS-485 converter is compatible with various industrial bus systems, such as Profibus, Bitbus or Interbus.

For more flexible bus installations, the converters are equipped with the SUBD-9 connector, as well as with a screw terminal connector.

Ethernet/Fast Ethernet media converters

MICROSENS's portfolio of industrial products also covers Ethernet (10Base-FL/10Base-T) and Fast Ethernet (100Base-FX/100Base-TX) media converters. The converters are equipped with a cross over switch for adjusting the RJ-45 connection to the existing pinout. Therefore, a typical, widely available 1:1 patch cable can be used for the connection.

Additional features

The fiber optic socket is placed on the bottom of the device, preventing dust and other particles to reach the optical transceiver.

The relay contacts can be used to connect external alarm systems which can invoke certain actions in case of failures.

All devices are equipped with braces for direct mounting on 35 mm hat rails. Components are powered by an external 24 V AC adapter. A redundant adapter can be connected to the second clamp.

Further information can be found at www.microsens.com/industry/

Autumn 2001 Events

Networld+Interop
18.-20.09.2001 Paris

Only a small number of visitors were present at this year's Networld + Interop exhibition in Paris. This, however, is entirely justified by the summer's business slowdown and the tense political situation. On the other hand, we were pleased to devote more time to our existing and new customers, technological decision makers and end users.

NETW⊕RLD +INTEROP

Systems
15.-19.10.01 Munich

The leading topic of the international IT and communication industry fair Systems in Munich was "To detect general IT and communication trends, to deploy convergent solutions, to exploit synergies and to reflect future business processes".

At the Systems, MICROSENS

SYSTEMS 2001
15.-19. Oktober; München www.systems.de

was represented by its long-term partner, Spezialkabel München from Munich.

Cabling Systems
23.-25.10.01 Paris

Despite the continuing political trouble around the world, the atmosphere at Cabling Systems Europe was good. We showed IT specialists our "Fiber to the Office" and WDM, as well as Enterprise Access solutions. MICROSENS began various projects with its established and new partners. The projects are expected to be completed in

STAR CABLING SYSTEMS EUROPE

the coming months.

"Fiber Optic Made Easy"
Road Show
Graz, Salzburg, Vienna

In order to present our successful

Highspeed Cabling

initiative "Fiber to the Office" concept to a broader public, we organized a road show in cooperation with our Austrian partner Highspeed Cabling, at the beginning of November. With specialists for measurement technology, cabling systems and "Fiber to the Office" we presented future trends and characteristic phenomena occurring in

this industry. The tour plan was as follows: Graz on 6.11, Salzburg on 7.11, and Vienna on 8.11.

The presentations were made in selected hotels, in a nice atmosphere. MICROSENS, a leader in the fiber optic industry, presented a wide choice of FTTO ("Fiber to the Office") products and converters. Corning Cable Systems presented the latest solutions in fiber optic and copper cabling for workplaces and buildings. Agilent Technologies explained the higher requirements with regard to the cabling and showed the capabilities of the latest models of channels and links.

exponet 2001
20.-22.11.2001 Cologne

From 20-22nd November the most important autumn IT industry event took place in Cologne. In 8 halls, on a total area of 70,000 square meters with over 700 exhibitors, the exponet Cologne 2001 presented itself.

MICROSENS, a manufacturer of internationally successful systems, presented various products, from solutions for enterprise LANs and access networks to metropolitan networks (MANs).

Current IT trends were presented at the exponet scenes and special forums. MICROSENS's contribution to this was a lecture by our Technical Director Hannes Bauer on "Intelligent management of FTTO solutions" (every day, 3:00 p.m., DialogCenter "Networking and Infrastructure I", Hall 2.2).

Further information on fairs and other events can be found at www.microsens.com/uk/ messen2001.htm

exponet
Cologne 2001
Messe Köln 20.-22. November