MICROSENS
fiber optic solutions
www.microsens.com
10 Years MICROSENS fiber optic solutions 1993-2003
news 5
No. 5, November 2003

Dear readers, dear partners,

The economy needs a boost. Right now, everyone in Germany is looking to policy-makers to send out encouraging signals. None has been forthcoming, while the media has been painting a rather black picture of the economy.

The Americans are ahead of us in one important aspect: despite economical problems worldwide, they still look forward with confidence. But it isn't stronger economic growth that keeps them going so much as it is their much better marketing.

In Germany we are speaking of complaining on high level. Just because the growth forecasts haven't become reality doesn't mean that the IT industry is breathing its last. In fact, it has been proven that IT investment did not go down in 2003.

In this market, the only companies to survive will be those who know how to weather turbulent times and to adapt to new customer requirements.

2003 has been another year of growth for MICROSENS – yet another bright chapter in its 10-year-long success story. This newsletter contains not only product information but also our cordial invitation to you to look back on our history together.

Have fun reading!

Thomas Kwaterski
Marketing & Sales Director

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10 Years MICROSENS

Time flies when you're always focused on the future. For 10 years, we've been pushing innovation, offering our customers advanced technology at reasonable prices.

By developing and manufacturing fiber optic solutions for data systems, telecommunications and networks, MICROSENS has brought fast, secure data transfer to the world of fiber optics.

Join us in looking back on 10 years of MICROSENS – page 2.

MICROSENS staff presented the management with the "family tree" and lauded the company founders, (left to right) Thomas Kwaterski, Dr. Hocine Bezzaoui and Hannes Bauer, for their pioneering spirit.

Miniature Snap-In Switch with SNMP, VLANs and CoS

MICROSENS has added integrated management to its flagship of their "Fiber To The Office" solution. As the most compact product in its class, it offers no-tool snap-in assembly, making it extremely easy to install.

The features implemented in the switch already meet all the requirements to build a future-proof network.

Read more on page 4.

Power-over-LAN for IP Cameras

Power-over-LAN functionality gives users access to a wealth of potential applications.

In cooperation with Axis, MICROSENS presents the fiber optic connection to IP-based cameras via PoLAN switches.

Read more on page 7.

Modular CWDM/DWDM System

The product range of optical multiplex systems just got a new modular solution. The system offers flexible configuration as well as advantageous upgrade and maintenance capabilities. Its CWDM technology also makes it a cost-effective entry platform.

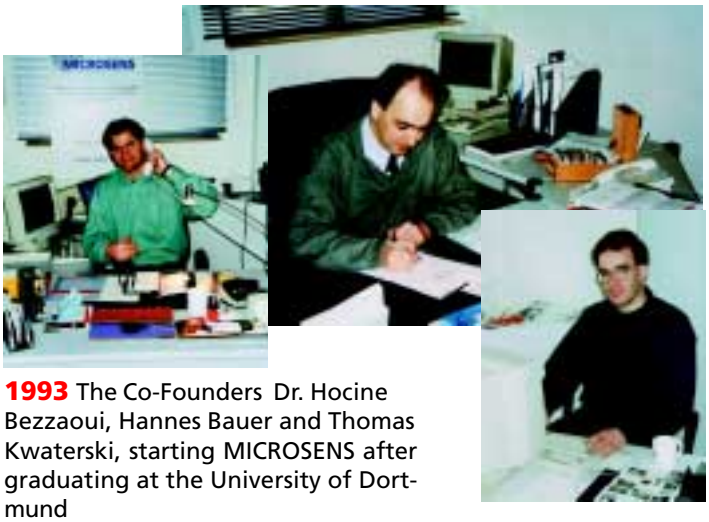
Read more on page 8.

10 Years of MICROSENS

From the first beginnings to one of the leading manufacturers of fiber optic transmission systems! We can look back on a 10-year-long tradition of success. Without the trust of our customers and partners, we would not have been able to make the jump from a technology start-up to a multinational high-tech corporation.

From our headquarters in Hamm, Germany, and our four branch offices on three continents, we currently serve more than 10,000 satisfied users. One of the biggest keys to our success is the motivation of our staff to go that extra mile in everything they do.

Our portfolio has long since outgrown simple media converters to encompass highly sophisticated optical transmission systems. Possible applications include in-house fiber optic networking to access networks right up to optical multiplexers in metropolitan area networks.



1993 The Co-Founders Dr. Hocine Bezzaoui, Hannes Bauer and Thomas Kwaterski, starting MICROSENS after graduating at the University of Dortmund

1993 A little known fact: it all began with an environmental instrumentation system that connected the sensors over plastic optical fibers. And the name was born: microsensors = MICROSENS

1994 The first series of 10Base-FL transceivers in an aluminium case manufactured in a complex milling process. Not yet suitable for mass production

1994 First major contract – a fiber-optic PPC system based on RS-232 converters. The predecessor to the modular converter system is born

1995 The first installation hub for use with cable channels. The "Fiber To The Office" strategy is born. Since its inception, more than 50,000 devices have been deployed

1994 The product portfolio is focussed – fiber optic converters for 10 Mbps Ethernet, video and serial interfaces. The products are still handmade, one-of-a-kind products

2001 The company enters a new market – fiber-optic solutions for industrial environments. The biggest attention-grabber is a switch with a patent-pending Ethernet ring-recovery mechanism

2003 The latest generation of products includes optical multiplex systems with transfer capacities reaching 40 Gbps

1993 The set-up phase at the Technology Centre in Hamm

1995 In-house production begins

1996 Move to the new building in the Technology Centre. The fast-growing MICROSENS quickly fills three floors

1998 Asia Representative Office in Singapore

1999 Eastern Europe Representative Office in Poland

1999 Western Europe Representative Office in Paris

2002 MICROSENS Inc. Toronto, Canada

1996 Production is expanded. Nonetheless, it is still hard to keep up with the strong demand for converters

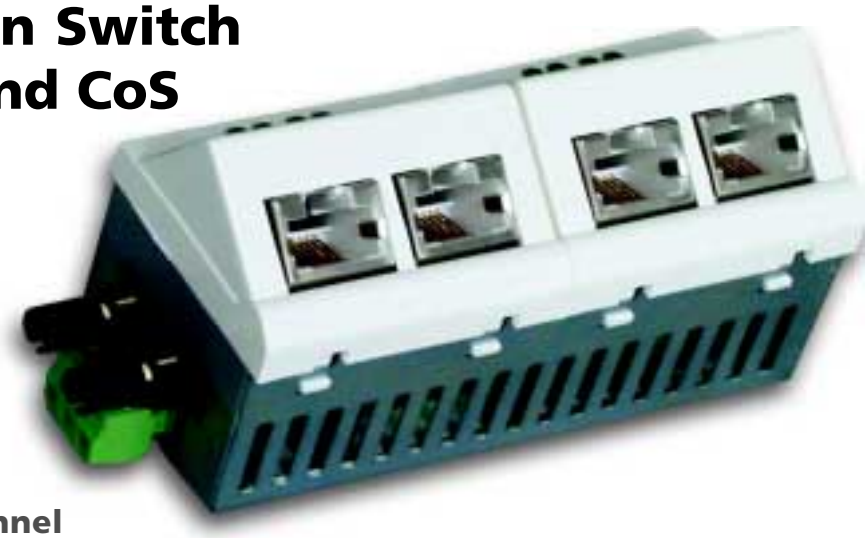
1998 Taking the plunge – purchase of a separate building on Küferstraße with enough floor space for the company to continue growing

2000 Capacity increased further by a new SMD production line with a vapour-phase soldering system that reduces component stress

2000 Dortmund Chamber of Industry and Commerce awards the "Silver Caduceus" in recognition of successful corporate growth

Fairs Focus on customer commitment. MICROSENS has always had delegations at all key international events: Hanover, Paris, Singapore, Tokyo, Atlanta, Birmingham, Poznan, Cologne

Miniature Installation Switch with SNMP, VLANs and CoS



With the MICROSENS installation components, you can intelligently combine the advantages of fiber optics and twisted-pair cabling in a future-proof investment that will pay off for years to come.

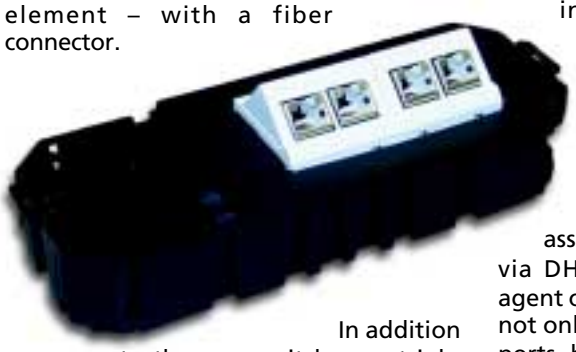
Because the fiber optic connection from the central switch or hub is converted to copper lines, there is no need to install fiber connectors on the end devices, e. g., PCs, laptops, printers, IP telephones, etc. Instead, they are connected directly to the installation switch using standardized twisted-pair patch cables.

Snap-In

Besides an extremely compact footprint, the 45x45 design offers no-tool snap-in installation, making set-up extremely easy. The switch also provides compatibility with standard installation systems in use all over the world (e. g. in the U.S.A., Europe...).

Sub-Floor Installation

Installing the new switch below flooring is a "snap". It can even be installed in a double connection box – the smallest floor-mounting installation element – with a fiber connector.



In addition to the new switch, one triple connection box may contain other connection elements, too, such as a passive FO exit box. This makes it possible to floor-mount a combined FTTO and FTTD solution in one single connection box.

Surface Mounting

Nor is surface-mounting the switch difficult at all. There are a host of manufacturers of mounting and wiring systems whose standard installation accessories include surface-mounting elements.

Channel Mounting

Since not all manufacturers support the 45x45 mm mounting system for perimeter trunking and cable channels as yet, MICROSENS offers a specially designed universal adapter that allows users to partake of the benefits of snap-in installation. The adapter has to be mounted only once, on the standard screw plate of the E2 connection box in the perimeter trunking. Once this is done, the switch can be installed and uninstalled by simply clicking it into the catch on the 45x45 system. No tools are needed.

Management

An expanded version with an integrated management agent (SNMP or web-based) offers class of service (CoS) for VoIP applications and full VLAN functionality in accordance with IEEE 802.1Q.

All manageable switches have their own IP addresses, which are assigned manually or automatically via DHCP. The network management agent configures the switches, specifying not only hardware settings on individual ports, but also defining CoS and VLANs. The switch ships with powerful management and configuration software called Device Manager.

Installation switch mounted in surface-mounting box

Fiber to the Office

www.microsens.com/uk/produkty/inst_switch45x45.htm

Features

- Smallest available installation switch mountable in cable channels and floor tanks
- Fast, snap-in installation without tools
- Installation in cable channels and floor tanks
- Integrated management agent, SNMP/web-based
- Manual/automatic configuration of all ports
- Implements full-featured VLAN functionality
- Class of service (CoS) for VoIP applications

Universal Management for all Product Series

Device Manager Software 3.0

Version 3.0 of Device Manager, the application for configuring and managing MICROSENS components, is now available. It comes with many convenient features for configuring devices and monitoring the entire network, and is compatible with all device families. It supports installation switches as well as manageable desktop devices and industrial switches. This permits different device families to be combined in one network.

New User Interface

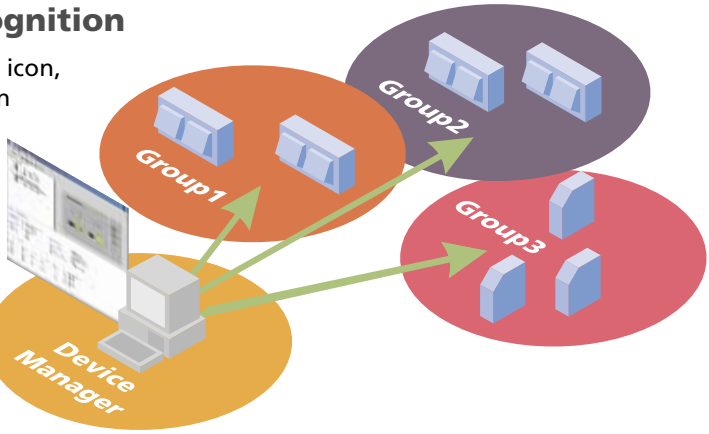
While launching the Device Manager 3.0, it brings up the revamped user interface. The interface is split up into three areas that display detailed information on the current device and provide an overview of the entire network.

The most significant addition is a feature that maps the network structure onto a tree diagram that displays the group structure and current status. Any device selected in the tree is visualized in a second window, as are the LED displays and the device ports. A third window simultaneously displays detailed status information on all data provided by the device.

Automation

Device Manager's main purpose is to reduce the workload of network administrators so they can do their job better. It does this by providing numerous functions to automate and streamline routine tasks.

Network Recognition



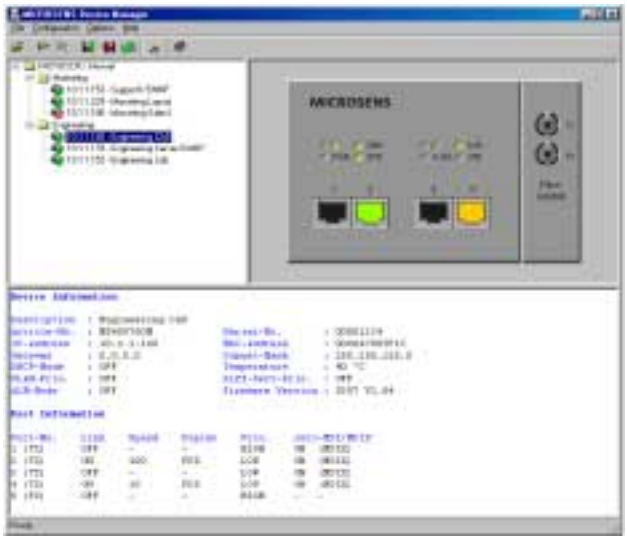
At the click on a icon, administrators can initiate the automatic detection and capture of all MICROSENS devices in the network. This generates a device list that can be exported to Excel or any other standard spreadsheet program for further examination. The most important new feature is the ability to logically structure the network into device groups. For example, the devices can be grouped by location (campus, building, floor) or according to functional criteria (departments).

Device Status

Once the network configuration has been detected, it takes only another click to query and visualise the current status of all network devices. Icons in the tree display indicate the current state of the network and help administrators detect potential trouble spots before they flare up.

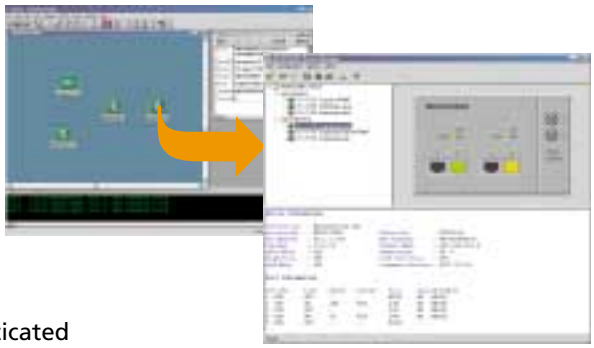
Configuring Devices

The graphical user interface is where all device functions can be configured, from simply setting ports right up to defining a sophisticated VLAN. Once defined, a configuration can be saved to a file and assigned to the current device or even to all devices in a group on the network.



Integration with other Platforms

Another addition to Device Manager is its ability to interface with other management platforms as a visualization tool. A command-line mode is available to directly pass the IP address of a managed device. That means that Device Manager can be launched from the management platform whenever the administrator needs to display a particular device.



Features

- Management of the entire MICROSENS family (installation, desktop and industrial devices)
- New user interface with network mapping
- Management in groups
- Automatic device detection
- Exports device configuration (port settings, CoS and VLANs)
- Interfaces with other management platforms

New-Generation 12 and 24-Port Converter with TELCO

The Ethernet/Fast Ethernet multiport converter for 19" assembly now has a slew of new features.

Not only does it offer high port density with 12 / 24 ports on one height unit, it also comes with additional functions such as SNMP / web-based management, a redundant power-supply jack and auto-crossover.

Its small footprint offers the highest possible port density for switching cabinets which is available on the market.

The converter connects to the central switches with TELCO clustered cables. The cables connect 12 twisted-pair ports via one single connection, making installation a flexible, easy matter.

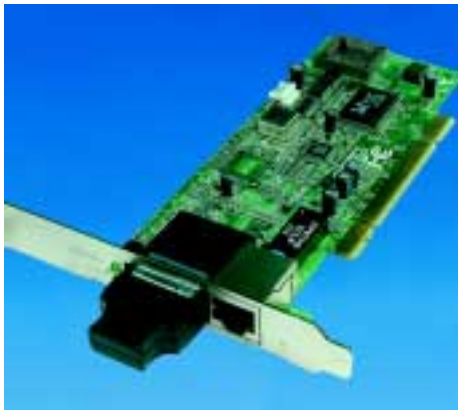
The converter comes furnished with the widely used ST and SC fiber-optic connectors. It ships in multimode versions or in single mode models for distances of up to 125 km.

More information at:
www.microsens.com/uk/produkty/k12fxtx.htm or mk24pfxtx.htm

Features

- Compact 19" footprint , 12 / 24 ports on one HU
- Flat design for high port densities
- TELCO clustered plugs for fast, easy installation
- Slot for optional management agent (SNMP / web-based)
- Optional redundant power supply unit

PC Adapter Card PCI/100Base FX with 10/100Base TX Port



The MICROSENS Ethernet PC Adapter Card enables the direct connection of a PC via optical fiber. The card sports a powerful, highly integrated controller and supports full duplex and Bus-Master DMA (32 bit) transmission.

In addition to the fiber connector, the network adapter has an additional copper port with Auto-Negotiation.

The card also supports the Microsoft 'Plug and Play' standard and is automatically configured during boot-up. Various drivers are available for the card, offering extensive support for all common operating systems.

The card supports Wake-on-LAN power management. An optional boot EPROM is available for diskless workstations.

More information at:
www.microsens.com/uk/produkty/ac100fx100tx.htm

Features

- Powerful, highly integrated Fast Ethernet controller
- 100FX + 10/100TX port
- PCI Plug 'n Play, full duplex support
- Extensive driver support for all common network operating systems
- Optional boot EPROM for diskless workstations
- Wake-on-LAN power management

7 Port Mini Switch with SNMP, VLANs and PoLAN

The MICROSENS 7 Port Miniature Switch enables the connection of up to 6 end devices via twisted-pair cables. An optional 100Base-FX port can be used as a fiber optic uplink to the central switch or hub.

Power-over-LAN functionality according to the new IEEE802.3af standard is integrated into the device so that it can power end devices.

Since the mini switch also has management functionality, it can be monitored centrally in a network. Shipped with the switch is the Device Manager software, which enables simple configuration and monitoring of individual devices or even the entire network.

In addition to full VLAN implementation in accordance with IEEE 802.1Q, the switch supports CoS for VoIP applications.

More information at:
www.microsens.com/uk/produkty/swtxfx6p100.htm

Features

- Compact design, 7 ports, 6x 10/100Base-TX, 1x 100Base-FX
- Power-over-LAN functionality as per IEEE 802.3af
- Management for configuration and monitoring, SNMP optional
- Class of Service, port and packet-based prioritisation IEEE 802.1Q (VLAN tag), IP TOS field (DiffServ.)

Connecting IP Cameras with Power-over-LAN Switches

Successful Partnership for Intelligent Solutions

MICROSENS and AXIS have agreed to strategically cooperate in the field of Power-over-LAN applications. The two companies signed the contracts for this premium partnership in early September.

Application

Both firms collaborated to design a solution that intelligently networks AXIS IP cameras with MICROSENS Power-over-LAN switches. The switches supply the cameras with electrical power.

IP camera with MICROSENS desktop chassis

Since the switches have fiber uplink ports, this solution can cover long distances. This product combination can be deployed in any number of scenarios: from monitoring industrial production processes to video conferencing right up to the cost-effective surveillance of entire sites.

Power-over-LAN Switches

MICROSENS' new installation switch is fitted with an add-on module that provides Power-over-LAN functionality (new IEEE 802.3af standard). The module supplies the 48 V DC for Power-over-LAN as well as two additional 10/100Base-TX ports. With these features, the switch not only transmits data, but also powers any connected end devices such as IP telephones, access points, web cameras, etc. via twisted-pair cables.

This obviates the need for a dedicated power supply and allows an emergency power scheme to be implemented uniformly in an IP communications infrastructure such as VoIP. As such, the switch can be protected by an uninterruptible emergency power supply that is also used for servers and PCs.

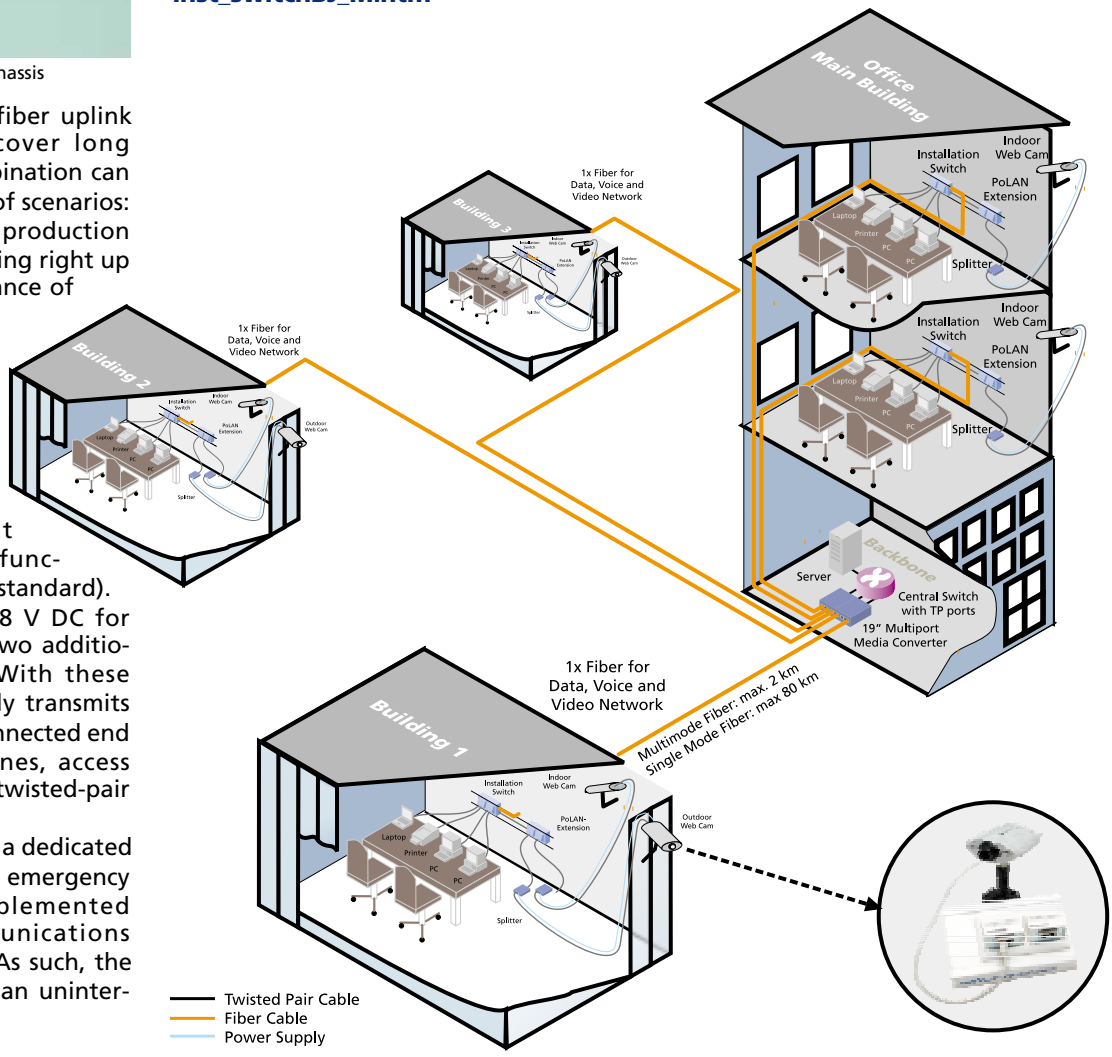
What was previously a 4-port Fast Ethernet installation switch has been upgraded to a 6-port switch with integrated Power-over-LAN. In addition to the models that can be mounted in cable channels, there are also desktop devices with external power supplies.

AXIS

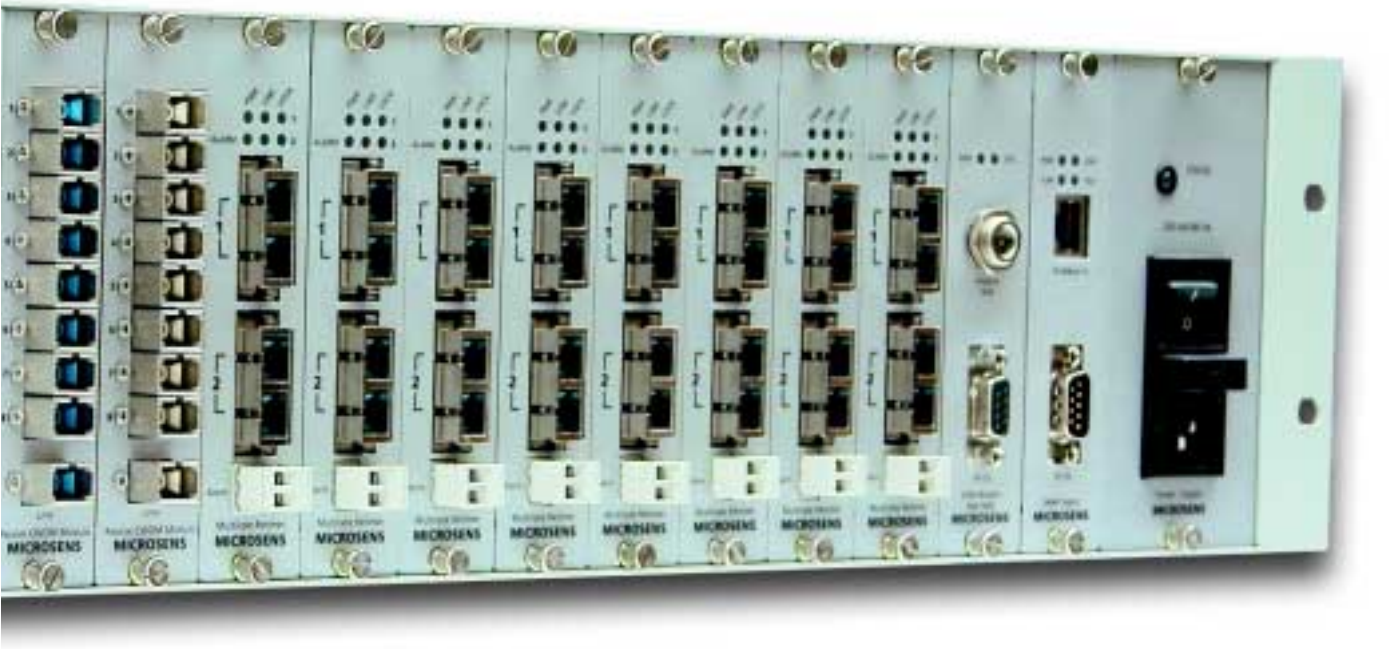
Axis is an innovative market leader in network peripherals for digital video solutions and print servers. Axis' products and solutions are focused on applications such as security surveillance, remote monitoring (network cameras and video servers) and document management (print servers). Axis was founded in 1984 and is listed on the stock market in Stockholm. The company operates globally with offices in 14 countries.

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

In front of the MICROSENS headquarters in Hamm: Mr. Isenbeck (Account Manager MICROSENS) and Mr. Weckeck (Key Account Manager AXIS Communications)



New Modular CWDM/DWDM System

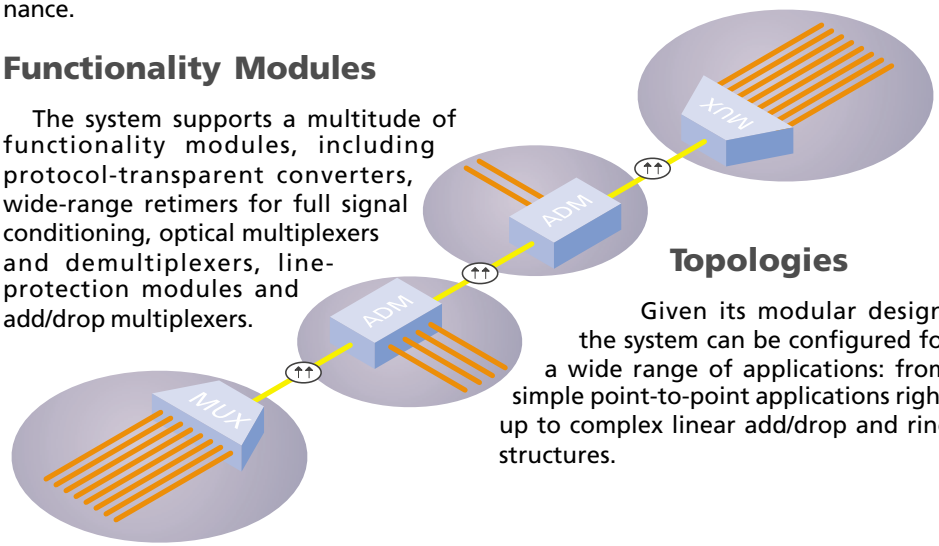


The new xWDM Chassis System, joins MICROSENS existing modular Access platform and has so much built-in flexibility that it can be deployed by telecommunications providers, metropolitan carriers or even in sophisticated backbone applications.

The system is based on a new telco chassis that can be installed in 19" racks. It occupies 3 HU and accepts up to 28 modules. Its modular construction provides maximum flexibility for configuration, expansion and maintenance.

Functionality Modules

The system supports a multitude of functionality modules, including protocol-transparent converters, wide-range retimers for full signal conditioning, optical multiplexers and demultiplexers, line-protection modules and add/drop multiplexers.



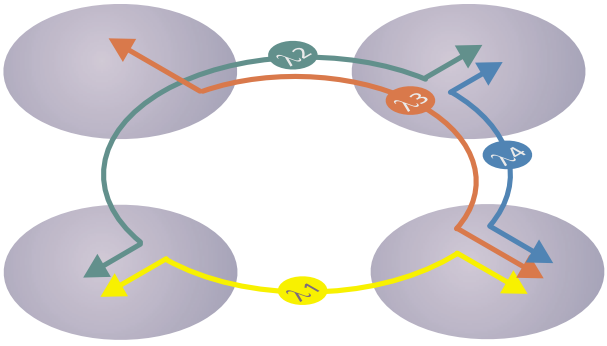
There are also redundant power-supply modules that provide fail-safe power to all installed units. The system is fully compatible with MICROSENS' modular Access Platform, and users can choose from numerous access modules that flexibly convert media for a variety of protocols.

Protocol Transparency

User data transmission is transparent, and not restricted to any particular protocol. The system supports all common protocols such as Fast Ethernet, ATM OC-3/OC-12/OC-48, Gigabit Ethernet, ESCON, FICON and Fibre Channel. Its optimised design provides an optical budget of 24 dB, thus making transfer distances of at least 80 km possible.

Topologies

Given its modular design, the system can be configured for a wide range of applications: from simple point-to-point applications right up to complex linear add/drop and ring structures.



More information about xWDM at:
www.microsens.com/metro/index_en.htm

More product information at:
www.microsens.com/uk/produkty/8WDMmodular.htm

Features

- Low entry costs due to CWDM technology according ITU G.694.2
- Simple expandability and maintenance by modular structure
- Low initial costs - only the actual used channels are installed
- Protocol transparent for applications up to 2.5 Gbps
- Optimized construction, therefore distances up to 80 km possible
- Point-to-Point, Linear Add-/Drop- and Ring structure possible
- Optional Line-, Channel- and System-Protection

Passive 8 Channel CWDM Mux/DeMux

The new passive MICROSENS multiplexers greatly increase the transmission capacity of fiber connections in metro networks. These devices combine several optical channels with different wavelengths to simultaneously transmit several services across one optical fiber without interference.

Universal Deployment

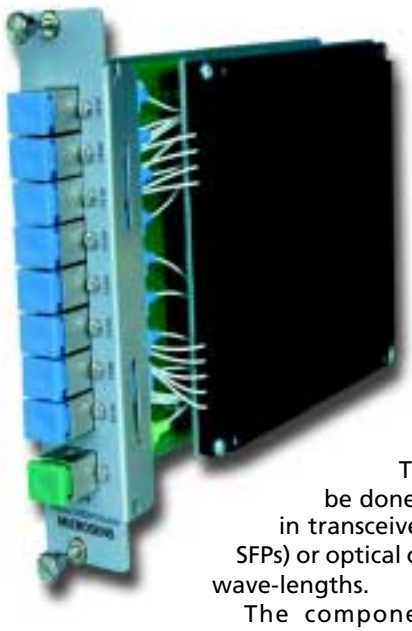
The multiplexer/demultiplexer modules are just one example in a broad product range of functionality modules for installation in MICROSENS' modular rack systems. The multiplexer can be combined with any other module of the Enterprise Access family.

Applications

Network carriers using WDM as their transmission technology can build an infrastructure that can be upgraded as needed. Capacity can be expanded in any part of the network - no other technology offers comparable benefits. Cable network operators, for example, can switch additional cable TV services through the existing infrastructure without having to worry about any repercussions from combining bidirectional data services with unidirectional television transmission.

Passive Multiplexing

In multiplexing, a wavelength filter bundles different colours of the spectrum on one fiber for transmission. At the other end of the link – the receiving endpoint – the wavelengths are demultiplexed, e. g., split off from the bundle again. That means that a transmission link always comprises a multiplexer and a demultiplexer.



For bidirectional transfers, both the originating endpoint and the receiving endpoint are equipped with their own multiplexer and demultiplexer. Since this is purely passive multiplexing, the individual optical signals have to be supplied to the multiplexer on their assigned wavelengths.

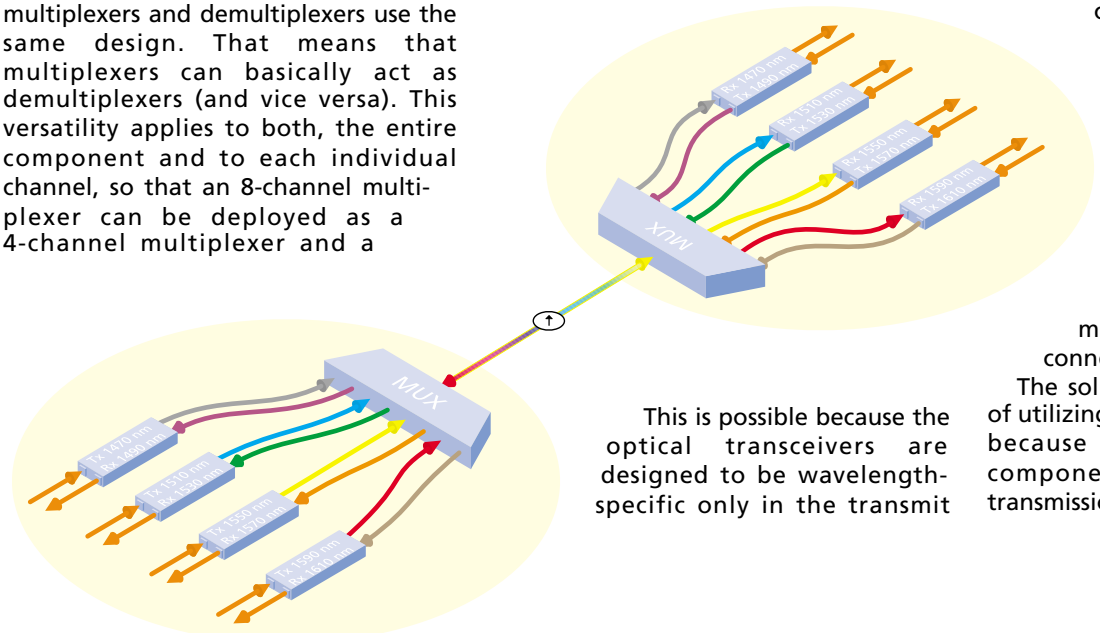
This part of the task can be done by MICROSENS' plug-in transceiver modules (GBICs and SFPs) or optical converters with CWDM wave-lengths.

The components were designed specifically for an easy installation and operation.

Cost-Optimizing 4-Channel Transmission via one simplex Optical Fiber

The transmission of up to four CWDM channels over one single optical fiber can be optimized by intelligently selecting the components.

The optimization is based on the fact that passive filter-based optical multiplexers and demultiplexers use the same design. That means that multiplexers can basically act as demultiplexers (and vice versa). This versatility applies to both, the entire component and to each individual channel, so that an 8-channel multiplexer can be deployed as a 4-channel multiplexer and a 4-channel demultiplexer. In such a deployment, 4 CWDM channels are used in one direction of transmission and 4 channels in the other direction via single passive multiplexer.



This is possible because the optical transceivers are designed to be wavelength-specific only in the transmit direction. Since the device on the other end receives broadband, it can basically receive any of the CWDM channels.

With such devices, you can construct a CWDM channel with different CWDM wavelengths on both sides of the connection. For example, Transceiver A transmits on 1470 nm, but receives 1490 nm. At the other end, Transceiver B transmits on 1490 nm and receives 1470 nm from the other transceiver.

Selecting the right transceivers and proper cabling to the multiplexer makes setting up a simplex connection a lot easier.

The solution offers the extra benefit of utilizing the optical budget to the full because it doesn't require any components to be added to the transmission line.

Access Platform

MICROSENS' Modular Access Platform is an open system with a multitude of functionality modules for LAN and WAN applications and for the conversion of telecommunications and industrial interfaces.

The system has been designed to make it easy to integrate new technologies into an existing network structure, providing maximum flexibility and a guaranteed return on investment. Depending on the model, the functionality modules can do media conversion, speed adaptation, distance extension and wavelength conversion.

More product information at:
www.microsens.com/access/index_en.htm

New TELCO Chassis with 28 Module Slots

A 3 HU chassis with 14 module slots used to be the biggest-possible unit for applications where a multitude of interfaces had to be converted centrally. If users needed more ports, they had no other option than to install additional chassis, taking up more height units. New applications such as the modular CWDM system require even higher module densities.

To satisfy these requirements, MICROSENS has unveiled a new 3 HU chassis that doubles capacity from 14 to 28 module slots. The chassis accepts modules inserted at the front and the rear. The two sides each have 14 slots and are wired like a combined 28-slot chassis in terms of both power supply and management. In other words, every module can be powered by a central power supply and monitored by a central SNMP agent.

Power Supply

All modules in the chassis are powered in the Access Platform by power-supply modules that each occupy 2 slots. Several power supplies can be installed in parallel if the system needs to be particularly fail-safe.

Management

If supported by the modules installed from the chassis, they can be monitored and configured using a central management agent. Installed modules can be managed via SNMP, Telnet or integrated webserver.

Fan Modules

The chassis is equipped with two fan modules for system operation. Each fan module occupies 3 slots and can be monitored by the central management agent, in order to detect fan failures.

Features

- Extreme versatility
- Two-sided layout for highest module density
- Up to 28 module slots
- Central power supply with optional redundancy
- Supports hot-swapping of modules
- Fully compatible with all modules in the Access series

Gigabit Ethernet Bridge

The new Gigabit Ethernet Bridge offers speed adaptation for Ethernet, Fast Ethernet and Gigabit Ethernet copper networks (10/100/1000Base-T) and simultaneous conversion to optical fiber.

Applications

The bridge is the ideal component for access applications because engineers can use it to create a uniform fiber optic backbone structure based on Gigabit Ethernet. Users can connect to the network at exactly the speed they need. The transmission rate can also be set via remote management – a particularly attractive feature for carriers.

Pluggable Transceivers

The fiber port has the modular design of a GBIC or SFP slot. And it doesn't matter if you have twisted-pair or fiber-optic ports for multimode or single mode transmission – with the right pluggable transceivers, just about any media can be combined with any other.

There is a wide range of GBIC modules to choose from. Depending on the transceiver module, data can be transmitted over 100 km on a single mode optical fiber without optical repeating.

Signal Regeneration

The bridge uses the store-and-forward procedure, enabling segmentation splitting as well as 3R signal regeneration. This means that network designers can cascade any number of individual Gigabit Ethernet fiber segments.

An integrated link-through function passes the connection states of the individual segments so that, if the connection to the switches fails, it is possible to quickly switch over to redundant connections.

Access Platform

The MICROSENS bridging module are hot-swappable so that the entire system can be reconfigured quickly. The converter can be deployed in the central Access Platform, or as a standalone unit in a desktop housing.

With the optional management agent, components can be imple-mented in existing SNMP and web-based environments.

More product information at:
www.microsens.com/uk/produkty/rck1000tlx.htm

MICROSENS 3R Technology for Erdgas Münster

ERDGAS MÜNSTER Headquarters

It is the oldest pipeline gas company selling only German natural gas. Since 1959, ERDGAS MÜNSTER has been active in an area bounded to the West by the Dutch border and to the East by Saxony-Anhalt.

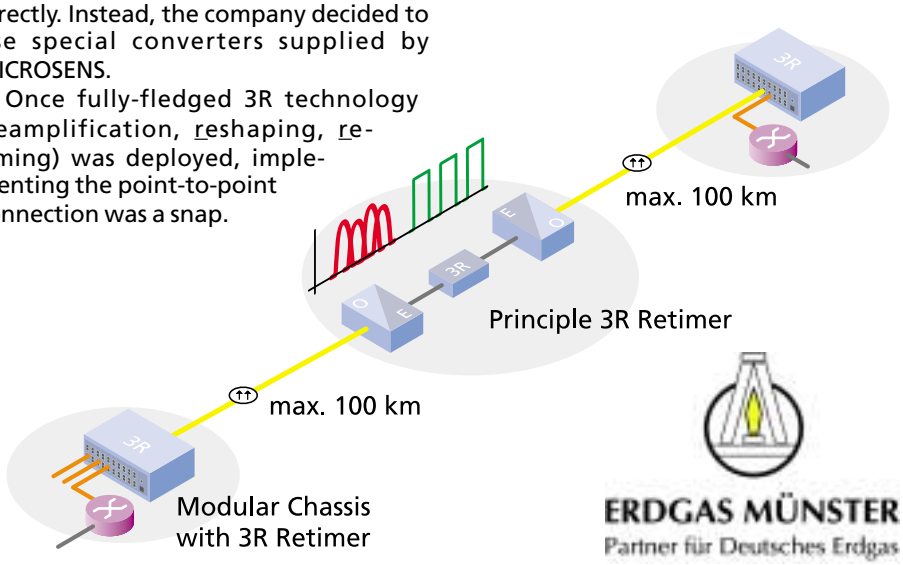
A high-pressure pipeline network spanning over 2,000 km connects the natural gas fields of German producers with ERDGAS MÜNSTER's customers.

Along the transport pipelines are fiber optic lines acting as the infrastructure for the company's internal data communications. But it was finally time to replace the old switching equipment with Gigabit Ethernet technology.

Because of the physics of the situation, it was not possible to connect the transfer distance of some 150 km directly. Instead, the company decided to use special converters supplied by MICROSENS.

Once fully-fledged 3R technology (reamplification, reshaping, retiming) was deployed, implementing the point-to-point connection was a snap.

The connection was split up into two segments that were connected by fiber/fiber converters with full signal regeneration.



ERDGAS MÜNSTER
Partner für Deutsches Erdgas

City of Limoges Deploys MICROSENS Solutions

When it comes to connecting various research institutions in the French city of Limoges to the optical high-speed ring RENATER, the Limoges Educational and Research Network (RELIER) places its trust in MICROSENS products and solutions.

Applications

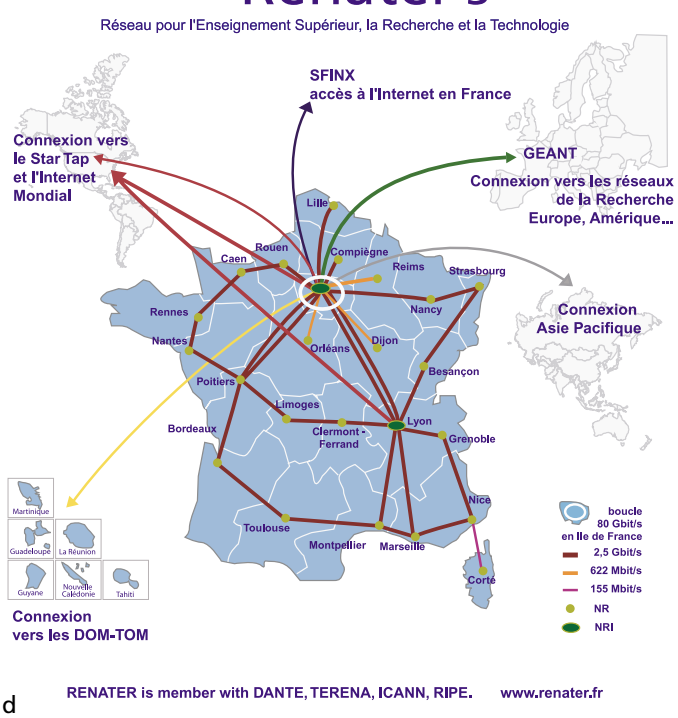
Future applications include holding video conferences, broadcasting television programmes and providing direct access to digital libraries. The extremely high transmission capacities that this requires have been implemented by consistently deploying Gigabit Ethernet technology in the main ring lines. In addition, all subscribers can install their own internal networks (intranet, telephony, video...) on dedicated fiber optic lines.

This high-speed network is a fail-safe configuration that can easily be migrated. It uses single mode optical fibers in order to support emerging technologies, thereby ensuring that the research network will remain economically for years to come.

Topology

Transmitting research data is a touchy affair: the network must be highly secure and offer protected network access. The optical main ring line uses a redundant design, serving each site via two physically separate routes to minimise the risk of failures. The entire network is implemented end-to-end with optical fiber, enhancing access security.

The project was completed in record time in cooperation with the TechnoMan design office and MICROSENS' long-standing partner Spie Communications in March 2003, after a mere 19 months.



MICROSENS Gigabit Converter Provides Top Security

Networking Oil Rigs in the South China Sea

Around 200 km south of Hong Kong, surrounded on all sides by the tempestuous South China Sea, Santa Fe Energy Resources of China Ltd. is conducting a field development project at its two oil-production sites, Panyu 4-2 and 5-1.

19 km of choppy sea separate the two oil rigs, which pump the petroleum through underwater pipelines to a special tanker.

The primary communications link between the two production sites consists of fiber optic cables integrated into the underwater power cable. The offshore facilities are networked in a ring-shaped Gigabit Ethernet (GE) backbone, creating a LAN that requires no extra routers.

The general contractor, Radio Holland Group (RHG), asked Telescience Singapore Pte Ltd. to find a reliable, scalable and cost-effective solution.

So Mark Lee, an account manager at Telescience, and his team of engineers crunched numbers in cost analyses and ran technical tests. "We looked at several solutions, but MICROSENS was the best for us. It allowed us to optimise costs per user port without having to make any concessions in overall network availability or reliability."

At the endpoints of the single mode fiber are MICROSENS' Gigabit Ethernet converters, making sure that data is transported across the backbone ring at 1,000 Mbps over distances of up to 80 km right up to the copper switching port.

In order to withstand the extreme operational conditions of heavy vibration and motion, the converters were installed in a 1 HU housing with a redundant power supply.

The Partner Program – Key to our Success

Goals

- Obtain projects and boost sales
- Enhance know-how
- Direct contact with MICROSENS

Our partners are our number-one priority. This is the heart of the MICROSENS Partner Program – our work with our partners. In projects, where the focus is shifting to solutions, it's becoming ever more important to provide high-quality advice to customers. If a company intends to position itself successfully in converging European markets, it needs not only reasonable prices, but also speed and versatility. However, responsiveness to customer requests should be linked with solution competency and in-depth knowledge of the product range.

So the keys to success are twofold: know your products, and know your market.

Our partners can obtain precisely these advantages from the MICROSENS Partner Program.

Partner Levels

The four Partner Program levels have been tailored to market requirements and our presence in global markets. MICROSENS' indirect distribution model puts the focus on our competent partners.

Value Added Distributor (VAD)

Value Added Distributor offer the entire MICROSENS product range and are involved in international two-tier activities. Their client base consists of system integrators and regional re-sellers. Key products are kept in stock for customers.

Advanced Solution Partner (ASP)

Advanced Solution Partners are national system integrators who position themselves in the market with solutions and services. They offer solution competency for their strategic retail clients.

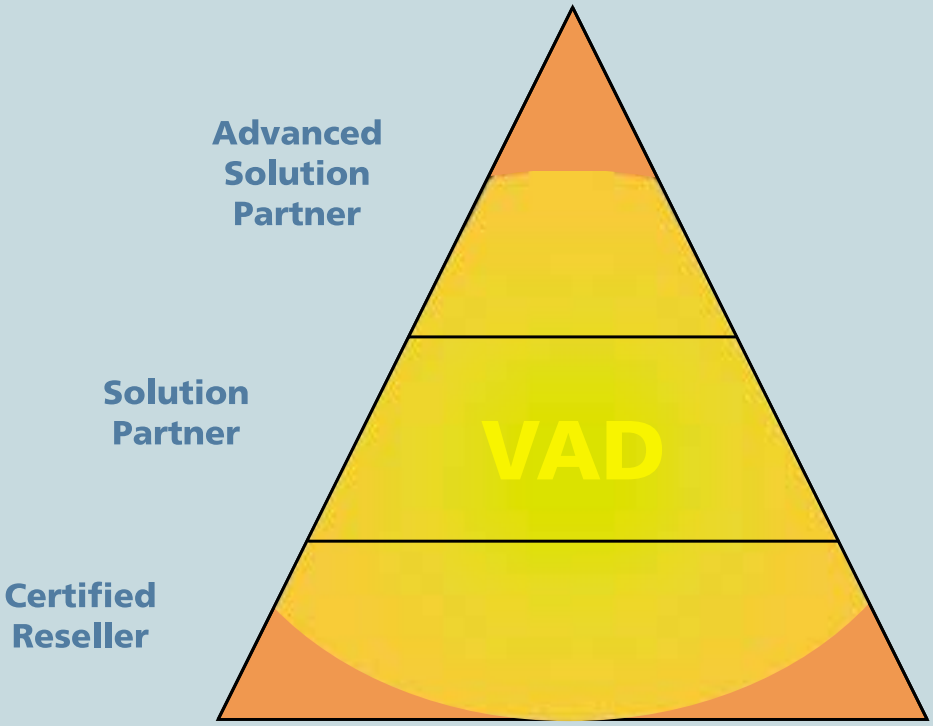
Solution Partner (SP)

Solution Partners are system integrators serving retail clients directly with solutions within a particular geographical area or within certain product segments.

Certified Reseller (CR)

By being certified by MICROSENS or a Value Added Distributor, Certified Resellers can quickly translate their unique advantages into business success.

The Partner Pyramid



The benefits for partners at a glance:

- Savings in purchasing
- Joint marketing and co-branding campaigns
- Regular partner training
- Preferred range of services
- Increased sales
- More efficient customer support

MICROSENS Industrial Switches with Ring Functionality monitor Windmills

Windmill operators have to be able to guarantee a steady supply of power, no matter what the wind and weather conditions are at their onshore or offshore farms. Like modern power plants, windmills have to be controlled, regulated and monitored. The only way to handle all these functions is the flexibly network connection of all windmills in a given wind farm. And that entails crossing vast distances, especially in the new offshore parks.

Requirements

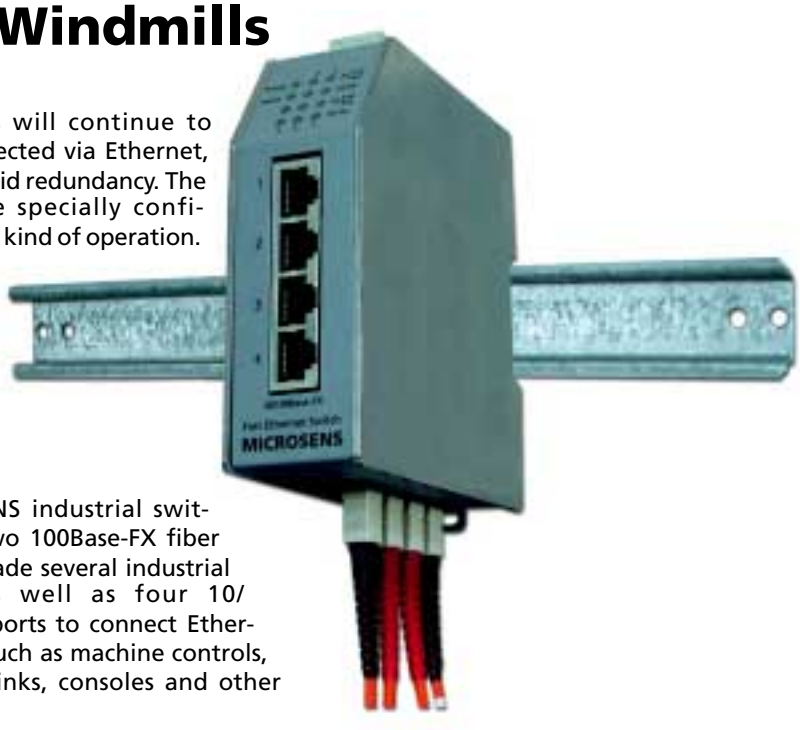
First and foremost, the data transmission has to be robust and reliable. Hundreds of data records need to be transmitted from the windmill to the central controller regularly and reliably. In order to run the farm, opera-tors have to know some key information such as:

- Wind conditions
- Rotor-blade alignment
- Temperature and pressure data
- Power output levels
- Alarm messages

MICROSENS Ethernet fiber optic industrial switches meet all these requirements and ensure that data transmission is immune to interference.

Ethernet Fiber Ring

The protective mechanism developed by MICROSENS allows users to implement an error-tolerant Ethernet ring. If a component or a connection fails, the intelligent ring topology ensures that all other nodes will continue to remain connected via Ethernet, providing rapid redundancy. The switches are specially configured for this kind of operation.



Features

MICROSENS industrial switches offer two 100Base-FX fiber ports to cascade several industrial switches as well as four 10/100Base-TX ports to connect Ethernet devices such as machine controls, network uplinks, consoles and other nodes.

www.microsens.com/uk/produkty/ind_switch4TX2FXring.htm

Benefits

- Matching fiber optic modules for distances of up to 120 km
- VLAN functionality for a secure connection to system management
- Standard SNMP management interface for monitoring and configuration
- Protected by MICROSENS' ring-recovery protocol
- Powerful software tool

Maximum Security with Ring Recovery Protocol

- Patented procedure for providing error-tolerant Ethernet rings
- High system availability
- Redundant fault-recovery time of < 100 ms
- Ring recovery without impairing network performance
- Reliable master/slave scheme

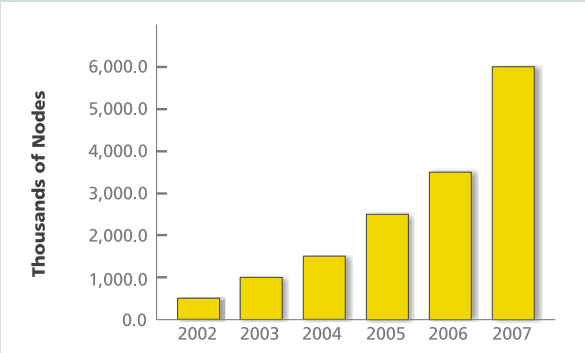
Industrial Ethernet Gaining Ground

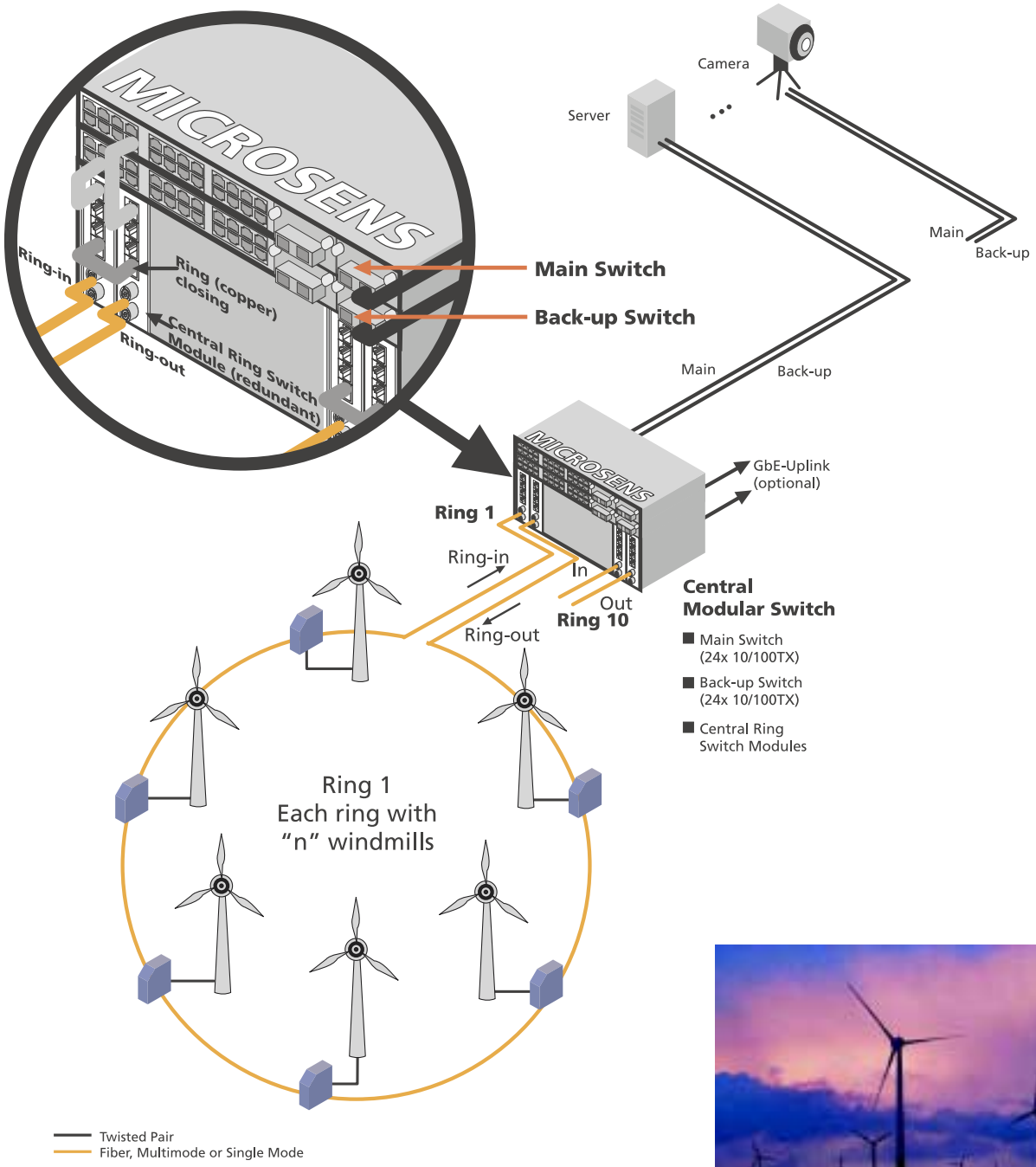
A recent study published by the ARC Advisory Group predicts that the global market for industrial Ethernet devices will grow by more than 84% per year over the next five years.

ARC states that more than 286,000 nodes were installed in 2002 alone. In 2007, over 6.06 million nodes are expected to be installed.

Industrial Ethernet is fast becoming the make-or-break technology in industrial automation. Its popularity is being fed from two directions: a growing user acceptance and a steady increase in the number of suppliers.

Having spotted this trend long ago, MICROSENS now offers a diverse portfolio of solutions for industrial applications.





Windmill Network with Ring Redundancy

The configuration consists of two systems: the central controller and the windmills, which are interconnected in a ring topology.

Central Controller with System Redundancy

The central controller (19" rack system) consists of two Fast Ethernet switches with an 8.8 Gbps backplane. The entire system is designed to be fully redundant so that, in the event of failure, the attached end devices (surveillance cameras and central data server) and the central interfaces to the ring will remain accessible.

The decentralized rings are terminated centrally using special, redundant switch modules and then connected to the main and back-up switches.

Each windmill is connected to the fiber optic ring via a manageable MICROSENS industrial switch.

The advantage of this ring configuration is its redundant routing, which enables the windmills to remain accessible even when the optical fibers are interrupted.

Events in Fall 2003

NFOEC
07.-11.09.2003 Orlando

At the NFOEC (National Fiber Optic Engineers Conference) in Orlando, Florida, MICROSENS presented its current CWDM solutions for Gigabit Ethernet multiplexing.

Mr. Heller, Managing Director MICROSENS Inc. North America giving his presentation "xWDM Multiplexers".

INVEX
06.-10.10.2003 Brno

Held in the Czech Republic, Invex is an international trade fair for information and communications technology and one of the most important IT events in Eastern Europe. We presented our current system solutions together with our partner Atlantis Datacom. The highlight of the show was the demonstration of the FTTO installation in the Czech offices of Olympus AG in Prague.

OPTO 2003
21.-23.10.2003 Paris

The Parisian trade fair OPTO 2003 lasted from October 21st to 23rd. This event spotlighted the latest optical solutions for metropolitan networks. MICROSENS made a significant contribution: Branch Director Danzel d'Aumot gave a presentation, and we participated in Opto City, a live presentation of WDM technology at the metro level.

exponet
18.-20.11.2003 Cologne

"Up With Efficiency, Down With Costs!" Such is the rallying cry among IT decision makers – and one of the focal points of the Exponet 2003 in Cologne. Again this year, more than 800 exhibitors are gearing up to receive more than 70,000 visitors.

This international trade fair and network-engineering convention wouldn't be complete without MICROSENS. We traditionally unveil innovative solutions at the Cologne Exponet.

Networld+Interop
19.-21.11.2003 Paris

NetWorld+Interop in Paris is the main meeting point for the IT industry. With all the key providers and technology decision makers in attendance, it is an important presentation platform for technological innovations. MICROSENS presents interesting new products every year at NetWorld+Interop.

Recent information on trade fairs and other events at: www.microsens.com/uk/event_nav.php

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Fiber Optic Workshop

With the assistance of our Value Added Distributor Anixter, we conducted a joint series of seminars in late October/early November dealing with fiber optic trends in LAN applications.

Redefining distribution℠

WIRE • CABLE • CONNECTORS • LOGISTICS

A total of six workshops were given in Gladbeck, Stuttgart and Munich, where resellers and planners took the opportunity to get actively involved.

Competent speakers gave presentations on transmission standards, measurement technology and active network components.

Summer Partner Training

This year's Partner Training courses in August marked the kick-off of the new MICROSENS Partner Program.

The first training class in Hamm was attended by numerous multinational MICROSENS partners. Experts flew in from the US, the Netherlands, Belgium, the Czech Republic, Poland and Bulgaria to learn more about the latest products for metropolitan and industrial applications.

Participants in the first MICROSENS Partner Training course in August 2003 at the headquarters in Hamm.

Partner Reaches 25 Years

SKG, our long-standing distribution partner in Austria, is celebrating its 25th anniversary this year.

Invitations were sent out to meet at a private airfield near Vienna, where loyal customers could delight in a slew of attractions such as gliders and planes, paragliding and balloon rides.

We would like to wish our partner and the entire SKG team many more years of success.

MICROSENS congratulates SKG's management: (left to right) Mr. Richter (Executive Manager MICROSENS), Mr Sebastian and Mr. Gaida (SKG Management), Mr. Kwaterski (Marketing & Sales Director MICROSENS).

Editorial

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