

**HIRSCHMANN**  
Rheinmetall Elektronik



**MR**  
Family

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With more than 10,000 installed networks, Hirschmann is a market leader in Europe, involving standards ETHERNET, Fast ETHERNET, TOKEN RING, FDDI, ATM and ISDN. Because users know that quality is the factor when it comes to security and reliability in the network, and solutions from Hirschmann prove themselves in the long term, whether at Mercedes-Benz, BMW, the Volkswagen works or the Metro in Paris. At all levels of communications technology - from WANs and office networks to industrial control.

When it comes to network technology, Hirschmann is an innovative and reliable partner who can also be counted on for providing comprehensive service and support. One of the locations of our approx. 300 contractual partners in Germany or international representatives is always close by. Our service and support is rounded off by workshops offering intensive training in this rapidly developing technology.

The MultiLAN Switch MR 8-03 is designed to offer you a cost-effective option for implementing an efficient control centre for your distributed networks. The strengths of the MultiLAN switch are particularly evident at the points where different types of cable are to be connected and large distances - even in ring structures - are to be bridged. Even overloaded networks can gain extra capacity through network restructuring. And with the integrated management capability you can configure and monitor the MultiLAN Switch using SNMP.



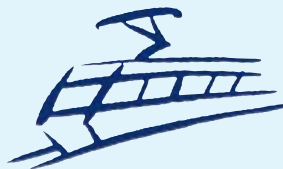
The true capabilities of the MR family especially come to light in a full-duplex ETHERNET for sites located up to 40 km away. As a cost-effective alternative to ATM, as well as an offer to smaller companies, a systematic option for the paperless organisation of document and image administration along with simultaneous access for multiple users at the same time. With fibre optic interface cards, all floors of a building can be connected in a star shape from one device. The modular design of Hirschmann switches offers you flexible configuration at an attractive price/performance ratio.





No matter whether it comes to expanding existing networks or completing the building of new communications facilities - Hirschmann products integrate a range of different terminals and software applications to create highly-reliable systems for industrial use.

No company can afford unproductive processes in its network nor can it tolerate network failures. Especially not industrial companies. Because when manufacturing comes to a halt, contracts are lost and investment contend in the millions have to be written off as losses. The MultiLAN Switch from the MR family allows you to create an efficient work group and high-performance switching control centre for distributed networks along with keeping a handle on everything at the management as well as at the information level. From a central location in a building, the self-learning high-speed switch carries out restructuring in sub-nets thereby increasing the bandwidth available to each user.



Low entry costs, sensible modularisation, upgrade options and downward compatibility guarantee that Hirschmann solutions offer maximum cost-effectiveness.

Whether as networking components in a computer complex or between main nodes - MultiLAN switches in the MR family are also in demand in the traffic guidance technology area because they are highly-effective and reliable even in the most severe environmental conditions (temperature, humidity, electromagnetic interference).

The Hirschmann **MultiLAN Switch MR8-03** is a self-learning high-speed switch which is installed in a central location of a building to segment networks. The different floors of a building are connected over fibre optics from this device in a star shape. The ASGEs, MCs, AMCs and WGs are used on the floors. The network is divided into several subnetworks. This kind of restructuring provides overloaded networks with additional capacity. With the increasing efficiency of PCs, workstations and applications, networks today are coping with steadily-growing data volumes. Network segmentation reduces the number of users in a network thereby increasing the average bandwidth available to each user.

- New capacity reserves for overloaded networks
- Passive synchronous high-speed bus provides maximum security and throughput
- FDX/HDX and cut-through mode configurable per port
- Coupling of up to 8 ETHERNET networks possible
- Can also be configured with 24 V-DC input

The MultiLAN Switch MR 8-03 allows a number of simultaneous and independent connections to be set up between the individual ports. Local traffic is filtered. You can use up to 50 filters on the destination, source and type/length field. Moreover, filter settings can be in any logical combination. Network interconnection is not protocol-specific.

|                                |  |  |
|--------------------------------|--|--|
| <b>Memory Module</b>           | EBGM-V24                                 |  |
| <b>Media</b>                   |  |  |
| <b>AUI</b>                     | EBAUI<br>1 Port with AUI socket          |  |
| <b>Fibre Optic Multimode</b>   | EBMM-BFOC<br>1 Port with BFOC connectors |  |
| <b>Fibre Optic Single-Mode</b> | EBSM-BFOC<br>1 Port with BFOC connectors | EBSM-P-BFOC<br>1 Port with BFOC connectors |
| <b>Twisted-Pair</b>            | EBTP-RJ45<br>1 Port with RJ45 connector  |  |

ETHERNET

FAST  
ETHERNETTOKEN  
RING

FDDI

ATM

ISDN



MR 8-03

#### Technical Data

##### MR 8-03

##### Power Supply (except with MR 8-03 24 VDC)

|                            |   |
|----------------------------|---|
| - Input Voltage            | 230 V/120 V                                   |
| - Input Frequency          | 50 Hz/60 Hz                                   |
| - Power Consumption        | 100 VA per supply unit                        |
| - Interference Suppression | VDE 0871 Curve B (10 kHz-30 MHz)              |
| - Safety                   | IEC 950, EN 60950, VDE 0805<br>Safety Class 1 |

##### Interfaces

1 6TE card slot for Global Memory Module; 8 6TE cards slots for 3HE Switch Interface cards; synchronous high-speed bus for ETHERNET

##### Standard

IEEE 802.3, IEEE 802.1 (d) Spanning-Tree-Alg. Rev. C and Draft 9  
Address table: 10,000 address entries

##### Software Storage

Flash-EEPROM

##### Management

Inband management over SNMP, outband management with user interface over V.24 (RJ11 socket), Telnet

##### SNMP Support

MIB II, Bridge MIB (RFC 1286), Private MIB

##### Throughput Time

|                    |  |
|--------------------|--|
| - Normal Mode      | 100 µs - 1,3 ms, depending on packet size                    |
| - Short Delay Mode | <190 µs for all packets (measured from beginning of packets) |

##### Configuration

MDI-X and HDX/FDX switchable, Network Number, Filtering, Learning, Spanning, Tree, Short Delay Mode, Relay Mode

##### Mechanical construction

|                         |                    |
|-------------------------|--------------------|
| - Dimensions W x H x D  | 449 x 177 x 297 mm |
| - Weight                | approx. 6 kg       |
| - Operating Temperature | 0 °C to + 50 °C    |

##### Delivery Specifications

##### 19" Rack mount, 4HE safety type IP 30

- Bus board with 9 6TE card slots
- Combination module (network switch, interference suppressor filter, connector for non-heating apparatus
- Network cable, 2 m long with socket for non-heating apparatus and earthing-pin plug
- 2 plug-in power units ENT 10515-R AC
- Network voltage switch (230V/120V)
- Fans
- Mounting angle for affixing to 19" cabinet

##### Product Designation

|               |                            |
|---------------|----------------------------|
| MR 8-03       | Order No.                  |
| MR 8-03 24VDC | 943 240-001<br>943 240-101 |

##### Accessories/Spare Parts

|  |                          |
|--|--------------------------|
| Plug-In Power Unit<br>ENT 10515-R AC   | Order No.<br>743 970-101 |
| Plug-In Power Unit<br>ENT 10515-R 24DC | 743 070-101              |
| MR Dummy Mask Set                      | 943 466-001              |

The architecture of Hirschmann MultiLAN switches is designed to be highly flexible and safe. The Synchronous High-Speed Bus is a passive bus system with 640 Mbit/s throughput capacity. The redundantly designed power units guarantee high availability. This allows uninterrupted operation even in the event of power unit failure. The robust and electromagnetically shielded rack mount ensures interference-free and reliable operation even in industrial applications environments. This device is also available as **MR 8-03 24 VDC** with 24 VDC. In addition, the MultiLAN switch can be managed over SNMP which allows you to carry out configurations through SNMP or to monitor data traffic.

The modular design enables the switch to be customised individually to the respective network. The 8-port switch has eight slots for ETHERNET switch interface cards. A further card slot is reserved for the **ETHERNET Switch Global Memory Module EBGMO-V24** which is delivered with the MultiLAN switch. The ETHERNET Switch Global Memory Module forms the centre piece of the MultiLAN switch and must always be used in conjunction with it. All data and address tables are temporarily stored in this central memory. Each ETHERNET switch interface card has direct access to this shared memory.

This is also where the integrated agent is available. It can be operated inband (SNMP and Telnet) as well as outband V.24 through the use of a Windows-orientated user interface. The automatic transmission of alarms (traps) when major events or faults occur and the display of important operating parameters through LEDs on the front panel make for simple equipment monitoring. The configuration management at system and port levels offers additional filter functionality (source addresses, destination addresses, type field, port), permanent reset configuration storage, VLAN configuration at the port level as well as creation of redundant paths via spanning tree.

The complete integration of MIB II (RFC 1213) and bridge MIB (RFC 1286) and port-related performance and fault counters offer effective monitoring of network traffic. Password protection for the user interface and extensive access protection provided through the assignment of users to different access domains ensure a high level of access security.

The connection of Hirschmann MultiLAN Switches in full-duplex operation (sending and receiving simultaneously) enables a collision-free transmission bandwidth of 20 Mbit/s. Due to different factors, e.g., the number of users or the use of different protocols, the 10 Mbit/s ETHERNET has an effective throughput of 30% to 40% of the theoretical value. Because of collision-free operation the complete bandwidth can be utilised, thus providing an effective throughput of 2 x 10 Mbit/s.

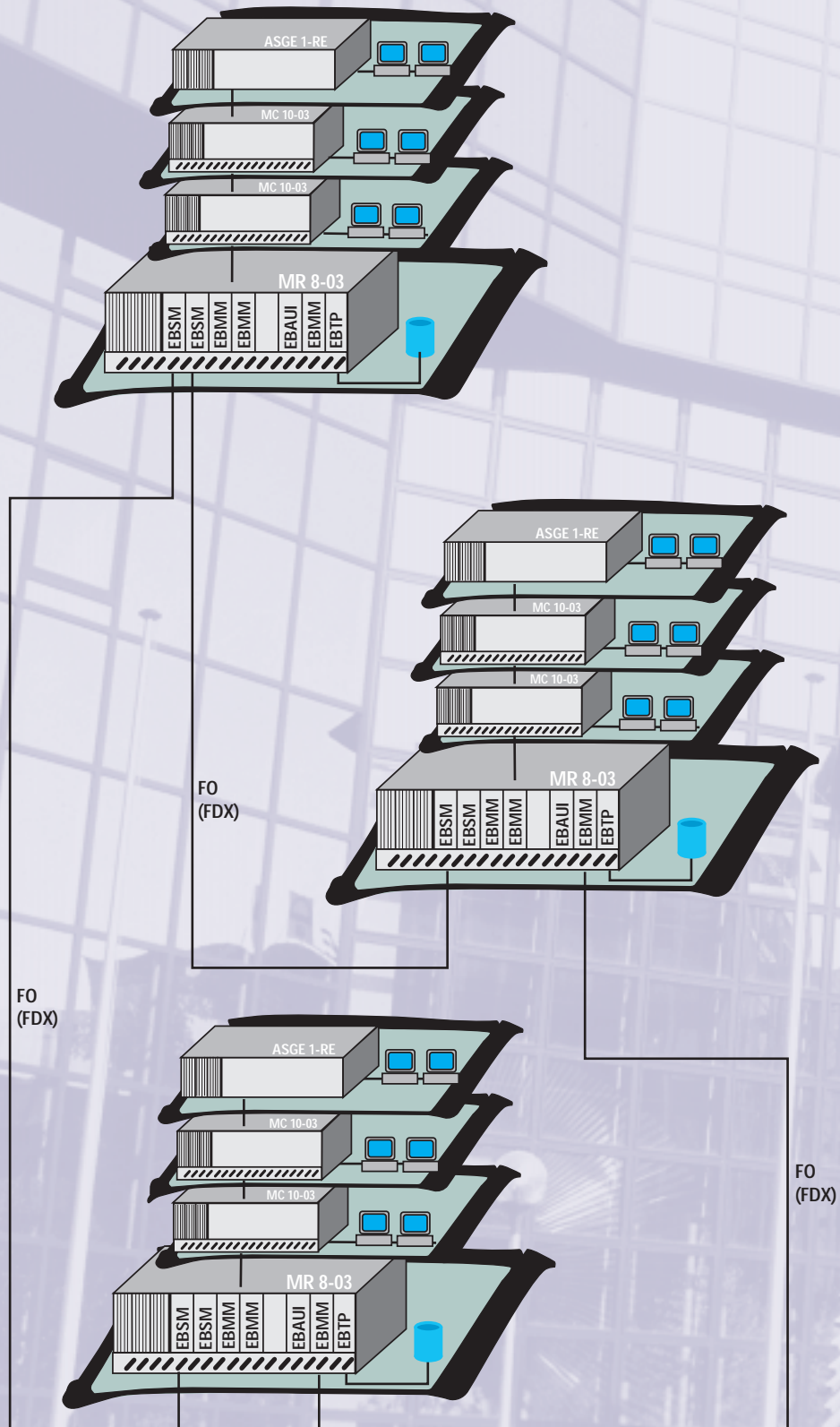
In short-delay mode, very short run times can be handled through the MultiLAN switch. This involves the output port forwarding the first data while the input port is still inputting data. The spanning tree algorithm is retained throughout. This algorithm enables the automatic detection of loops and consequently the setting up of redundant paths.

|                          |   |
|--------------------------|---|
| Product                  | Order No.   |
| <b>EBGM-V24</b>          | <b>943 241-002</b>  |
| Interfaces               | 1 Terminal connection (V.24)  |
| Displays                 | Power, Learning, Filtering, Spanning-Tree   |
| Functions                | <ul style="list-style-type: none"> <li>- Temporary storage of data which is received by interface cards</li> <li>- Provides transmittal data on system bus, interface cards</li> <li>- Provides storage space for one address table</li> <li>- Manual reset of system through recessed reset key</li> <li>- Central control</li> <li>- ETHERNET address</li> <li>- Storage of central data</li> </ul> |
| Mechanical constructions | 6TE Plug-In Module  |
| - Dimensions W x H x D   | 30 x 128 x 255 mm   |
| - Weight                 | approx. 180 g   |
| - Operating Temperature  | 0 °C to + 50 °C   |



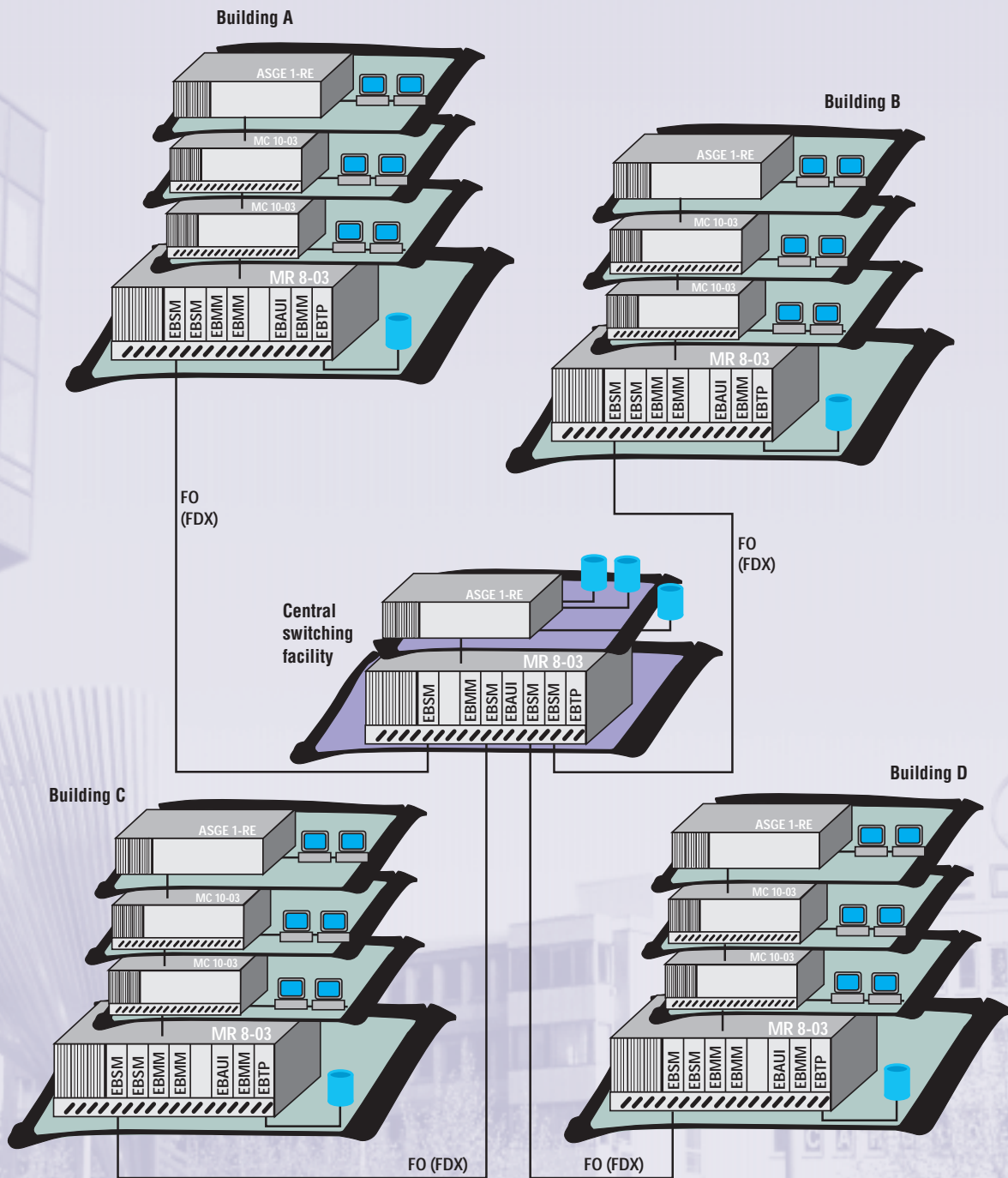
EBGM-V24

# MR FAMILY



Full-duplex backbone

- Full-duplex site backbone (20Mbit/s) using fibre optics
- Switched backbone in a building for connection of the floors, structured secondary cabling
- Floor distributors (concentrators) for terminal connection



#### Collapsed-Backbone

- Collapsed backbone on campus (central distribution of segments from a central switching facility)
- Switched backbone in a building for connection of the floors, structured secondary cabling

**ETHERNET Switch Interface Cards** are available for the MultiLAN switch for several different media. You can use the multimode cards to build a backbone by connecting the different floors in a star-shaped configuration to the central switch. The single-mode boards enable the bridging of large distances which is perfect for campus networking and applications in traffic guidance technology. The modules with AUI or TP ports allow the attachment of coax or TP segments or the direct connection of devices. All interface cards work in compliance with the IEEE 802.3 standard. Each card contains a processor and its own respective software. Therefore there is no negative impact on performance, no matter how many interface cards are installed.

- Interface cards available for multimode, single-mode, AUI and twisted pairs
- Remote processors on the interface cards lead to high performance

The **EBAUI** enables ETHERNET segments to be connected directly to a switch through the use of a transceiver. This card is therefore optimally suitable for segmenting existing yellow cable structures or integrating them into structured cabling installations.

Boards are also available for single-mode fibre optic cable. Two different versions are offered for a diversity of use. The **EBSM-BFOC** with 12 dB link budget supports distances of up to 14 kilometres; the power version **EBSN-BFOC** with 24 dB link budget bridges up to 40 km. These cards are suitable for establishing full-duplex connections for coupling widely dispersed networks.

- Single-mode fibres allow bridging of distances up to 40 km

| Product                 | Order No.   |
|-------------------------|---|
| <b>EBAUI</b>            | <b>943 242-002</b>                                  |
| Interfaces              | 1 Port based on IEEE 802.3, AUI with AUI connection |
| Bridgeable Distance     | 50 m with transceiver cable                         |
| Displays                | Power, Data, Full-Duplex, Collisions                |
| Mechanical construction | 6TE Plug-In Module                                  |
| - Dimensions W x H x D  | 30 x 128 x 255 mm                                   |
| - Weight                | approx. 250 g                                       |
| - Operating Temperature | 0 °C to + 50 °C                                     |



EBAUI

| Product                 | Order No.   |
|-------------------------|---|
| <b>EBSM-BFOC</b>        | <b>943 244-022</b>  |
| Interfaces              | 1 Port based on IEEE 802.3 with BFOC connector                |
| Bridgeable Distance     | Up to 14 km with 9/125 or 10/125µm with ca. 12 dB Link Budget |
| Displays                | Link Status, Data, Full-Duplex, Collisions                    |
| Mechanical construction | 6TE Plug-In Module  |
| - Dimensions W x H x D  | 30 x 128 x 255 mm   |
| - Weight                | approx. 250 g   |
| - Operating Temperature | 0 °C to + 50 °C   |



EBSM

| Product                 | Order No.   |
|-------------------------|---|
| <b>EBSM-P-BFOC</b>      | <b>943 244-122</b>  |
| Interfaces              | 1 Port based on IEEE 802.3 with BFOC connectors                   |
| Bridgeable Distance     | Up to 42 km with 9/125 µm or 10/125 µm with ca. 24 dB Link Budget |
| Displays                | Link Status, Data, Full-Duplex, Collisions                        |
| Mechanical construction | 6TE Plug-In Module  |
| - Dimensions W x H x D  | 30 x 128 x 255 mm   |
| - Weight                | approx. 250 g   |
| - Operating Temperature | 0 °C to + 50 °C   |



EBSM-P

The **Multimode Interface Card** **EBMM-BFOC** conforms to the standard IEEE 802.3 10BASE-FL/FOIRL. BFOC and FSMA connections are supported. A typical application is to connect floors of a building to a centrally-located switch. This allows you to improve operating performance by carrying out network segmentation from a central location.

You can attach 10BASE-T compliant ports to the **EBTP-RJ45**. This facilitates connection to existing hub systems or to terminals using twisted pairs. All cards contain extensive display functions. Status messages and error functions can be read directly from the LED matrix.

| Product                 | Order-No..   |
|-------------------------|--|
| <b>EBMM-BFOC</b>        | <b>943 243-022</b>   |
| Interfaces              | 1 Port based on IEEE 802.3<br>10BASE-FL with BFOC connector  |
| Bridgeable Distance     | Up to 4000 m with 50/125 $\mu$ m<br>with 18 dB Link Budget, up to<br>4500 m with 62.5/125 $\mu$ m with ca.<br>dB Link Budget |
| Displays                | Link Status, Data, Full-Duplex,<br>Collisions  |
| Mechanical construction | 6TE Plug-In Module   |
| - Dimensions W x H x D  | 30 x 128 x 255 mm  |
| - Weight                | approx. 250 g  |
| - Operating Temperature | 0 °C to + 50 °C  |

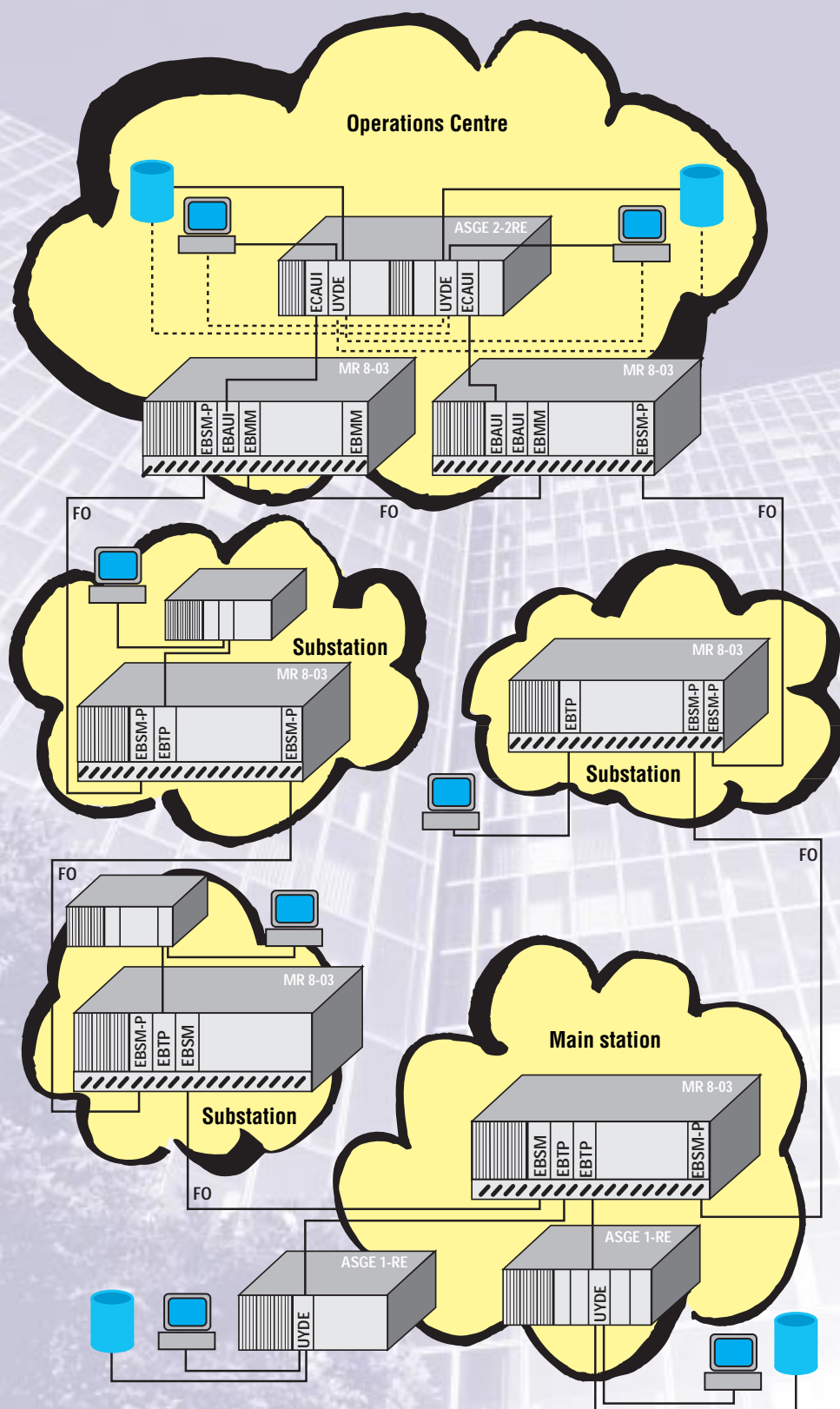


EBMM-BFOC

| Product                 | Order-No..   |
|-------------------------|--|
| <b>EBTP-RJ45</b>        | <b>943 356-002</b>   |
| Interfaces              | 1 Port based on IEEE 802.3<br>10BASE-T with RJ45 connector |
| Bridgeable Distance     | 100 m  |
| Displays                | Link Status, Data, Full-Duplex,<br>Collisions              |
| Mechanical construction | 6TE-Insert module  |
| - Dimensions W x H x D  | 30 x 128 x 255 mm  |
| - Weight                | ca. 250 g  |
| - Operating Temperature | 0 °C to + 50 °C  |



EBTP-RJ45



Use of MR 8-03 in operations management:

- Ring-shaped connection of operations management locations using MR 8-03
- Connection of large distances of up to 40 km using fibre-optic single-mode links
- Attachment of master computer, servers and PCs over hubs to the MR 8-03



| Product                                    | Order No.   |
|--|-------------|
| Manual for MultiLAN-Switch German + MR-SW  | 943 309-001 |
| Manual for MultiLAN-Switch English + MR-SW | 943 309-011 |

|   |             |
|---|-------------|
| <p>CD-ROM Manuals in German and English includes the following manuals in Acrobat Reader Format</p> <ul style="list-style-type: none"> <li>- Manual for Advanced LAN Switch Release 1.5</li> <li>- Manual for ETHERNET Version 3.1</li> <li>- Manual for Management MIKE Release 3.2</li> <li>- Manual for Management MultiMIKE Release 1.2</li> <li>- Manual for FDDI Version 2.0</li> <li>- Manual for TOKEN RING Version 1.1</li> <li>- Manual for Bridge/Router Plug-in module ERISDN</li> <li>- Manual for FDDI/ETHERNET Switch/Router Plug-in module Version 1.0</li> <li>- Manual for Management FCMA Release 3.0</li> <li>- Manual for MultiLAN Switch Release 2.1</li> <li>- User Guide for HiWay Fast ETHERNET and ETHERNET/Fast ETHERNET Workgroup Switches</li> <li>- Installation and Configuration Guide for ATM Uplink Module</li> <li>- Installation and Configuration Guide for FDDI-DAS Uplink Module</li> <li>- Users Manual for HiWay ETHERNET Workgroup Hub</li> </ul> | 943 590-001 |
|---|-------------|

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