The DRAGON MACH4x00 routers enable you to build secure, high speed network backbones using devices which were designed from day one to meet the specific requirements of modern OT networks.

- **Architect your precise network topology** with the DRAGON MACH4x00 switches and routers
- **Match your bandwidth requirements**, with dual speed 2.5 Gigabit and 10 Gigabit uplink ports
- **Benefit from high network availability** through the use of hot swappable power supplies and fans
- **Create resilient networks** using coherent industrial redundancy protocols from the network edge to its core
- **Implement secure infrastructure** using the extensive security functions included in the Hirschmann Operating System

**Benefits at a Glance**

**Hardware**
- Assured future bandwidth with 10 Gigabit uplink ports
- Subsequent network expansion through modular design
- Maximum uptime using hot swap power supplies
- Spontaneous maintenance of hot swap fans
- Any network topology using copper and SFP port cards

**Software**
- Proactive threat management through extensive security functionality
- Seamless network redundancy via edge to core protocols
- Accelerated deployment based on customized factory default
- Reduced cost of ownership with free of charge software updates
- Product developed securely according to IEC 62443-4-1

**Management**
- Intuitive configuration through a graphical user interface
- Rapid deployment using command line scripting
- High operational visibility with comprehensive SNMP management
- Integration into control systems via industrial communication protocols
- Effortless device replacement through removable memory cards

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**Hirschmann Operating System HiOS**
The HiOS Operating System has been developed by Hirschmann based on more than twenty years of experience with industrial network configuration and operation. It provides a single operating system for a complete range of hardware platforms, thereby ensuring functional compatibility across all network devices.

**Industrial HiVision Network Management Software**
Industrial HiVision has been developed by Hirschmann to facilitate the configuration and supervision of industrial networks. This highly graphical software provides a real time view of your network health, thereby increasing operational availability and accelerating fault finding.
The Industrial Router for OT Networks

Data density is increasing rapidly and industrial backbone networks need higher bandwidths to efficiently transport large amounts of data from the field level to the control room and beyond. With up to eight ports that can support both 2.5 Gigabit or 10 Gigabit, the DRAGON MACH4x00 meets your bandwidth requirements both now and in the future. Two internal redundant power supplies increase device availability, without taking up additional rack space. Hot swap fans can be exchanged at your convenience.

Typical IT routers must provide a large number of software functions to support many generic network deployments. The DRAGON MACH4x00 was designed from the start as an industrial network router. Its focused feature set not only includes standard switching and routing protocols, but also specialized industrial functionality. This includes ring redundancy mechanisms, as well as industrial communication protocols such as EtherNet/IP, Profinet, and IEC 61850.

Applications

The DRAGON MACH4x00 series is designed for applications that require large amounts of bandwidth. It also provides a high-performance demarcation point between IT and OT networks. With a maximum available PoE power budget of 1200W, the system is ideal for demanding applications where high PoE power is required.

Markets

The DRAGON MACH4x00 series is well suited for transportation scenarios that require high network uptime and wire-speed routing. These include mass transit systems, railway and train stations, airports and rail-rolling stock. Oil and gas and PT&D applications will also benefit from the industrial functionality. The evolution of these products has been influenced by input from customers in the consumer packaged goods and automotive industries.
### Technical Information - Basic Unit

#### Product Description Basic Units

<table>
<thead>
<tr>
<th>Type</th>
<th>DRAGON MACH4000-52G</th>
<th>DRAGON MACH4000-48G+4X</th>
<th>DRAGON MACH4500-80G+8X</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Full Gigabit Ethernet Backbone Switch with internal redundant power supply, modular design and advanced Layer 2 and Layer 3 HiOS features</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Port Type and Quantity</strong></td>
<td>Ports in total up to 52 Basic unit: 4 x 1 GE SFP, expandable with four media modules 10 or 12 FE/GE ports each</td>
<td>Ports in total up to 52 Basic unit: 4 x 1/2.5/10 GE SFP+, expandable with four media modules 10 or 12 FE/GE ports each</td>
<td>Ports in total up to 88 Basic unit: 8 x 1/2.5/10 GE SFP+ plus 32 x FE/GE ports, expandable with four media modules 10 or 12 FE/GE ports each</td>
</tr>
</tbody>
</table>

#### More Interfaces

| **V.24 Interface** | 1 x RJ45 socket |
| **SD Card Slot** | 1 x to connect auto-configuration adapter ACA31 (SD) |
| **USB Slot** | 1 x to connect auto-configuration adapter ACA22 (USB) |

#### Power Requirements

| **Out-of-Band Management** | 1 x RJ45 socket |
| **Operating Voltage** | PSU unit input: 100-240 V AC; switch can be operated with either 1 or 2 field-replaceable PSU units (to be ordered separately) |
| **Power Consumption** | Max. 200 W |

#### Mechanical Construction

| **Dimensions (WxHxD)** | 480 mm x 88 mm x 445 mm |
| **Weight** | 7.3 kg 7.3 kg 7.8 kg |
| **Protection Class** | IP20 |

#### Software

**Supported HiOS Software Levels**

- Layer 2 Advanced (L2A) or Layer 3 Advanced (L3A) with Unicast or Multicast Routing

#### Software Layer 2 Advanced

| **Management** | Dual Software Image Support, TFTP, SFTP, SCP, LLDP (802.1AB), LLDP-MED, SSHv2, V.24, HTTP, HTTPS, Traps, SNMP v1/v2/v3, Telnet, DNS Client |
| **Diagnostics** | Management Address Conflict Detection, MAC Notification, Signal Contact, Device Status Indication, TCPDump, LEDs, Syslog, Persistent Logging on ACA, Email Notification, Port Monitoring with Auto-Disable, Link Flap Detection, Overload Detection, Duplex Mismatch Detection, Link Speed and Duplex Monitoring, RMON (1,2,3,9), Port Mirroring (1,3,8), Port Mirroring (1), Port Mirroring (1), RSPAN, SFLOW, VLAN Mirroring, Port Mirroring (1), System Information, Self-Tests on Cold Start, Copper Cable Test, SFP Management, Configuration Check Dialog, Switch Dump, Snapshot Configuration Feature |
| **Configuration** | BOOTP/DHCP Client with Auto-Configuration, DHCP Server: per Port, DHCP Server: Pools per VLAN, AutoConfiguration Adapter ACA31 (SD card), AutoConfiguration Adapter ACA21/22 (USB), HiDiscovery, DHCP Relay with Option 82, Command Line Interface (CLI), CLI Scripting, Full-featured MIB Support, Web-based Management, Context-sensitive Help |
## Software Layer 2 Advanced

<table>
<thead>
<tr>
<th>Redundancy</th>
<th>HIPER-Ring (Ring Switch), HIPER-Ring over Link Aggregation, Link Aggregation with LACP, Link Backup, Media Redundancy Protocol (MRP) (IEC62439-2), MRP over Link Aggregation, Redundant Network Coupling, Sub Ring Manager, RSTP 802.1D-2004 (IEC62439-1), MSTP (802.1Q), RSTP Guards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Profiles</td>
<td>EtherNet/IP Protocol, IEC61850 Protocol (MMS Server, Switch Model), ModbusTCP, PROFINET IO Protocol</td>
</tr>
<tr>
<td>Switching</td>
<td>Independent VLAN Learning, Fast Aging, Static Unicast/Multicast Address Entries, QoS / Port Prioritization (802.1D/p), TOS/DSCP Prioritization, Interface Trust Mode, CoS Queue Management, IP Ingress DiffServ Classification and Policing, IP Egress DiffServ Classification and Policing, Queue-Shaping / Max. Queue Bandwidth, Flow Control (802.3X), Egress Interface Shaping, Ingress Storm Protection, Jumbo Frames, VLAN (802.1Q), Protocol-based VLAN, VLAN Unaware Mode, GARP VLAN Registration Protocol (GVRP), Voice VLAN, MAC-based VLAN, IP subnet-based VLAN, GARP Multicast Registration Protocol (GMRP), IGMP Snooping/Querier per VLAN (v1/v2/v3), Unknown Multicast Filtering, Multiple VLAN Registration Protocol (MVRP), Multiple MAC Registration Protocol (MMRP), Multiple Registration Protocol (MRP)</td>
</tr>
<tr>
<td>Time Synchronization</td>
<td>SNTP Client, SNTP Server; DRAGON MACH4000-xx only: PTPv2 Transparent Clock two-step, PTPv2 Boundary Clock, Buffered Real Time</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Manual Cable Crossing, Port Power Down</td>
</tr>
</tbody>
</table>

## Software Layer 3 Advanced (additional features)

<table>
<thead>
<tr>
<th>Redundancy</th>
<th>VRRP, VRRP Tracking, HiVRRP (VRRP enhancements)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routing</td>
<td>Full Wire-Speed Routing, Port-based Router Interfaces, VLAN-based Router Interfaces, Loopback Interface, ICMP Filter, Net-directed Broadcasts, Static Unicast Routing, OSPFv2, RIP v1/v2, Equal Cost Multiple Path (ECMP), ICMP Router Discovery (IRDP), Proxy ARP, Static Route Tracking, IP/UDP Helper</td>
</tr>
<tr>
<td>Multicast Routing</td>
<td>IGMP v1/v2/v3, IGMP Proxy (Multicast Routing), DVMRP, PIM-DM (RFC3373), PIM-SM / SSM (RFC4601)</td>
</tr>
</tbody>
</table>

## Ambient Conditions

| Operating Temperature               | 0°C to 60°C |
| Storage Temperature                 | -40°C to 70°C |
| Rel. Humidity (non-condensing)      | 10% to 90% |

## Approvals

| Basic Standard                      | C-Tick, CE, EN61131 |
| Safety of Industrial Control Equipment | UL 61010-1 and UL 61010-2-201 |
| Safety of information technology equipment | EN 60950-1 |
| Transportation                      | EN 50121-4 |

## Scope of delivery

| Scope of delivery | Device, 1x Fan module D4K-AIR, 1x D4K-PSU-PANEL, 4x D4K-LC-PANEL, General safety instruction |

**NOTE:** These are the prominent technical specifications. For complete technical specifications visit: [www.belden.com](http://www.belden.com)
## Technical Information - Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Code</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Port Modules</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>942 155-001</td>
<td>D4K-12TP-RJ45</td>
<td>12 x FE/GE TX ports, field.replaceable</td>
</tr>
<tr>
<td>942 155-501</td>
<td>D4K-12SFP</td>
<td>12 x FE/GE SFP slots, field.replaceable</td>
</tr>
<tr>
<td>942 294-001</td>
<td>D4K-10TP-PoE</td>
<td>10 x FE/GE PoE+ ports; max. PoE power 300 W; PoE power supplied by an external PSU; field.replaceable</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>942 156-001</td>
<td>D4K-PSU-300W-HV</td>
<td>DRAGON MACH4x00 300W power supply, field.replaceable</td>
</tr>
<tr>
<td><strong>Others / Spare Parts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>942 157-001</td>
<td>D4K-AIR</td>
<td>DRAGON MACH4x00 fan unit, field.replaceable</td>
</tr>
<tr>
<td>942 222-001</td>
<td>D4K-LC-PANEL</td>
<td>Blanking plate for port module slot</td>
</tr>
<tr>
<td>942 222-002</td>
<td>D4K-PSU-PANEL</td>
<td>Blanking plate for PSU slot</td>
</tr>
</tbody>
</table>

## Optical Transceivers for DRAGON MACH4x00

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Code</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.5 Gigabit Ethernet SFP Transceivers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>942 162-001</td>
<td>M-SFP-2.5-MM/LC EEC</td>
<td>Multimode Fiber (MM) 50/125 µm 0 to 550 m, 850 nm; 4 dB link budget; OM3 fiber (3.5 dB/km, 2000 MHz&quot;km)</td>
</tr>
<tr>
<td>942 163-001</td>
<td>M-SFP-2.5-MM/LC EEC</td>
<td>Multimode Fiber (MM) 50/125 µm 0 to 400 m, 850 nm; 4 dB link budget; OM2 fiber (3.5 dB/km, 500 MHz&quot;km)</td>
</tr>
<tr>
<td>942 164-001</td>
<td>M-SFP-2.5-MM/LC EEC</td>
<td>Multimode Fiber (MM) 62.5/125 µm 0 to 170 m, 850 nm; 4 dB link budget; OM1 fiber (3.5 dB/km, 200 MHz&quot;km)</td>
</tr>
<tr>
<td><strong>10 Gigabit Ethernet SFP+ Transceivers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>942 210-001</td>
<td>M-SFP-10-SR/LC EEC</td>
<td>Multimode Fiber (MM) 50/125 µm 0 to 82 m, 850 nm; 8.1 dB link budget; OM3 fiber (3 dB/km, 2000 MHz&quot;km)</td>
</tr>
<tr>
<td>942 211-001</td>
<td>M-SFP-10-SR/LC EEC</td>
<td>Multimode Fiber (MM) 50/125 µm 0 to 300 m, 850 nm; 8.1 dB link budget; OM3 fiber (3 dB/km, 2000 MHz&quot;km)</td>
</tr>
<tr>
<td>942 212-001</td>
<td>M-SFP-10-SR/LC EEC</td>
<td>Multimode Fiber (MM) 50/125 µm 0 to 400 m, 850 nm; 8.1 dB link budget; OM4 fiber (3 dB/km, 4700 MHz&quot;km)</td>
</tr>
<tr>
<td>942 213-001</td>
<td>M-SFP-10-ZR/LC</td>
<td>Singlemode Fiber (SM) 9/125 µm 0 to 40 km, 1550 nm; 11 to 22 dB link budget; 0.25 dB/km</td>
</tr>
<tr>
<td><strong>10 Gigabit DAC cable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>942 280-001</td>
<td>SFP-10-DAC-05m</td>
<td>Passive 10 Gigabit DAC cable, 0.5 meter</td>
</tr>
<tr>
<td>942 280-002</td>
<td>SFP-10-DAC-1m</td>
<td>Passive 10 Gigabit DAC cable, 1 meter</td>
</tr>
<tr>
<td>942 280-003</td>
<td>SFP-10-DAC-2m</td>
<td>Passive 10 Gigabit DAC cable, 2 meter</td>
</tr>
<tr>
<td>942 280-004</td>
<td>SFP-10-DAC-4m</td>
<td>Passive 10 Gigabit DAC cable, 4 meter</td>
</tr>
</tbody>
</table>

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