






# DRAGON MACH4x00

## Layer 3 Backbone Switches

With these powerful Layer 3 switches, you can build flexible, redundant and secure backbone networks with a high bandwidth (up to 10 Gigabit).

-  Progressively transition **from 1 Gbit/s to 2.5 Gbit/s to 10 Gbit/s speeds.**
-  Build a redundant backbone network for **maximum availability.**
-  **Redundant and hot-swappable internal power supply** for maximum device uptime.

### Key Features

- Up to eight 10 Gigabit uplink ports, which can also be used as 2.5 Gigabit ports through a simple SFP+ transceiver exchange
- Four interface slots for the 12 x 1 Gigabit TX or SFP port modules or the 10 x 1 Gigabit PoE+ port module
- Two hot-swappable internal redundant power supplies
- Hot-swappable fan unit
- Multiple management interfaces, including USB, secure digital card and console port as well as a HTML5 web interface
- Extensive network security features and backward compatibility using Hirschmann's best-in-class operating system HiOS



The Hirschmann DRAGON MACH4x00 series offers an innovative, technically-advanced architecture that delivers superior bandwidth for connecting OT and IT networks.

**Be certain.  
Belden.**



### Powerful Performance yet Simple to Use

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. The DRAGON MACH4x00 series offers superior bandwidth capabilities to meet increasing data demands. With up to eight ports that can be set-up for 2.5 Gigabit or 10 Gigabit, redundant power supplies and various management interfaces, engineers will be able to handle current and future bandwidth needs without compromising on availability.

The extended port flexibility offered by DRAGON MACH4x00 series allows engineers to progressively transition the network rather than go directly from 1 Gigabit ports to 10 Gigabit ports. No external power chassis is needed, which means engineers can use two internal redundant power supplies to reduce costs without compromising performance.

The new switches offer Hirschmann's operating system HiOS with Layer 2 and optionally also Layer 3 functions, giving you the ability to choose the software features at time of order.



### Applications

The DRAGON MACH4x00 series is best suited for applications that require high bandwidth and reliable data transfer. In addition, with a maximum available PoE power budget of 1.2 kW, the system is ideal for demanding PoE applications where high PoE power is required. Customers looking to accomplish the following are prime candidates for the new DRAGON MACH4x00 switches:

- Connect IT and OT networks and transfer more data from the field level to the control room
- Begin a progressive transition to 10 Gigabit speeds
- Rely on fully redundant capabilities for data transmission and power input
- Provide PoE power to many end devices which consume a lot of power such as cameras, wireless access points or IP telephones



### Markets

The DRAGON MACH4x00 series is best suited for transportation scenarios that require superior performance and availability, including mass transit systems, railway and train stations, airports and rail-rolling stock. Oil and gas and power transmission and distribution applications will also benefit from this new device, in addition to any manufacturing scenario, like automotive industries.

The DRAGON MACH4x00 series allows engineers to transfer larger quantities of data faster without compromising network availability or performance.



## Technical Information - Basic Unit

Product Description Basic Units			
Type	DRAGON MACH4000-52G	DRAGON MACH4000-48G+4X	DRAGON MACH4500-80G+8X
Description	Full Gigabit Ethernet Backbone Switch with internal redundant power supply, modular design and advanced Layer 2 and Layer 3 HiOS features		
Port Type and Quantity	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	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	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
Order No.	942 318-001 – DRAGON MACH4000-52G-L2A 942 318-002 – DRAGON MACH4000-52G-L3A-UR 942 318-003 – DRAGON MACH4000-52G-L3A-MR	942 154-001 – DRAGON MACH4000-48G+4X-L2A 942 154-002 – DRAGON MACH4000-48G+4X-L3A-UR 942 154-003 – DRAGON MACH4000-48G+4X-L3A-MR	942 153-001 – DRAGON MACH4500-80G+8X-L2A 942 153-002 – DRAGON MACH4500-80G+8X-L3A-UR 942 153-003 – DRAGON MACH4500-80G+8X-L3A-MR
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 1:1, Port Mirroring 8:1, Port Mirroring N:1, RSPAN, SFLOW, VLAN Mirroring, Port Mirroring N:2, 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		
Security	MAC-based Port Security, Port-based Access Control with 802.1X, Guest/unauthenticated VLAN, Integrated Authentication Server (IAS), RADIUS VLAN Assignment, RADIUS Policy Assignment, Multi-Client Authentication per Port, MAC Authentication Bypass, DHCP Snooping, IP Source Guard, Dynamic ARP Inspection, Denial-of-Service Prevention, LDAP, Ingress MAC-based ACL, Egress MAC-based ACL, Ingress IPv4-based ACL, Egress IPv4-based ACL, Time-based ACL, VLAN-based ACL, Ingress VLAN-based ACL, Egress VLAN-based ACL, ACL Flow-based Limiting, Access to Management restricted by VLAN, Device Security Indication, Audit Trail, CLI Logging, HTTPS Certificate Management, Restricted Management Access, Appropriate Use Banner, Configurable Password Policy, Configurable Number of Login Attempts, SNMP Logging, Multiple Privilege Levels, Local User Management, Remote Authentication via RADIUS, User Account Locking		
Redundancy	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		
Industrial Profiles	EtherNet/IP Protocol, IEC61850 Protocol (MMS Server, Switch Model), ModbusTCP, PROFINET IO Protocol		
Switching	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)		
Time Synchronization	SNTP Client, SNTP Server; DRAGON MACH4000-xx only: PTPv2 Transparent Clock two-step, PTPv2 Boundary Clock, Buffered Real Time		
Miscellaneous	Manual Cable Crossing, Port Power Down		
Software Layer 3 Advanced (additional features)			
Redundancy	VRRP, VRRP Tracking, HiVRRP (VRRP enhancements)		
Routing	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		
Multicast Routing	IGMP v1/v2/v3, IGMP Proxy (Multicast Routing), DVMRP, PIM-DM (RFC3973), PIM-SM / SSM (RFC4601)		
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.hirschmann.com](http://www.hirschmann.com)



## Technical Information - Accessories

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

## Optical Transceivers for DRAGON MACH4x00

Part Number	Product Code	Product Description
<b>2.5 Gigabit Ethernet SFP Transceivers</b>		
942 162-001	M-SFP-2.5-MM/LC EEC	Multimode Fiber (MM) 50/125 $\mu$ m 0 to 550 m, 850 nm; 4 dB link budget; OM3 fiber (3.5 dB/km, 2000 MHz*km)
		Multimode Fiber (MM) 50/125 $\mu$ m 0 to 400 m, 850 nm; 4 dB link budget; OM2 fiber (3.5 dB/km, 500 MHz*km)
		Multimode Fiber (MM) 62.5/125 $\mu$ m 0 to 170 m, 850 nm; 4 dB link budget; OM1 fiber (3.5 dB/km, 200 MHz*km)
942 163-001	M-SFP-2.5-SM-/LC EEC	Singlemode Fiber (SM) 9/125 $\mu$ m 0 to 5 km, 1310 nm; 8.5 dB link budget; 0.55 dB/km; (GR-253 CORE)
942 164-001	M-SFP-2.5-SM/LC EEC	Singlemode Fiber (SM) 9/125 $\mu$ m 0 to 20 km, 1310 nm; 13 dB link budget; 0.55 dB/km; (GR-253 CORE)
942 165-001	M-SFP-2.5-SM+/LC EEC	Singlemode Fiber (SM) 9/125 $\mu$ m 21 to 45 km, 1310 nm; 12 to 25 dB link budget; 0.55 dB/km; (GR-253 CORE)
942 220-001	M-SFP-2.5-LH/LC	Singlemode Fiber (SM) 9/125 $\mu$ m 0 to 80 km, 1551 nm; 14 to 28 dB link budget; 0.25 dB/km
<b>10 Gigabit Ethernet SFP+ Transceivers</b>		
942 210-001	M-SFP-10-SR/LC EEC	Multimode Fiber (MM) 50/125 $\mu$ m 0 to 82 m, 850 nm; 8.1 dB link budget; OM2 fiber (3 dB/km, 500 MHz*km)
		Multimode Fiber (MM) 50/125 $\mu$ m 0 to 300 m, 850 nm; 8.1 dB link budget; OM3 fiber (3 dB/km, 2000 MHz*km)
		Multimode Fiber (MM) 50/125 $\mu$ m 0 to 400 m, 850 nm; 8.1 dB link budget; OM4 fiber (3 dB/km, 4700 MHz*km)
		Multimode Fiber (MM) 62.5/125 $\mu$ m 0 to 33 m, 850 nm; 8.1 dB link budget; OM1 fiber (3.2 dB/km, 200 MHz*km)
942 211-001	M-SFP-10-LR/LC EEC	Singlemode Fiber (SM) 9/125 $\mu$ m 0 to 10 km, 1310 nm; 7.4 dB link budget; 0.4 dB/km
942 212-001	M-SFP-10-ER/LC EEC	Singlemode Fiber (SM) 9/125 $\mu$ m 10 to 40 km, 1550 nm; 3 to 15 dB link budget; 0.25 dB/km
942 213-001	M-SFP-10-ZR/LC	Singlemode Fiber (SM) 9/125 $\mu$ m 40 to 80 km, 1550 nm; 11 to 22 dB link budget; 0.25 dB/km
<b>10 Gigabit DAC cable</b>		
942 280-001	SFP-10-DAC-05m	Passive 10 Gigabit DAC cable, 0.5 meter
942 280-002	SFP-10-DAC-1m	Passive 10 Gigabit DAC cable, 1 meter
942 280-003	SFP-10-DAC-2m	Passive 10 Gigabit DAC cable, 2 meter
942 280-004	SFP-10-DAC-4m	Passive 10 Gigabit DAC cable, 4 meter