DRAGON MACH4000
Layer 3 Backbone Switch

With this powerful Layer 3 switch, 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

- Four 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 port modules, available in both copper and fiber
- 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 MACH4000 offers an innovative, technically-advanced architecture that delivers superior bandwidth for connecting OT and IT networks.

**Be certain.
Belden.**

Your Benefits

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 MACH4000 offers superior bandwidth capabilities to meet increasing data demands. With four 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 MACH4000 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 MACH4000 is best suited for applications that require high bandwidth and reliable data transfer. Customers looking to accomplish the following are prime candidates for the new DRAGON MACH4000:

- 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

Markets

The DRAGON MACH4000 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 MACH4000 allows engineers to transfer larger quantities of data faster without compromising network availability or performance.

Technical Information

Product Description Basic Units	
Type	DRAGON MACH4000
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 fixed ports: 4 x 1/2.5/10 GE SFP+ Modular: 48 x FE/GE ports expandable with four media module slots; 12 FE/GE ports per module
Number of Fiber Ports	Up to 52 fiber ports: 48 x FE/GE plus 4 x 1/2.5/10 GE
Order No.	**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
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	
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 seperately)
Power Consumption	200 W
Mechanical Construction	
Mounting	19" Control Cabinet
Protection Class	IP20
Dimensions (WxHxD)	480 mm x 88 mm x 445 mm
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	PTPv2 Transparent Clock two-step, PTPv2 Boundary Clock, Buffered Real Time Clock, SNTP Client, SNTP Server
Miscellaneous	Manual Cable Crossing, Port Power Down
Software Layer 3 Advanced in Addition	
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)
Power Supply (ordered separately)	
Order-No.	**942 156-001**
D4K-PSU-300W-HV	High Voltage 300 W Power Supply Unit, field-replaceable
Media Modules (ordered separately)	
Order-No.	**942 155-001**
D4K-12TP-RJ45	DRAGON MACH4x00 port module with 12 x FE/GE TX ports; field-replaceable
Order-No.	**942 155-501**
D4K-12SFP	DRAGON MACH4x00 port module with 12 x FE/GE SFP slots; field-replaceable
Accessories (ordered separately)	
Order-No.	**942 157-001**
D4K-AIR	DRAGON MACH4x00 fan unit; hot-swappable; 5 load sharing inbuilt fans
Order-No.	**942 222-001**
D4K-LC-PANEL	Blind panel to cover one empty line card slot if module is not used
Order-No.	**942 222-002**
D4K-PSU-PANEL	Blind panel to cover redundant power supply unit slot if second power supply unit is not used

Technical Information

Common Technical Data	
Type	**Basic Units, Media Modules and Power Supplies**
Ambient Conditions	
Operating Temperature	0°C to 60°C
Storage Temperature	-40°C to 70°C
Rel. Humidity (non-condensing)	10% to 90%
Approvals Configurable	
Basic Standard	C-Tick, CE, EN61131
Safety of Industrial Control Equipment	UL 61010-1 and UL 61010-2-201 (pending)
Safety of information technology equipment	EN 60950-1
Transportation	EN 50121-4
Accessories	
Device Replacement and Logging	ACA22-USB EEC - Order No. 942 124-001, ACA31 - Order No. 942 074-001

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com

Product Description 2.5 Gigabit Ethernet SFP and 10 Gigabit Ethernet SFP+ Transceivers	
Type	**M-SFP-2.5-MM/LC EEC**
Order No.	**942 162-001**
Multimode Fiber (MM) 50/125 µm	0 to 550 m, 850 nm; 4 dB link budget; OM3 fiber (3.5 dB/km, 2000 MHz*km)
Multimode Fiber (MM) 50/125 µm	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 µm	0 to 170 m, 850 nm; 4 dB link budget; OM1 fiber (3.5 dB/km, 200 MHz*km)
Type	**M-SFP-2.5-SM-/LC EEC**
Order No.	**942 163-001**
Singlemode Fiber (SM) 9/125 µm	0 to 5 km, 1310 nm; 8.5 dB link budget; 0.55 dB/km; (GR-253 CORE)
Type	**M-SFP-2.5-SM/LC EEC**
Order No.	**942 164-001**
Singlemode Fiber (SM) 9/125 µm	0 to 20 km, 1310 nm; 13 dB link budget; 0.55 dB/km; (GR-253 CORE)
Type	**M-SFP-2.5-SM+/LC EEC**
Order No.	**942 165-001**
Singlemode Fiber (SM) 9/125 µm	21 to 45 km, 1310 nm; 12 to 25 dB link budget; 0.55 dB/km; (GR-253 CORE)
Type	**M-SFP-2.5-LH/LC**
Order No.	**942 220-001**
Singlemode-Faser (SM) 9/125 µm	0 to 80 km, 1551 nm; 14 to 28 dB link budget; 0.25 dB/km
Type	**M-SFP-10-SR/LC EEC**
Order No.	**942 210-001**
Multimode Fiber (MM) 50/125 µm	0 to 82 m, 850 nm; 8.1 dB link budget; OM2 fiber (3 dB/km, 500 MHz*km)
Multimode Fiber (MM) 50/125 µm	0 to 300 m, 850 nm; 8.1 dB link budget; OM3 fiber (3 dB/km, 2000 MHz*km)
Multimode Fiber (MM) 50/125 µm	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 µm	0 to 33 m, 850 nm; 8.1 dB link budget; OM1 fiber (3.2 dB/km, 200 MHz*km)
Type	**M-SFP-10-LR/LC EEC**
Order No.	**942 211-001**
Singlemode Fiber (SM) 9/125 µm	0 to 10 km, 1310 nm; 7.4 dB link budget; 0.4 dB/km
Type	**M-SFP-10-ER/LC EEC**
Order No.	**942 212-001**
Singlemode Fiber (SM) 9/125 µm	10 to 40 km, 1550 nm; 3 to 15 dB link budget; 0.25 dB/km
Type	**M-SFP-10-ZR/LC**
Order No.	**942 213-001**
Singlemode Fiber (SM) 9/125 µm	40 to 80 km, 1550 nm; 11 to 22 dB link budget; 0.25 dB/km

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