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New Product Bulletin

NP 311

Belden® Introduces the Hirschmann™ MACH1040 Full Gigabit Switch

The MACH1040 Full Gigabit Switch for high operational safety and network availability in Power Plants and Transformer Stations.



The MACH1040 Full Gigabit Ethernet Switch is Ideally Suited for Electrical Substation Automation as well as a Multitude of Other Harsh, Mission-Critical Applications



The new MACH 1040 Full Gigabit Ethernet Switch is an IP30 Layer-2 switch with 16 Gigabit Ethernet combo ports (10/100/1000 TX (RJ45) or 100/1000 FX (SFP)). All ports support version 2 of Precision Time Protocol in accordance with IEEE 1588 V2 and has optional Power over Ethernet (IEEE 802.3af). Software is currently under development to enable this switch to be used as a router, providing an upgrade path for future network needs.

MACH1040 Full Gigabit Ethernet Switch Characteristics

Designed for assembly in 19" cabinets, the fan-less MACH1040 uses the latest energy-saving chip technology. Electrical Substation Automation as well as a Multitude of Other Harsh, Mission-Critical Applications. Its rugged metal housing measures 448 by 44 by 310 mm in width, height and depth. Rapid deployment is ensured through the 10-second boot time and the compatibility with the ACA 21-USB - a configuration storage device that provides multi-device configuration and device replacement ease.

Alarm contacts are available for providing detailed information which can be displayed by means of a standard web browser. Additional management functions include Command Line Interface, Management Information Base, Telnet, HTTP, TFTP as well as SFP Management. In addition, an SNMP interface permits the use of network management software, such as HiVision and HiDiscovery.

Media redundancy mechanisms procedures, e.g. Fast HIPER Ring, MRP, Trunking, Link Aggregation and Rapid Spanning Tree (RSTP), dual power inputs and quality components provide for high network availability. Security mechanisms include access control according to IEEE 802.1x, IP and MAC port security as well as SNMP V3 and SSH.

Future-proof, high performance solution for the electrical utilities and other high-availability demanding applications.

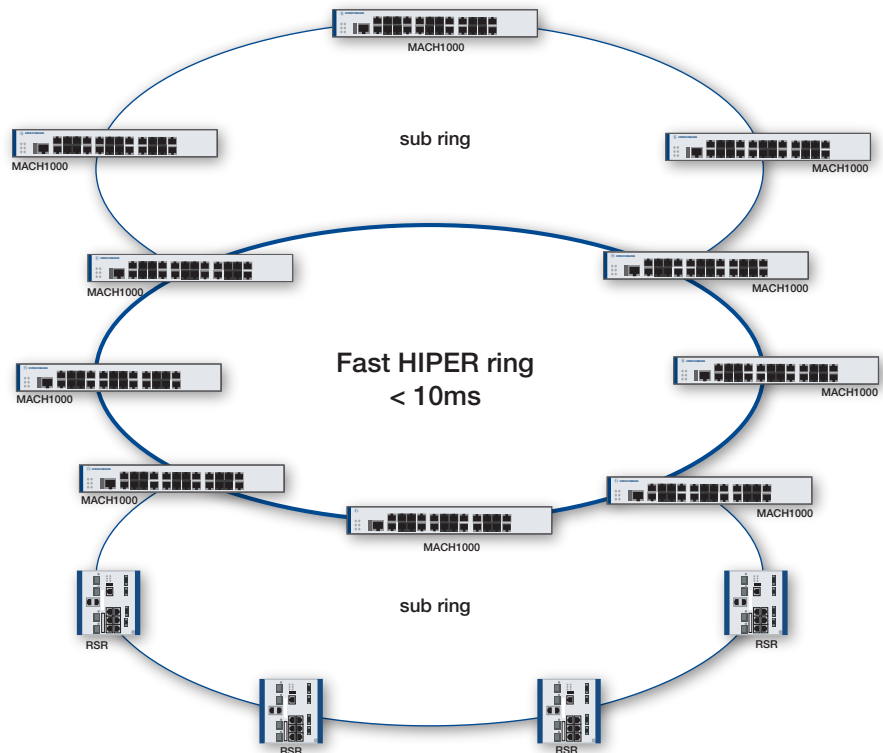


Ideally Suited for Power Transmission and Distribution Systems

An operating temperature range of -40°C to $+70^{\circ}\text{C}$ and its high resistance to jarring, and extensive insusceptibility to electrical discharge and magnetic fields makes the MACH1040 an excellent fit for power transmission and distribution systems. Passive cooling (no fans) and a redundant power supply are added to ensure high operational safety while meeting the standards and approval requirements of IEC 61850, IEEE 1613, EN 50121-4, EN 50155, cUL 508, cUL 1604 and GL.

Product Features

- 16 GE ports with non-blocking architecture
- PTP IEEE 1588v2 on board, precision 30 ns
- Highest flexibility through 16 Gigabit RJ45/SFP combo ports
- Extensive software features
- Fastest ring recovery times
- Optional 4 PoE ports
- Sub-10 second boot time
- High operational safety through:
 - High vibration resistance
 - Immunity to RFI and EMI
 - Fanless cooling
 - Redundant power supply





Technical Data

Product Description	
Description	All-Gigabit , 19" rack-mount, managed Layer 2, fanless switch (professional firmware), with optional PoE and rear ports
Port type and quantity	16 Gigabit Ethernet RJ45/SFP Combo Ports (optionally rear-facing) TX Ports support 10/100/1000 BASE TX SFP slots support 100 Mbps or 1000 Mbps (Gigabit) SFPs
Additional Interfaces	
V.24 interface	1 x RJ11 socket
USB interface	1 x USB to connect auto-configuration adapter ACA 21-USB EEC
Network range – cascadability	
Line/Star topology	Any
Ring structure (HIPER ring)	100 (<0.3 sec reconfiguration time)
Fault recovery time	< 10 ms / < 40 ms / < 60 ms
Power Supply	
Operating voltage	24/36/48 VDC (18 – 60 V) or 120/250 VDC (77 – 320 V) and 110/230 VAC (90 – 265 V)
Software	
Management	Serial interface, web interface, SNMP v1/v2, HiVision, file transfer via HTTP/TFTP
Diagnostics	LEDs, log file, syslog, relay contact, RMON, port mirroring, Topology Discovery 802.1AB, cable tester (TX), address conflict detection, network error detection, SFP diagnostics (temperature, optical input/output power)
Configuration	Command line interface (CLI), TELNET, BootP, DHCP, DHCP Option 82, HiDiscovery, auto-configuration adapter (ACA 21-USB), integrated DHCP server, automatic invalid configuration undo
Security	Port security (IP and MAC), SNMP v3, SSH, VLAN, authentication (802.1x)
Redundancy	Fast HIPER ring, multiple rings, MRP, RSTP 802.1w, redundant network/ring coupling, link aggregation
Filter	QoS 7 classes, port priority (IEEE 802.1D/p), VLAN (IEEE 802.1Q), multicast (IGMP snooping/querier), unknown multicast detection, broadcast/unicast/multicast limiter, fast aging, GMRP IEEE 802.1D, flow control 802.3x
Synchronization	SNTP Server, PTP/IEEE 1588, v1/v2 hardware timestamp with accuracy of 30 ns
Ambient conditions	
Operating temperature range	0°C to +60°C or -40°C to +70°C IEC 60068-2-2 Dry Heat Test +85°C, 16 HoursEC)
Storage/Transportation temperature range	-40°C to +85°C)
PCB conformal coating	Optional
Relative humidity (non-condensing)	10% to 95% (non-condensing)
Approvals	
Safety for industrial control equipment	cUL 508 (pending)
Hazardous locations	cUL 1604 Class 1 Div 2 (pending)
Germanischer Lloyd	GL (pending)
Substation	IEEE61850-3, IEEE1613
Transport	NEMA TS2, EN50121-4, EN50155 (pending)



Ordering Information

1. Design	
MAR1040	Full GE-Switch
MAR1042	Full GE-Switch, PoE
MAR1140	Full GE-Switch, backside ports
MAR1142	Full GE-Switch, backside ports, PoE
2. Gigabit Ports	
4C4C4C4C9999	16 Ports GE combo ports
3. Temperature range	
S	0°C to +60°C
T	-40°C to +70°C
E	-40°C to +70°C with conformal coating
4. Power supply 1	
L	24/36/48 V/DC
M	110/250 VDC / 110/230 VAC
5. Power supply 2	
9	Empty
L	24/36/48 V/DC
M	110/250 VDC / 110/230 VAC
6. Approvals	
H	cUL508, cUL/1604 class 1 Div 2, GL, IEC 61850, IEEE1613, NEMA TS
7. Software	
P	Layer 2 Professional
R	Layer 3 (future release)

Always the Right Solution

Belden is the world's leading supplier of signal transmission solutions including cable, connectivity and active components for mission-critical applications ranging from industrial automation to data centers, broadcast studios, and aerospace. Belden offers an extensive portfolio of signal transmission solutions for information, control and field levels, which the company produces and markets under its proprietary Belden®, Hirschmann™ and Lumberg Automation™ brands.

We welcome the opportunity to speak with you about our extensive industry portfolio and Belden's worldwide service. Further information and technical data are available online at www.hirschmann-usa.com

You can also contact our sales team directly at **1-717-217-2299**.

Example

MAR1042	4C4C4C9999	E	L	M	H	P
1.	2.	3.	4.	5.	6.	7.

Belden® Competence Center

Get the complete economic business solution for your network. In addition to our proven product portfolio, Belden offers you a comprehensive range of multi-supplier network services. Whether it is consulting, training or support – the Belden® Competence Center provides a single source of services customized to your needs.

Regardless of the technology you are using, our experts will support you from network design to the optimization of system performance throughout the operational process. State-of-the-art manufacturing expertise, a global service network and fast access to external specialist ensure that you receive the best assistance possible. Bundle your individual service package, today!

