HIRSCHMANN IT

A **BELDEN** BRAND

Total Networking Solutions for IT/OT Convergence

Total networking solutions that can improve security, productivity and operational efficiency today, while laying the foundations for tomorrow's intelligent manufacturing opportunities.

Belden Total Networking Solutions

Belden combines the strength of Hirschmann & Hirschmann IT switches and security products as well as Belden Ethernet cables for comprehensive networking solutions for IT/OT convergence.

You can depend on us to keep your mission-critical systems running steady and securely.

Easy to implement, intelligent and secured IT/OT converged solutions for networks ranging from small to large size.

Belden IT/OT converged solutions

Belden has over 30 year's experiences on offering integrated network solutions for complex industrial facilities and systems. As the size of industrial facility network and demand for higher efficiency increase, the IT network is required to converge with industrial network. At the same time, lots of IT technologies, including big-data, AI, visual identity and robotics, keep pushing the industrial network evolution forward.

With Belden's strong R & D capability and experiences on network solutions, new IT networking and cyber security product portfolios with more powerful features, reliable architecture and flexible deployment are offered to cope with the trend of IT/OT convergence. These products will help customer achieve their goals of lower total cost ownership of network, higher production efficiency, and higher security of the network. What's more, these products and solutions can minimize system failure rate and offer more flexibility, which help simplify the system monitoring and management, thus reduce the total cost of ownership.

Our Synergy Ensures Continuous Performance

With the Hirschmann IT and Hirschmann product line additions to the Belden offering, our line of comprehensive networking solutions are uniquely positioned to provide the best network and communications infrastructure possible. Belden products and systems expertise mean that you can have a network for mission critical applications, in which ongoing operations are maintained without interruption and costly downtime in any environment, and at the same time for extreme large scale data transmission. Here are a few more good reasons why Belden is your best choice for IT/OT networking:

- We have the expertise to integrate your industrial and IT networks.
- We offer the broadest selection of products, for a complete, end-to-end network solution.
- Our sales and engineering professionals can audit, recommend/design, configure and assemble the products and systems to your specific requirements.
- Our global manufacturing, distribution and support network makes our products and services available to you globally.

Offering Comprehensive Service & Support

Belden recognizes that comprehensive know- how is necessary to ensure an optimized, homogenous solution. We also know that consultation, support and training requires more than just a general understanding of the products, technologies and market trends. It requires a solid understanding of the application and the ability to provide the type of support that is needed – when and where it is needed. It requires the 5 key service and support areas that are critical to success:

- Network design and cyber security consulting
- Training
- Technical support
- Professional Service
- System performance

Network Design and Cyber Security Consulting

Belden eliminates your design challenges because we understand the issues surrounding the design and operation of networks in IT/OT convergence situation and mission-critical environments. Our engineers are available to work with you to deliver high-availability networks that meet your enterprise-wide IT needs. Whether it's designing systems for Greenfield facilities, or integrating into existing IT environments, our highly-trained staff lifts the design burden from your shoulders to ours.

We will consult with you to develop a strategy or we will develop and implement your full design – either way our staff is available to you.

Training

Backed by years of meeting and exceeding the needs of a broad range of end-user applications, Belden is ideally suited to offer beginners and networking experts alike the opportunity to expand their understanding of mission-critical networks.

Belden has developed a series of training programs that are given by Belden-certified individuals – all experts in networking and cabling.

Technical Support

At Belden, our personnel are poised to assist our customers – ensuring maximum uptime and reliability. And with offices in North America, Asia and Europe, Belden can respond globally.

Professional Service

Belden provides professional services, especially in cyber security. Our engineers are always ready to make sure the projects are successfully delivered.

System Performance

If Belden designs it, we guarantee performance period. We are committed to ensuring world-class signal connectivity and to significantly improve your operational up-time. All Belden components are "designed" to deliver optimum performance: from cable, to connectors, to switches and routers. Based on this comprehensive product portfolio, we have the necessary industrial solutions DNA to deliver reliability.

For more information on our service and support offering, including our warranties, please go to the Belden web site at

www.belden.com to locate a Belden sales representative near you.

Hirschmann IT Mammuthus Switch and Router

Hirschmann IT, a Belden brand provides competitive Mammuthus switch and router products with rich feature set, high quality and high reliability, for IT/OT convergence and IT networking.

The Hirschmann IT High Performance and Multi-purpose switches portfolio set and standard for quality, reliability and service.

New member of Mammuthus product family - MTR router series

As a key element of IT/OT convergence Mammuthus product family has a new joiner - MTR series enterprise router. The MTR series router extend the convergence network to WAN. MTR series router and MTS series switches has the same outstanding software and hardware combined with Hirschmann concept with ITOT network, which is ideal for intelligent industrial network.

Flexible Redundancy Technology

Hirschmann IT Mammuthus (MTS) series switches support multiple link redundancy functions, including not only STP/RSTP/MSTP but also ERPS. ERPS is robust Ethernet redundancy protocol which can provide great convergence performance. ERPS can help to improve network stability during heavy traffic, it can also help to reduce wiring complexity without reducing network reliability.

All MTS switches support stacking which can merge up to 8 devices into one management plane. Switches are also designed to have highly reliable hardware architecture with redundant fans and PSUs*.

* MTS2600 series switch only has one fixed PSU.

Easy to Configure

Our managed switches are easy to configure with an integrated password controlled web interface, via SNMP or CLI (command line interface), providing secure remote configuration through the network. Configuration data and device Operating System can be saved and stored on an external flash-based configuration storage device, simplifying and automating commissioning and device replacement.

Security and Authentication

The Mammuthus series switches provide a full complement of port security features, including Dynamic Host Configuration Protocol (DHCP) snooping, dynamic ARP inspection (DAI), IP source guard, and media access control (MAC) limiting (per port and per VLAN), to defend against internal and external spoofing, man-in-the-middle and denial-of-service (DoS) attacks.

MTS series switches also provide user authentication based on AAA, port security, ACL and 802.1x. These features can help customer to manage their network in a more secured way.

Broad Product Line

The Mammuthus series switches have various interfaces including GE TX, SFP, SFP+ and QSFP, and the configuration varies from 1RU fixed switch to more than 6RUs modular switch. Software feature set varies from basic level, which includes full L2 switching feature, to advanced level, which supports many advanced L3 function such as MPLS and SDN. Thus, any requirements can be matched with a certain model without needless budget spending.

Persistent PoE

In IoT situation, continuous power supply may be expected in any cases. The Mammuthus series switches support PoE/PoE+ function, power supplying will not be interrupted during device rebooting.

Network Software

Monitoring and visualizing your network is made easy with the use of our Industrial HiVision network management software. Requiring little or no IT knowledge, Industrial HiVision allows users to monitor alarms, bandwidth utilization, and availability of networked devices – not just switches. Industrial HiVision allows the user to configure a single switch or multiple switches at the same time, significantly simplifying commissioning.

Technologies

Technology Topics on IT Networking

Hirschmann (IT) is one of the most highly experienced manufacturers of total networking solutions based on Industrial OT Ethernet and IT applications. As an expert in system components, accessories and unified management software with a global presence, we make available our comprehensive expertise to our clients

Power over Ethernet (PoE)

PoE allows to supply power to device such as an IP camera via the same twisted pair cable for data communications. The PoE ports support Power over Ethernet according to IEEE 802.3af delivering a maximum 15.4 Watts per port.

Power over Ethernet Plus (PoE+)

PoE+ is the further development of PoE according to the standard IEEE 802.3at supporting up to 30 Watt. While PoE requires two pairs of the twisted pair cables, PoE+ uses all 4 pairs to power end devices which require power above 15.4 Watts.

SDN Ready

SDN (Software Defined Network) is a forwarding architecture in modern IP core network. Centralized management and distributed forwarding give SDN capacities for supporting large scaling/high performance network, while keep micro-management in network maintenance.

IPv6

Although the next generation of the Internet Protocol, version 6, is rarely deployed in industrial environments, the latest generation of Hirschmann IT devices is able to server future customer demands for IPv6 in the same way like it is required today with IPv4.

Stack

Stacking is a common topological method which is used to provide better performance and more robust network architecture. This technology can seamlessly merge all the ports in different devices into a single management node, which can provide higher port density and better reliability. Specific bi-directional action monitoring technology can avoid the split-brain failure owing to link mistake and configuration mistake.

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Storm control

Data storm (unknown unicast, multicast or broadcast, aka UMB) is potential risk in network operation. In large 3-party inter-operation network, virtualization network or ring topology environment, UMB data storm can exhaust network resource rapidly once it occurs. Hardware based storm control can mitigate the impact of UMB storm in low level and does not affect network operation.

MPLS

MPLS (Multi-Protocol Label Switching) is scalable and protocol-independent. In an MPLS network, data packets are assigned labels. Packet-forwarding decisions are made solely on the contents of this label, without the need to examine the packet itself. This allows one to create end-to-end circuits across any type of transport medium, using any protocol. MTS support all standard MPLS IP model, for example L3VPN, L2VPN, MPLS multicast, and TE.

ERPS

ERPS (Ethernet Ring Protection Switching) is a kind of Ethernet ring network protection technologies. It is described in ITU-TG.8032 as an advanced open protocol of ring network. This protocol has the advantage of various ring network protection technologies such as EAPS, RPR, SDH, STP and so on. It can realize switchover down to 50ms under various working mode such as master-slave, load balance and so on.

Layer 3 - Wire-Speed Routing with Standardized Routing Protocols

The Layer-3 routing functionality in Hirschmann IT switches focusing on maximum performance and lowest latency. Layer-3 can help to split the broadcast domain and more complex security policies or routing policies can be deployed into network. Hirschmann IT switches contain varies standard routing protocols such as OSPF, BGP, ISIS and so forth*. Multicast features are also supported.
* depends on different software level

Hirschmann IT Dragonfly Enterprise Wi-Fi 6 Access Point

Hirschmann IT Dragonfly series Wi-Fi 6 certified access point is the last puzzle for the Hirschmann IT enterprise network solution.

Dragonfly Wi-Fi 6 access point has indoor and outdoor version. All models support 2.4GHz & 5GHz dual GE uplink, OFDMA, MU-MIMO and all sort of Wi-Fi 6 features that can deliver more capacity for bandwidth with less latency, which is ideal choice for your high-quality wireless requirement.

Featuring enhanced WLAN technology with RF Radio Dynamic Adjustment, a distributed control Wi-Fi architecture with unified access secure network admission control, built in application intelligence and analytics, making it ideal for enterprises wireless solution. All DAP models except DAP620 has integrated with BLE5/Zigbee (802.15.4), making it ideal for broad scope of IoT endpoints and applications.

Plug-and-Play Deployment

The DAP Series works in a fully redundant cluster architecture to provide simplified plug-and-play deployments. One single access point (AP) cluster is an autonomous system that consists of a group of APs and a virtual controller, which is performed by a selected access point for cluster management. One AP cluster supports up to 255APs

The access point cluster architecture ensures simplified and quick deployment. Once the first AP is configured using the configuration wizard, the remaining APs in the network will get online automatically with updated configuration. This ensures that the whole network is up and operational within a few minutes.

Network Management Platform deployment

All Drgonfly APs can be managed by DAC (Dragonfly Access Point Virtual Controller). APs is managed as one or more AP Groups (a logical grouping of one or more access points). The DAC is a visualized, user friendly and hardware free management platform. It supports WLAN management together with integrated authentication server which helps define authentication strategy and policy enforcement for Employees and Guest devices. The network administrator can obtain a comprehensive overview of all running applications on the network and apply adequate control to optimize the network performance for mission critical applications. DAC Management platform provides advanced options for RF Management, as well as WIDS/WIPS for intrusion detection and prevention.

Wi-Fi 6 (802.11ax) Features

Wi-Fi 6 (802.11ax) allows enterprises to deliver high performance wireless LAN services with increased throughput, enabling more clients in dense environments. Furthermore, it provides high power efficiency for Internet of Things (IoT) devices, while it remains fully backward compatible with existing 802.11 a/b/g/n/ac deployments. Some of the key features enabled on DAP series are:

Orthogonal frequency division multiple access (OFDMA) enables more clients to simultaneously operate in the same channel, therefore improved efficiency, latency, and throughput. OFDMA can simultaneously address multiple clients in both directions downlink (DL) and uplink (UL). OFDMA is extremely effective for lower latency applications with mass clients such as voice and video transmission.

Multi-user multiple input, multiple output (MU-MIMO) allows more data to be transferred at once and enables a single access point to handle a larger number of concurrent clients.

1024 quadrature amplitude modulation mode (1024-QAM)
boosting peak data-rates by as much as 25 %.

BSS Coloring improves spatial reuse in dense environments by providing a mechanism for color coding different overlapping BSS's, allowing more simultaneous transmissions.

Extended Range (ER) provides increased coverage in scenarios where receiving side encounters high path loss and channel delay spread, especially in outdoor environments.

Target wake time (TWT) improves power efficiency for Wi-Fi 6 devices. This capability lets client devices to sleep much longer, and wake up to less contention, extending the battery life of smart phones, IoT sensors, and other devices.

Hirschmann IT RAVEN Next Generation Fire Wall

Hirschmann IT RAVEN security products help Belden deliver total solution for compliance and security requirements in IT/OT converged network design.

RAVEN Security Products Commit to Provide Customers with a Secure and Trusted Networking Environment, Perfect Border Management Functions, and Predictable Behavior/Performance

RAVEN series products are important security solutions from Hirschmann IT product portfolio. They can help customers benefit from the evolution of IT/OT convergence and avoid as more risks as possible in this convergence trend.

Integration Protection

RAVEN series products (RAVEN Next Generation Firewalls and RAVEN Intrusion Detection Systems) are designed as part of the total security solution of Belden. They can co-work with Hirschmann EAGLE firewall products to offer a total cyber security solution in IT/OT convergence. Besides, by synchronizing with RAVEN EYE, RAVEN series products shares the same security updates, which helps implement end-to-end security strategy and also helps network administrators assess their security strategy with the same benchmark.

Comprehensive Inspection

From security design perspective, all security target need to be accomplished without being interfered by previous network design. To achieve this expectation, RAVEN NGFW and RAVEN IDS support multiple deployment modes to adapt to various network environment. RAVEN NGFW support L2/L3 deployment modes and RAVEN IDS support centralized/distributed deployment modes. These multiple deployment modes help RAVEN security products implement comprehensive inspections in all scenes.

Multi-Functional Report

Clear and clarified information visualization help network and security administrators understand what happened in their network and how to take correct action to defense/mitigate network attack. RAVEN security products provide advanced algorithms and dashboard to show security information in real time. Besides, RAVEN security products provide analysis report based on time, address, event and other multiple parameters. Combined with historical analysis data, it can clearly show the trend of security risks and help to evaluate the result of network security construction.

Virtualization and High Availability (HA)

RAVEN series products can build a reliable security solution to not only improve cyber protection but also avoid introducing additional risk into the network system. RAVEN NGFW supports virtual firewall (vFW) technology to provide flexibility in multi-context design. As for HA, this is the basic function included in all RAVEN security products. HA function eliminates the risk of device failure in single box and thus fundamentally improves the reliability when merging cyber security device into current network.

RAVEN EYE

RAVEN series products can get latest cyber security events from over 70 traffic flow sampling centers around the world. Combining these data with Hirschmann IT's security analysis, tracking and modeling database, any new network attack and security accidents around the world will be updated onto RAVEN EYE database within 6 hours.

RAVEN EYE is an intelligent analysis center which contains compressed behavior signature and profile information database. Through regular updates to RAVEN EYE, RAVEN NGFW and RAVEN IDS can identify the latest attacks and implicit risks.

Technologies

Technology Topics on Network Security

RAVEN security products are designed to provide comprehensive and reliable cyber security functions in IT/OT converged network. With Belden's 10-year network security experience, below functions can directly benefit customers and promote security strategy landing.

RAVEN EYE

RAVEN EYE is an intelligent analysis center which contains compressed behavior signature and profile information database. It can get latest cyber security events from over 70 traffic flow sampling centers around the world. By combining these collected data with RAVEN EYE security analysis, tracking and modeling database, any new network attack and security events around the world will be updated onto RAVEN EYE database within 6 hours. Through regular updates to the information base, RAVEN NGFW and RAVEN IDS can identify the latest network attacks and implicit risks.

L2/L3 Mode

RAVEN NGFW can work under Layer2 or Layer3 mode which provides flexibility during network design. It can serve as the network gateway in L3 mode or as a network bridge in L2 mode. According to the limitation in deployment environment, RAVEN NGFW can choose either L2 or L3 mode on demand or combine both modes in one chassis.

IPv6 Ready

Network address is now moving from IPv4 to IPv6. All security functions on RAVEN NGFW and IDS support IPv4/IPv6 dual stack, which ensures RAVEN products can fulfill the security requirements no matter in current networking environment or in future security design.

vFW

vFW is a feature that enable RAVEN NGFW to divide into multiple isolated virtual firewalls serving different security domains or security designs. RAVEN NGFW allows users to manage the resource of each vFW, which avoid the over subscription of resource during heavy traffic. vFW also balance the traffic between HA (High Availability) members under specific configuration.

HA (High Availability)

To cope with the risk of chassis failure, all RAVEN products support HA function. In RAVEN NGFW, HA function merge 2 firewalls into one cluster, and thus all traffic fingerprints, such as TCP status, ICMP/UDP timer, ALG sessions and VPN cookies, will be synchronized in both firewalls. Therefore, no new session is needed once a member of HA cluster failed. In RAVEN IDS, HA function helps to remove duplicate session and to ensure no security events will be missed during the failure of one chassis.

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Product, Hardware and Performance Matrix of MTS switches

Product Category	Product Code	Ports	PSU	Heat Radiation	Stackable
MTS2600 Series Switch	MTS2624-4X-B	24×FE/GE TX, 4×1/10G SFP+ slots	Fixed single power supply	Fixed fan	Yes
MTS2700 Series Switch	MTS2724-4X-FP-S	24×FE/GE POE/POE+, 4×1/10G SFP+ slots	2×Fixed redundant PSUs	Fixed fan	Yes
	MTS2724-6X-MP-E	24×FE/GE POE/POE+, 4×1/10G SFP+ slots, 1×extended media module slot for additional 2×1/10G SFP+ slot	2×Modular redundant PSUs	Fixed fan	Yes
	MTS2748-6X-MP-E	48×FE/GE POE/POE+, 4×1/10G SFP+ slots, 1×extended media module slot for additional 2×1/10G SFP+ slot	2×Modular redundant PSUs	Fixed fan	Yes
MTS2800 Series Switch	MTS2848TF-4X-E	32 x FE/GE TX, 16 x 100/1000M SFP slots, 4x 1/10G SFP+ slots	2×Fixed redundant PSUs	Fixed fan	Yes
	MTS2832TF-4X-E	24×10/100/1000M SFP slots, 8×FE/GE TX, 4×1/10G SFP+ slots	2 x Modular redundant PSUs	Fixed fan	Yes
	MTS2824F-4X-S	24×10/100/1000M SFP slots, 4×1/10G SFP+ slots	2×Fixed redundant PSUs	Fixed fan	Yes
	MTS2824-4X-S	24×FE/GE TX, 4×1/10G SFP+ slots	2×Fixed redundant PSUs	Fixed fan	Yes
	MTS2848-6X-S	48×FE/GE TX, 6×1/10G SFP+ slots	2×Fixed redundant PSU	Fixed fan	Yes
	MTS2824-6X-E	24×FE/GE TX, 6×1/10G SFP+ slots	2×Fixed redundant PSUs	Fixed fan	Yes
	MTS2848-6X-E	48×FE/GE TX, 6×1/10G SFP+ slots	2×Fixed redundant PSUs	Fixed fan	Yes
MTS2900 Series Switch	MTS2948X-6Q-A	48×1/10G SFP+ slots, 6×40G QSFP+ slots	2×Modular redundant PSUs	4×Modular fan tray	Yes
MTS8000 Series Switch	MTS8003-Chassis	Dual Engine, 3×media modules	4×Modular redundant PSUs	2×Modular fan tray	Yes
	MTS8006-Chassis	Dual Engine, 4×media modules 2×switch fabric modules	4×Modular redundant PSUs	2×Modular fan tray	Yes
	MTS8010-Chassis	Dual Engine, 8×media modules 2×switch fabric modules	4×Modular redundant PSUs	2×Modular fan tray	Yes

MTS Switches Software Functionality

Switching	Feature MTS2600-B Basic	MTS2700-S Standard	MTS2800-E Enhanced	MTS2900-A Advanced	MTS8000 Series Software
MAC limitation	●	●	●	●	●
Static MAC address entry	●	●	●	●	●
MAC blackhole	●	●	●	●	●
Static/Dynamic ARP	●	●	●	●	●
GARP	●	●	●	●	●
ARP proxy	●	●	●	●	●
VLAN (802.1Q)	●	●	●	●	●
Flow control(802.3x, 802.3p)	●	●	●	●	●
LAG	●	●	●	●	●
QinQ	●	●	●	●	●
Flexible QinQ	●	●	●	●	●
VLAN mapping	●	●	●	●	●
STP/RSTP/MSTP	●	●	●	●	●
GARP VLAN Registration Protocol (GVRP)	●	●	●	●	●
Super VLAN	●	●	●	●	●
Private VLAN	●	●	●	●	●
Voice VLAN	●	●	●	●	●
BPDU Tunnel	●	●	●	●	●
N:1/N:N port monitoring	●	●	●	●	●
SPAN	●	●	●	●	●
ERSPAN				●	●
Flow mirroring	●	●	●	●	●
ERPS	●	●	●		
UDLD	●	●	●	●	●
OAM	●	●	●	●	●
sFlow	●	●	●	●	●
MPLS				●	●
MPLS QoS				●	
MPLS L3VPN				●	●
VXLAN			●	●	●
EVPN			●	●	●
TRILL				●	●
Multicast VLAN Registration	●	●	●	●	●
Multicast VLAN Plus	●	●	●	●	●
ERPS	●	●	●	●	●

MTS Switches Software Functionality (Continued)

Routing Feature	MTS2600-B Basic	MTS2700-S Standard	MTS2800-E Enhanced	MTS2900-A Advanced	MTS8000 Series Software
Static route	●	●	●	●	●
RIP v1/v2		●	●	●	●
OSPF		●	●	●	●
BGP			●	●	●
ISIS			●	●	●
RIPng			●	●	●
BGP4+			●	●	●
OSPF v3			●	●	●
ISIS v6			●	●	●
IGMP v1/v2			●	●	●
IGMP v3			●	●	●
IGMP filter			●	●	●
MLD v1/v2	●	●	●	●	●
IGMP snooping	●	●	●	●	●
MLD v1/v2 snooping	●	●	●	●	●
PIM DM			●	●	●
PIM SM			●	●	●
PIM SM v6				●	●
PIM SDM			●	●	●
PIM SSM			●	●	●
DHCP Client	●	●	●	●	●
DHCP Server		●	●	●	●
DHCP relay		●	●	●	●
DHCP v6 Server/Client		●	●	●	●
DHCP v6 relay		●	●	●	●
DNS	●	●	●	●	●
FTP Server/Client	●	●	●	●	●
NTP	●	●	●	●	●
IPv6	●	●	●	●	●
IPv6 tunnel			●	●	●
GRE			●	●	●
6to4 tunnel			●	●	●
ISATAP tunnel			●	●	●
BFD			●	●	●
VRRP		●	●	●	●
VRRP v6			●	●	●
IRMP				●	●

MTS Switches Software Functionality (Continued)

IPv6 / Feature	MTS2600-B Basic	MTS2700-S Standard	MTS2800-E Enhanced	MTS2900-A Advanced	MTS8000 Series Software
Static Routing v6	🔴	🟡	🔵	🟢	🟢
IPv6	🔴	🟡	🔵	🟢	🟢
IPv6 tunnel			🔵	🟢	🟢
PIM v6-SM			🔵	🟢	🟢
IP v6 Multicast			🔵	🟢	🟢
GRE v6			🔵	🟢	🟢
TCP v6	🔴	🟡	🔵	🟢	🟢
UDP v6	🔴	🟡	🔵	🟢	🟢
RIPng		🟡	🔵	🟢	🟢
BGP4+			🔵	🟢	🟢
OSPF v3		🟡	🔵	🟢	🟢
ISIS v6			🔵	🟢	🟢
DHCP v6 Server/Client		🟡	🔵	🟢	🟢
DHCP v6 relay		🟡	🔵	🟢	🟢
Prefix List v6		🟡	🔵	🟢	🟢
BFD v6				🟢	🟢
VRRPv3			🔵	🟢	🟢

MTS Switches Software Functionality (Continued)

Management / Feature	MTS2600-B Basic	MTS2700-S Standard	MTS2800-E Enhanced	MTS2900-A Advanced	MTS8000 Series Software
Console	●	●	●	●	●
Telnet	●	●	●	●	●
SSH v1/v2	●	●	●	●	●
SNMP v1/v2	●	●	●	●	●
SNMP v3	●	●	●	●	●
RMON	●	●	●	●	●
TR069	●	●		●	●
IPFIX				●	●
OAM(802.3ah, 802.1ag, ITU Y.1731)	●	●	●	●	●
EEP	●	●	●	●	●
Syslog	●	●	●	●	●
Web UI	●	●	●		
DHCP Client	●	●	●	●	●
DHCP Server		●	●	●	●
DHCP relay		●	●	●	●
DNS	●	●	●	●	●
FTP Server/Client	●	●	●	●	●
NTP	●	●	●	●	●
TFTP	●	●	●	●	●
E-LMI	●	●	●	●	●
LLDP	●	●	●	●	●
SLA		●	●	●	●

MTS Switches Software Functionality (Continued)

Security / Feature	MTS2600-B Basic	MTS2700-S Standard	MTS2800-E Enhanced	MTS2900-A Advanced	MTS8000 Series Software
Login-Security	●	●	●	●	●
AAA	●	●	●	●	●
802.1x	●	●	●	●	●
RADIUS	●	●	●	●	●
TACACS+	●	●	●	●	●
SSH Client	●	●	●	●	●
Port security	●	●	●	●	●
Port isolation	●	●	●	●	●
UNI/NNI isolation	●	●	●	●	●
DHCP snoopin	●	●	●	●	●
Dynamic ARP Inspection (DAI)	●	●	●	●	●
IP Source Guard	●	●	●	●	●
CPU protection	●	●	●	●	●
uRPF	●	●	●	●	●
LAND attack protection	●	●	●	●	●
SYN flooding protection	●	●	●	●	●
Ping flooding protection	●	●	●	●	●
TearDrop protection	●	●	●	●	●
Ping of Death protection	●	●	●	●	●
TCP flooding protection	●	●	●	●	●
ICMP flooding protection	●	●	●	●	●
Unicast storm control	●	●	●	●	●
Multicast storm control	●	●	●	●	●
Broadcast storm control	●	●	●	●	●
IPv4/v6 Standard/Extended ACL	●	●	●	●	●
MAC ACL	●	●	●	●	●
Port ACL	●	●	●	●	●
ACL log	●	●	●	●	●
Mac Forced Forwarding	●	●	●	●	●
Loopback Detection	●	●	●	●	●
VLAN Isolation	●	●	●	●	●
HMAC-SHA256(RIP, OSPF)	●	●	●	●	●
Key Chain		●	●	●	●
APR Check	●	●	●	●	●
AARF	●	●	●	●	●

MTS Switches Software Functionality (Continued)

QoS / Feature	MTS2600-B Basic	MTS2700-S Standard	MTS2800-E Enhanced	MTS2900-A Advanced	MTS8000 Series Software
Class based QoS schedule	●	●	●	●	●
CAR	●	●	●	●	●
SP	●	●	●	●	●
WRR	●	●	●	●	●
SP+WRR	●	●	●	●	●
RED	●	●	●	●	●
WRED	●	●	●	●	●
Traffic shaping	●	●	●	●	●
Traffic policy	●	●	●	●	●
802.1p mapping	●	●	●	●	●
DSCP mapping	●	●	●	●	●

Virtualization / Feature	MTS2600-B Basic	MTS2700-S Standard	MTS2800-E Enhanced	MTS2900-A Advanced	MTS8000 Series Software
Stack	●	●	●	●	●
M-LAG	●	●	●	●	●
MAD	●	●	●	●	●
Vertical Virtualization	●	●	●	●	●

SDN / Feature	MTS2600-B Basic	MTS2700-S Standard	MTS2800-E Enhanced	MTS2900-A Advanced	MTS8000 Series Software
OpenFlow				●	●
XML API/NETCONF	●	●	●	●	●

* SDN is fully supported on MTS8000 series -A high performance media module and MTS2XXX-A
   products. MTS2824-6X-E, MTS2848-6X-S, MTS2748-6X-MP-E, MTS2724-6X-MP-E, MTS2848-6X-E
   and MTS2832TF-4X-E are hardware ready for Openflow only.

MTS2600 Series Switch - MAMMUTHUS Layer2 Gigabit Ethernet Switch with 10G Uplink Ports

Entry-level access and port extension switch

MTS2600 series switch is the entry level access switch in Mammuthus series, providing sufficient performances and flexible functions. 10 Gigabit port is available so uplink speed to core switch is assured.

All RJ45 ports in MTS2600 series switch support auto-negotiation and MDI/MDI-X, and all SFP+ slots can work under 1/10G mode. All SFP+ slots support 1G and 10G MTS SFP modules, including fiber and UTP/STP*.
* detailed information please see SFP chapter in this brochure.

For higher port density and performance at access level, MTS2600 supports stacking and downlink-oversubscribe design, in which 24 GE access ports couples with 4 10G SFP+ uplink ports. Since the MTS2600 series switch supports ERPS and have hardware based broadcast control, the switch can be deployed in ring topology.

Product Feature

Technical Information

Product description	
Type	MTS2624-4X-B
Description	1U rack mount, 24×FE/GE TX, 4×1/10G SFP+ slots, fixed single power supply, basic software
Port type and quantity	24×FE/GE TX, 4×1/10G SFP+, 1×RJ45 Console port, 1×USB 2.0, 1×Reset Button
Power supply	Fixed single power supply
Heat radiation	Fixed fan
Order No.	942999847
Mechanical construction	
Dimensions (W×D×H)	442mm×220mm×44.2mm
Weight	3.6kg
Mounting	Rack mount
Power requirement	
Operating voltage	100-240VAC, 50-60HZ or 200-240VDC
Power consumption	26W
Ambient conditions	
Operating temperature	-10°C...55°C
Storage/transport temperature	-40°C...70°C
Relative humidity(non-condensing)	10%...90%
Storage/transport humidity(non-condensing)	5%...95%
Software	
Software level	Basic software
Stacking	Stackable, up to 8 devices in one stack
Approvals	
CE / FCC	Compliant
China Network Access Certificate	Compliant
CCC approval	Compliant
RoHS compliance	RoHS((EU) 2015/863) and RoHS(GB/T26572-2011) compliant
Scope of delivery and accessories	
Scope of delivery	Device, console cable, installation package
Accessories to order separately	Network Management Industrial HiVision, SFP

MTS2700 Series Switch - MAMMUTHUS Layer3 PoE/PoE+ Gigabit Ethernet Switch with 10G Uplink Ports
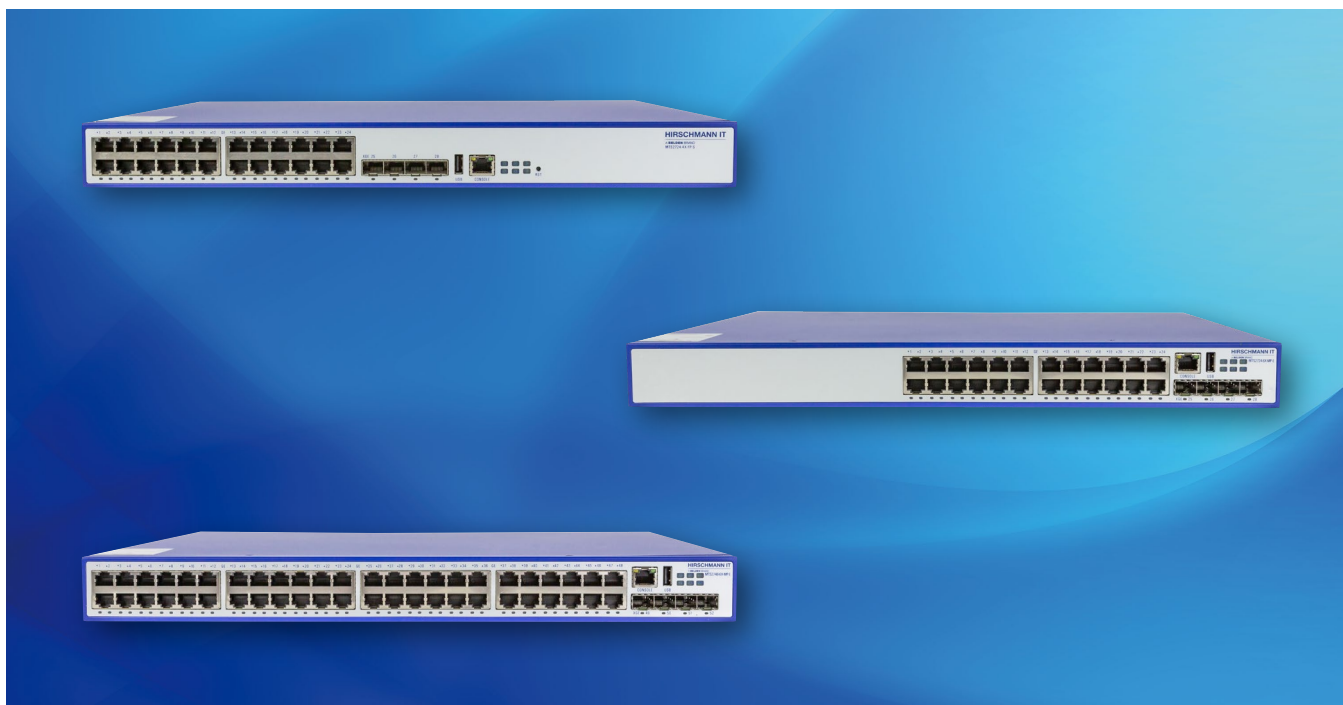
Access/aggregation switches that have comprehensive function with PoE/PoE+

MTS2700 series switches provides a whole set of access solution, which is able to support complex network design. The switches can prevent unauthorized network access or mitigate the impact of network attacks via plenty of security features.

All RJ45 ports in MTS2700 series switches support PoE/PoE+ function, which are able to provide up to 30W power supply for the PoE PD device, such as webcam, IP telephone etc. What's more, modular PSUs can provide FRU and the device can work properly under maximum temperature up to 55°C.

MTS2700 switches have comprehensive L2/L3 feature set, which can provide flexible, reliable and secure choice for network planning. Network consultant can enhance network security via DAI/DHCP snooping or can optimize multicast via IGMP snooping or can use broadcast control to ensure the network stability when UMB flooding.

Product Feature

Technical Information

Product description			
Type	MTS2724-4X-FP-S	MTS2724-6X-MP-E	MTS2748-6X-MP-E
Description	1U rack mount, 24×FE/GE POE/POE+, 4×1/10G SFP+ slots, fixed redundancy power supply, PoE output 380W, standard software	1U rack mount, 24×FE/GE POE/POE+, 4×1/10G SFP+ slots, redundant PSU, enhanced software	1U rack mount, 48×FE/GE POE/POE+, 4×1/10G SFP+ slots, redundant PSU, enhanced software
Port type and quantity	24×FE/GE POE/POE+, 4×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, 1×Reset Button	24×FE/GE POE/POE+, 4×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, no Reset Button	48×FE/GE POE/POE+, 4×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, no Reset Button
Power supply	2×fixed redundant PSUs	2×modular redundant PSUs, hot swappable	2×modular redundant PSUs, hot swappable
Extended media module	None	1×extended media module	1×extended media module slot
Heat radiation	Fixed fan		
Order No.	942999835	942999832	942999831
Mechanical construction			
Dimensions (W×D×H)	442mm×380mm×44.2mm	442mm×420mm×44.2mm	442mm×420mm×44.2mm
Weight	6.4kg	7.4kg	7.8kg
Mounting	Rack mount		
Power requirement			
Operating voltage	100-240VAC, 50-60HZ or 200-240VDC, redundancy PSU supported		
Power consumption	29W	34W	46W
Ambient conditions			
Operating temperature	-10°C...55°C		
Storage/transport temperature	-40°C...70°C		
Relative humidity(non-condensing)	10%...90%		
Storage/transport humidity(non-condensing)	5%...95%		
Software			
Software level	Standard software	Enhanced software	
Stacking	Stackable, up to 8 devices in one stack		
Approvals			
CE / FCC	Compliant		
China Network Access Certificate	Compliant		
CCC approval	Compliant		
RoHS compliance	RoHS((EU) 2015/863) and RoHS(GB/T26572-2011) compliant		
Scope of delivery and accessories			
Scope of delivery	Device, console cable, installation package		
Accessories to order separately	Network Management Industrial HiVision, SFP, extended media module		
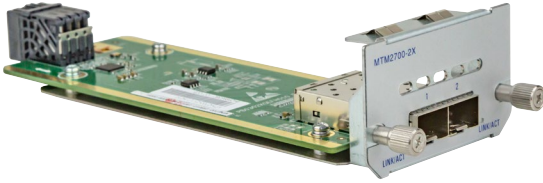
Extended media module

Product No.	Name	Number of ports	Port Type/Speed	Accessories to order separately
942999836	MTM2700-2X	2	2×1/10G SFP+ slot	SFP

Enterprise Ethernet: MTS2700 series switches accessories: PSU

Name	MTM2700-PSU120	MTM2700-PSU500	MTM2700-PSU880
Product description			
Description	AC/DC 120W PSU; Input 100-240V/2.0A; Output 12V/10A; Without PoE support	AC/DC 500W PSU; Input 100-240V/7.0A; Output 12VDC/10A, 53.5VDC/7A; POE supported	AC/DC 880W PSU; Input 100-240V/7.0A; Output 12VDC/10A, 53.5VDC/7.1A (100VAC-165VAC), 53.5VDC/14.2A (165VAC-240VAC); PoE supported
Order No.	942999834	942999833	942999837
Service			
Diagnostics	LEDs (PWR) at basic device		
Current consumption			
Activation current	typ. < 40A at 220VAC and cold start		
Technical data			
Operating voltage	100-240VAC or 200-240VDC		
Operating temperature	-10°C...55°C		
Input frequency	50-60HZ		
Nominal power of voltage supply	120W (220V/110V)	500W (220V/110V)	880W (220V)/550w (110V)
Power requirements			
Current consumption	1A (220V), 2A (110V)	3.5A (220V), 7A (110V)	7A (220V), 7A (110V)
Scope of delivery and accessories			
Scope of delivery	PSU module		

MTS2800 series switch - MAMMUTHUS Layer3 Gigabit Ethernet Switch with 10G Uplink Ports

Access/aggregation switches that can offer comprehensive L2/L3 feature sets

MTS2800 series switches provide a whole set of access and aggregation solution. All switches in this series are equipped with redundant PSUs. The switches has compact mechanical design with low noise which can fit in with 600mm×600mm compact cabinet. In addition, the switches can work properly under maximum temperature up to 55°C.

All the RJ45 ports in MTS2800 series switches support auto-negotiation and MDI/MDI-X. The switches can be applied to various working situations such as desktop, ELV room and data aggregation layer. The switches have 4 or 6 SFP+ slots and support stacking configuration, which can eliminate single point of failure and provide MC-LAG.

MTS2800 series switches have comprehensive L2/L3 feature sets and furthermore can provide flexible, reliable and secure choice for network planning. The general security and flow control technology such as DAI, DHCP snooping, IGMP snooping and 802.1x that the switches have can help administrator to deploy a secure & robust network infrastructure.

Product Feature

Technical Information

Product description

Type	MTS2848-6X-E	MTS2824-6X-E	MTS2848-6X-S	MTS2824-4X-S
Description	1U rack mount, 48×FE/GE TX, 6×1/10G SFP+ slots, fixed redundancy power supply, enhanced software	1U rack mount, 24×FE/GE TX, 6×1/10G SFP+ slots, fixed redundancy power supply, enhanced software	1U rack mount, 48×FE/GE TX, 6×1/10G SFP+ slots, fixed redundancy power supply, standard software	1U rack mount, 24×FE/GE TX, 4×1/10G SFP+ slots, fixed redundancy power supply, standard software
Port type and quantity	48×FE/GE TX, 6×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, no Reset Button	24×FE/GE TX, 6×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, no Reset Button	48×FE/GE TX, 6×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, no Reset Button	24×FE/GE TX, 4×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, 1×Reset Button
Power supply	2×Fixed redundant PSUs			
Heat radiation	Fixed fan			
Order No.	942999841	942999842	942999843	942999844

Mechanical construction

Dimensions (W×D×H)	442mm×320mm ×44.2mm	442mm×320mm ×44.2mm	442mm×320mm ×44.2mm	442mm×220mm ×44.2mm
Weight	5.8kg	5.4kg	5.8kg	3.8kg
Mounting	Rack mount			

Power requirement

Operating voltage	100-240VAC, 50-60HZ or 200-240VDC, redundancy PSU supported			
Power consumption	55W	37W	55W	26W

Ambient conditions

Operating temperature	-10°C...55°C
Storage/transport temperature	-40°C...70°C
Relative humidity (non-condensing)	10%...90%
Storage/transport humidity(non-condensing)	5%...95%

Software

Software level	Enhanced software		Standard software	
Stacking	Stackable, up to 8 devices in one stack			

Approvals

CE / FCC	Compliant
China Network Access Certificate	Compliant
CCC approval	Compliant
RoHS compliance	RoHS（(EU) 2015/863）and RoHS（GB/T26572-2011）compliant

Scope of delivery and accessories

Scope of delivery	Device, console cable, installation package
Accessories to order separately	Network Management Industrial HiVision, SFP

Technical Information

Product description			
Type	MTS2824F-4X-S	MTS2832TF-4X-E	MTS2848TF-4X-E
Description	1U rack mount, 24×100/1000M SFP slots, 4×1/10G SFP+ slots, fixed redundancy power supply, standard software	1U rack mount, 24×100/1000M SFP slots, 8×FE/GE TX, 4×1/10G SFP+ slots, fixed redundancy power supply, enhanced software	1U rack mount, 32×FE/GE TX, 16×100/1000M SFP slots, 4×1/10G SFP+ slots, modular redundant PSU, enhanced software
Port type and quantity	24×100/1000M SFP slots, 4×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, 1×Reset Button	24×100M/1000M SFP slots, 8×FE/GE TX, 4×1/10G SFP+ slots, 1×Console port, 1×USB 2.0, no Reset Button	32×FE/GE TX, 16×100/1000M SFP slots, 4×1/10G SFP+ slots, 1×RJ45 Console port, 1×USB 2.0, no Reset Button
Power supply	2×Fixed redundant PSUs		
Heat radiation	Fixed fan		
Order No.	942999845	942999846	942999849
Mechanical construction			
Dimensions (W×D×H)	442mm×320mm×44.2mm	442mm×320mm×44.2mm	442mm×420mm×44.2mm
Weight	5.8kg	5.6kg	8.5kg
Mounting	Rack mount		
Power requirement			
Operating voltage	100-240VAC, 50-60HZ or 200-240VDC, redundancy PSU supported		
Power consumption	38W	60W	55W
Ambient conditions			
Operating temperature	-10°C...55°C		
Storage/trans-port temperature	-40°C...70°C		
Relative humidity (non-condensing)	10%...90%		
Storage/trans-port humidity(non-condensing)	5%...95%		
Software			
Software level	Standard software	Enhanced software	
Stacking	Stackable, up to 8 devices in one stack		
Approvals			
CE / FCC	Compliant		
China Network Access Certificate	Compliant		
CCC approval	Compliant		
RoHS compliance	RoHS((EU) 2015/863) and RoHS(GB/T26572-2011) compliant		
Scope of delivery and accessories			
Scope of delivery	Device, console cable, installation package		
Accessories to order separately	Network Management Industrial HiVision, SFP		

MTS2900 Series Switch - MAMMUTHUS Layer3 10Gigabit Ethernet Core Switch with 40G Uplink Ports

High capacity aggregation/core switch

MTS2900 series switch provides industry leading ports density and switching speed. It not only serves as a core switch, combined with MTS2600/MTS2700/MTS2800 to offer compact data network solutions, but also works as a aggregation switch, with MTS8000 to offer large network solutions.

MTS2900 series switch offers 48 SFP+ slots, all these slots support 1G/10G SFP modules and support multiple SFP application that varies from 550m multi-mode SFP to 80km single-mode SFP+. The 40G QSFP in MTS2900 can offer high-speed uplink/interconnection links. The switch can be used in deployment model basing on spine-leaf and can support openflow 1.3 SDN controller.

MTS2900 series switch has enhanced L2/L3 feature set. It is able to support database level network and offer amazing configuration flexibility in the meantime. The switch support router protocols such as OSPF/BGP/ISIS and so on, it also support core routing protocol such as MPBGP/MPLS. In addition, MTS2900 support all switching/routing feature sets of MTS2700 & MTS2800 and can offer continuous security strategy and configuration logic.

Product Feature

Technical Information

Product description

Type	**MTS2948X-6Q-A**
Description	1U rack mount 40G Core Switch, 48×1/10G SFP+ slots, 6×40G QSFP+ slots, redundant PSU, advanced software
Port type and quantity	48×1/10G SFP+ slots, 6×40G QSFP+ slots, 1×USB, 2×RJ45 console port, 1×FE/GE RJ45 out of band management port, 1×Reset Button
Power supply	2×modular redundant PSUs, hot swappable
Heat radiation	Modular fans
Order No.	942999824

Mechanical construction

Dimensions (W×D×H)	440mm×560mm×44.2mm
Weight	12.4kg
Mounting	Rack mount

Power requirement

Operating voltage	100-240VAC 50-60Hz or 240VDC, redundancy PSU supported
Power consumption	200W

Ambient conditions

Operating temperature	-10°C...55°C
Storage/transport temperature	-40°C...70°C
Relative humidity(non-condensing)	10%...90%
Storage/transport humidity(non-condensing)	5%...95%

Software

Software level	Advanced software
Stacking	Stackable, up to 8 devices in one stack

Approvals

CE / FCC	Compliant
China Network Access Certificate	Compliant
CCC approval	Compliant
RoHS compliance	RoHS（(EU) 2015/863）and RoHS（GB/T26572-2011）compliant

Scope of delivery and accessories

Scope of delivery	Device, console cable, installation package
Accessories to order separately	Network Management Industrial HiVision, SFP, PSU module, fan module*

* A MTS2948X-6Q-A switch must have four fan modules to make it work properly.

Enterprise Ethernet: MTS2900 series switch accessories: PSU	
Name	MTM2900-PSU250
Product description	
Description	AC/DC 250W PSU; AC Input 100-240V; DC Input 192-288V, 3.5A; Output 12V/20.8A, 5VSB/2A; Hot-Swap supported.
Order No.	942999822
Service	
Diagnostics	LEDs (PWR) at basic device
Current consumption	
Activation current	typ. < 40A at 220VAC and cold start
Technical data	
Operating voltage	100-240VAC or 240VDC
Operating temperature	-10°C...55°C
Input frequency	50-60Hz
Nominal power of voltage supply	250W (220V/110V)
Power requirements	
Current consumption	1.7A (220V), 3.4A (110V)
Scope of delivery and accessories	
Scope of delivery	PSU module

Enterprise Ethernet: MTS2900 series switch accessories: Fan	
Name	MTM2900-FAN
Product description	
Description	Modular Fan, Hot-Swap supported, 4 units fan are mandatory for MTS2948X-6Q-A
Order No.	942999823
Service	
Diagnostics	LEDs (FAN) at basic device
Technical data	
Operating temperature	-10°C...55°C
Scope of delivery and accessories	
Scope of delivery	Fan module

MTS8000 Series Switch - MAMMUTHUS Layer3 Modular Core Switch

Modular core switch

MTS8000 series switch has compact configuration and powerful extension capability. The switch provides industry-leading SFP+/QSFP port density inside 6U/11U/15U chassis. Besides, it provides lots of ports in various types and can support PoE/PoE+. MTS8000, together with other switches in Mammuthus series, provides an end-to-end total network solution.

MTS8000 series switches have dual redundant engines, up to 8 media module slots and they are able to support GE, SFP, SFP+ and QSFP type of ports. Besides, both MTS8006 and MTS8010 have 2 switch fabric slots. Moreover, MTS8000 devices can be managed by SDN controller via OpenFlow 1.3. Thus, no matter serves as a spine node in spine-leaf topology or as a core node in traditional topology, MTS8000 can play its best part.

MTS8000 has enhanced L2/L3 feature set and is able to support data center level network. The switch support router protocols such as OSPF/BGP/ISIS etc. It also support core routing protocol such as MPBGP/MPLS. The switch also supports stacking and MCLAG, which can provide a higher level network redundancy and performance. Besides, MTS8000 support all switching/routing feature sets of MTS2700 & MTS2800 and can offer continuous security strategy and configuration logic.

Product Feature

Technical Information

Product description			
Type	MTS8003-Chassis	MTS8006-Chassis	MTS8010-Chassis
Description	6U rack mount, dual engine, 3×media modules, 4×modular PSUs, 2×fan trays, advanced software	11U rack mount, dual engine, 4×media modules, 2×switch fabric modules, 4×modular PSUs, 2×fan trays, advanced software	15U rack mount, dual engine, 8×media modules, 2×switch fabric modules, 4×modular PSUs, 2×fan trays, advanced software
Slot type and quantity	Including 2×engine slots, 3×media module slots	Including 2×engine slots, 4×media module slots, 2×switch fabric module slots	Including 2×engine slots, 8×media module slots, 2×switch fabric module slots
Management ports on engine	1×USB, 1×SD port, 1×RJ45 console port, 1×RJ45 CMM port, 1×micro USB console port, 1×out-of-band port, 1×RJ45 debug port and 1×reset button		
Engine redundancy	Yes		
Power supply	4×modular redundant PSUs, hot swappable		
Heat radiation	2×modular redundant Fan trays, hot swappable		
Mechanical construction			
Dimensions (W×D×H)	440mm×430mm×266mm	441mm x 434.8mm x 488mm	441mm×434.8mm×666mm
Mounting	Rack mount		
Power requirement			
Operating voltage	100-240VAC, 50-60HZ or 200-240VDC		
Ambient conditions			
Operating temperature	0°C...55°C		
Storage/transport temperature	-40°C...70°C		
Relative humidity(non-condensing)	10%...90%		
Storage/transport humidity(non-condensing)	5%...95%		
Software			
Software level	Advanced software		
Stacking	Stackable, up to 8 devices in one stack		
Approval			
CE / FCC	Compliant		
China Network Access Certificate	Compliant		
RoHS compliance	RoHS((EU) 2015/863) and RoHS(GB/T26572-2011) compliant		
Scope of delivery and accessories			
Scope of delivery	Device, console cable, installation package		
Accessories to order separately	Engine, media module, PSU, fan tray*, SFP, Network Management Industrial HiVision		

* each MTS8000 chassis must have 2×fan trays to make it work properly.

Enterprise Ethernet: MTS8000 series switch accessories: PSU	
Name	MTM8000-PSU800
Product description	
Description	MTS8003 800W Power Supply, Min. 1*PSU, Max. 4*PSUs
Order No.	942999803
Service	
Diagnostics	LEDs (PWR) at basic device
Current consumption	
Activation current	typ. < 40A at 220VAC and cold start
Technical data	
Operating voltage	100-240VAC or 200-240VDC
Operating temperature	0°C...55°C
Input frequency	50-60HZ
Nominal power of voltage supply	800W (220V/110V)
Power requirements	
Current consumption	5A (220 V), 10A (110V)
Scope of delivery and accessories	
Scope of delivery	PSU

Enterprise Ethernet: MTS8003 modular core switch accessories: Fan tray	
Name	MTM8003-FAN
Product description	
Description	Modular Fan, Hot-Swap supported, 2 units of the fan module are mandatory for MTS8003
Order No.	942999804
Service	
Diagnostics	LEDs (FAN) at basic device
Technical data	
Operating temperature	0°C...55°C
Scope of delivery and accessories	
Scope of delivery	Fan tray module

Enterprise Ethernet: MTS8006 modular core switch accessories: Fan tray	
Name	MTM8006-FAN
Product description	
Description	Modular fan tray , hot-swap supported, 2 units of the fan tray module are mandatory for MTS8006
Order No.	942999798
Service	
Diagnostics	LEDs (FAN) at basic device
Current consumption	
Activation current	typ. < 40A at 220VAC and cold start
Technical data	
Operating temperature	0°C...55°C
Scope of delivery and accessories	
Scope of delivery	Fan tray module

Enterprise Ethernet: MTS8010 modular core switch accessories: Fan tray	
Name	MTM8010-FAN
Product description	
Description	Modular fan tray , hot-swap supported, 2 units of the fan tray module are mandatory for MTS8010
Order No.	942999797
Service	
Diagnostics	LEDs (FAN) at basic device
Current consumption	
Activation current	typ. < 40A at 220VAC and cold start
Technical data	
Operating temperature	0°C...55°C
Scope of delivery and accessories	
Scope of delivery	Fan tray module

Order Information

Product Number	Product Code	Description
942999801	MTS8003-Chassis	MTS8003 Chassis, 6U, MUST have 2×FAN Trays
942999792	MTS8006-Chassis	MTS8006 Chassis, 11U, MUST have 2×FAN Trays
942999791	MTS8010-Chassis	MTS8010 Chassis, 15U, MUST have 2×FAN Trays
942999804	MTM8003-FAN	MTS8003 Fan Tray, Max. 2×Fan Trays
942999798	MTM8006-FAN	MTS8006 Fan Tray, Max. 2×FAN Trays
942999797	MTM8010-FAN	MTS8010 Fan Tray, Max. 2×FAN Trays
942999802	MTM8000-Engine	MTS8000 Engine Module, Max. 2×Engines
942999803	MTM8000-PSU800	MTS8000 800W Power Supply, Max. 4×PSUs
942999793	MTM8000-SF-A	High performance switch fabric module for MTS8000
942999794	MTM8000-SF-S	Standard performance switch fabric module for MTS8000
942999795	MTM8000-SF-24F8X-S	Hybrid card, standard switch fabric module with 24×100M/1000M SFP slots, 8×1/10G SFP + slots
942999796	MTM8000-SF-16F16X-S	Hybrid card, standard switch fabric module with 16×100M/1000M SFP slots, 16×1/10G SFP + slots
942999806	MTM8000-48F2X-S	Media module; 48×Gbit SFP slots, 2×10Gbit SFP + slots
942999807	MTM8000-48T2X-S	Media module; 48×Gbit RJ45 ports, 2×10Gbit SFP + slots
942999808	MTM8000-48TP2X-S	Media module; 48×Gbit RJ45 PoE ports, 2×10Gbit SFP + slots
942999809	MTM8000-24T24F2X-S	Media module; 24×Gbit RJ45 ports, 24×Gbit SFP slots, 2×10Gbit SFP + slots
942999811	MTM8000-16X4Q-S	Media module; 16×10Gbit SFP + slots, 4×40G QSFP + slots
942999810	MTM8000-16X-S	Media module; 16×10Gbit SFP + slots
942999814	MTM8000-52X-A	Media module; 52×10Gbit SFP + slots, high performance
942999812	MTM8000-16Q-A	Media module; 16×40G QSFP + slots, high performance
942999800	MTM8000-4QSFP28-A	Media module; 4 x 100G QSFP28 slots
942999815	MTM8000-ModuleCover	Media module slot cover
942999816	MTM8000-EngineCover	Switch Engine slot cover
942999817	MTM8000-PSUCover	Switch PSU slot cover

MAMMUTHUS Router - MTR3600-4C24T-4S

MAMMUTHUS enterprise router

Mammuthus Router(MTR) series use MIPS based multi-core processor and separated forwarding / management hardware architecture. The MTR series could handle all kinds of network situations and ensure you are in control at all time.

Mammthus router supports multiple dynamic routing protocols, various measurement, and Service Level Assurance (SLA) method, support MPLS and EVPN. Through IPv4/IPv6 dual protocol stack, MTR series could work in any single or dual protocol stack environments. It has also implements a wide range of multicast protocols, can reliably transmit multicast data in a large geographical span distributed factory environment, and can protect non multicast recipients from the impact of multi cast traffic. Last but not least, MTR series router has been integrated in the well-known Hirshmann Industrial HiVision Management software. User can manage all Hirshmann and Hirschmann IT products in NMS with the same UI, icons, and control modes.

As always MTR has the same setup logical as MTS series, for those who has experience with MTS switches can easily operate the device without any additional support.

Technical Information

Product description	
Type	**MTR3600-4C24T-4S**
Processor	Multi-Core MIPS
Flash	8GB
miscoSD card	1 × miscoSD card slot
Fixed interface	4 × GE Combo port (WAN), 24 × GE TX port (LAN)
Extension slots	4
IPSec performance	800Mbps
IPv4 routing table capacity	100,000 (OSPF)
USB	1 × USB 2.0 port, 1 × micro USB console port
RJ45 console port	1
Cooling mode	Fixed fan
Type	MTR3600-4C24T-4S
Order No.	942999775
Mechanical construction	
Dimensions (W×D×H)	442mm × 380mm × 44.3mm
Weight	5.1kg
Mounting	Rack mount
Power requirement	
Operating voltage	100-240VAC, 50-60Hz, fixed dual redundant PSU
Power consumption	54W
Ambient conditions	
Operating temperature	-10°C...55°C
Storage/transport temperature	-40°C...70°C
Relative humidity(non-condensing)	5%...85%
Storage/transport humidity(non-condensing)	5%...95%
Software	
Link-layer protocol	DDR, PPP, Frame-Relay, Bridge, HDLC, SNA, PPPoE, LACP, Port isolation, VLAN, Q-in-Q, MSTP, loopback detection, Error-Disable,SPAN, LLDP
TCP/IP Protocol	DHCP, DHCPv6, DDNS/DNS, NAT/NAT64
Routing protocol	Static Route/Static Routev6, RIP/RIPng, OSPFv2/OSPFv3, BGP/BGP4+, IS-IS/IS-ISv6, IRMP, PBR
Security	Support ACL security filtering, SSH, CPU protection, port security, AAA, IKE, PKI, 802.1X, URPF
VPN	MPLS, LDP, L2VPN, L3VPN, MPLS QoS, MPLS OAM, 6PE, GRE/GREv6, IPIP, L2TP, L2TPv3, VRF
QoS	FIFO, PQ, FQ, CBWFQ, LLQ, CAR, H-QoS, traffic shaping, Rate Limitation
Multicast	IGMP, MLD, PIM-SM/SSM, PIM-DM/SDM PIMv6-SM/SSM, MSDP, MVPN
Reliability	Backup interface, VRRP/VRRPv3, VBRP, Track, BFD/BFDv6
Management & Monitoring	Keepalive gateway, NTP, Mirroring, RMON, CLI, SSH, WEB, SNMP V1/V2/V3, Telnet, PING, Trace Route,FTP, TFTP, IPFIX traffic monitoring, IP-SLA

Technical Information

Mechanical stability	
IEC 60068-2-27 shock	15g, 11ms duration, 18 shocks
IEC 60068-2-6 vibration	1mm, 2Hz-13.2Hz, 90min.; 0.7g, 13.2Hz-100Hz, 90min.; 3.5mm, 3Hz-9Hz, 10 cycles, 1octave/min.; 1g, 9Hz-150Hz, 10 cycles, 1octave/min
EMC interference immunity	
EN 61000-4-2 electrostatic discharge (ESD)	4kV contact discharge, 8kV air discharge
EN 61000-4-3 electromagnetic field	10V/m (80-1000MHz), 3V/m (1000-6000MHz)
EN 61000-4-4 fast transients (burst)	2kV power line, 1kV data line
EN 61000-4-5 surge voltage	power line: 2kV (line/earth), 1kV (line/line), 1kV data line
EN 61000-4-6 conducted immunity	10V (150kHz-80MHz)
EN 61000-4-8 power frequency magnetic field	30A/m
EN 61000-4-11 voltage dips, short interruption	0%(20ms), 40%(300ms), 70%(500ms), 0%(5s)
EMC emitted immunity	
FCC CFR47 Part 15	FCC 47 CFR Part 15 Class A
EN 55032	EN 55032 Class A
EN 61000-3-2	EN 61000-3-2 Class A
EN 61000-3-3	EN 61000-3-3
Approvals	
Approvals	CE; FCC; CCC; China Network Access Certificate; RoHS(EU)2015/863) and RoHS(GB/T26572-2011) compliant
Scope of delivery and accessories	
Scope of delivery	1 × device, 1 × installation package
Accessories to order separately	Media module

Order information

Order Information		
Product No.	**Product Code**	**Description**
942999775	MTR3600-4C24T-4S	Enterprise router, 4 × GE Combo port (WAN), 24 × GE TX port (LAN), 4 × media module extension slot
942999776	MTR3000-1CE1	Media module for MTR3000 series enterprise router, 1 × CE1 port
942999777	MTR3000-1E1	Media module for MTR3000 series enterprise router, 1 × E1 port
942999778	MTR3000-1C	Media module for MTR3000 series enterprise router, 1 × gigabit combo port
942999779	MTR3000-4CE1	Media module for MTR3000 series enterprise router, 4 × CE1 ports
942999780	MTR3000-4E1	Media module for MTR3000 series enterprise router, 4 × E1 ports
942999781	MTR3000-1POS-OC3	Media module for MTR3000 series enterprise router, 1 × 155M POS port
942999782	MTR3000-4GT	Media module for MTR3000 series enterprise router, 4 × gigabit TX RJ45 ports
942999783	MTR3000-4G-LTE-A	Media module for MTR3000 series enterprise router, 4G media module, LTE-FDD (band:1/3), TD-LTE (band 38/39/40/41), WCDMA, TD-CDMA, EVDO, CDMA2000 1x, EDGE/GPRS/GSM
942999784	MTR3000-4GF	Media module for MTR3000 series enterprise router, 4 × gigabit SFP slots

Hirschmann IT Dragonfly Enterprise Wi-Fi 6 Access Point

Enterprise indoor and outdoor Wi-Fi 6 access point

Both indoor and outdoor series support 2.4GHz & 5GHz dual GE uplink, OFDMA, MU-MIMO and all sort of Wi-Fi 6 features that can deliver more capacity for bandwidth with less latency, which is ideal choice for your high-quality wireless requirement.

DAP620 supports a maximum concurrent data rate of 1.77Gbps (1.2Gbps in 5GHz and 573.5Mbps in 2.4GHz), four spatial streams (2SS in 2.4GHz and 2SS in 5GHz), 80MHz channels (HE80), and all mandatory Wi-Fi 6 (802.11ax) features, MU-MIMO, UL/DL OFDMA, BSS color, etc.

DAP640, DAP645, DAP646 and DAP647 supports a maximum concurrent data rate of 2.975Gbps (2.402Gbps in 5GHz and 573Mbps in 2.4GHz), six spatial streams (2SS in 2.4GHz and 4SS in 5GHz), 160(80+80)MHz channels, and all Wi-Fi 6 (802.11ax) features. It integrated BLE5/Zigbee(802.15.4) which makes it ideal for broad scope of IoT applications.

Technical Information - Indoor Series

Product description

Type	DAP620	DAP640
Description	Indoor, dual radio, 5 GHz 802.11ax 2x2:2 and 2.4 GHz 802.11ax 2x2:2, built-in antennas	Indoor, dual radio, 5 GHz 802.11ax 4x4:4 and 2.4 GHz 802.11ax 2x2:2, built-in antennas; integrated BLE/Zigbee, scanning and security function
Port type and quantity	• 2 × 10/100/1000 TX RJ45, PoE PD (IEEE 802.3at), • 1 × RJ45 Console Port • 1 × USB 2.0 Type-C • 1 × Reset button • 1 × Kensington security slot	• 1× 10/100/1000/2500Mbps RJ45 port, Eth0, PoE PD (IEEE 802.3at) • 1× 10/100/1000Mbps RJ45 port, port, Eth1, PoE PD (IEEE 802.3at) • 1 × RJ45 Console Port, • 1 × USB 2.0 Type-C, • 1 × Reset button, • 1 × Kensington security slot
Radio protocol	IEEE 802.11b; 802.11a/g/n/ac; 802.11ax; up to 1.77Gbps (1.2Gbps in 5GHz and 573.5Mbps in 2.4GHz) data rate	IEEE 802.11b; 802.11a/g/n/ac; 802.11ax; up to 2.975Gbps (2.402Gbps in 5GHz and 573Mbps in 2.4GHz) data rate
Order No.	942 999-300	942 999-304

Radio technology

Antenna connector	Built-in 2×2:2 @ 2.4GHz, 2x2:2 @ 5GHz, integrated dual-band downtilt omni-directional antennas for 2x2 MIMO with peak antenna gain of 3.3dBi in 2.4GHz and 3.3dBi in 5GHz.	Built-in 2×2:2 @ 2.4GHz, 4x4:4 @ 5GHz, BLE antenna, Four integrated dual-band downtilt omni-directional antennas for 4x4 MIMO with peak antenna gain of 4.7dBi in 2.4GHz and 4.8dBi in 5GHz.
Frequency band	• 2.400 to 2.4835 GHz • 5.150 to 5.250 GHz • 5.250 to 5.350 GHz • 5.470 to 5.725 GHz • 5.725 to 5.850 GHz *available channels: Dependent on configured regulatory domain	
Modulation	• 802.11b: BPSK, QPSK, CCK • 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM • 802.11ax: BPSK, QPSK, CCK,1 6-QAM, 64-QAM, 256-QAM, 1024-QAM	
Additional radio feature		BLE5/Zigbee (802.15.4), scanning and security function

Mechanical construction

Dimensions (W×D×H)	180mm x 180mm x 36mm	
Weight	0.6kg	0.8 kg
Mounting	Wall/Ceiling mounting	

Power requirement

Operating voltage	• Supports direct DC power and Power over Ethernet (PoE PD) • Direct DC source: 48V DC nominal, +/- 5%	
Power consumption	13.1W	24.8W

Ambient conditions

Operating temperature	0°C...45°C	0°C...50°C
Storage/transport temperature	-40°C...70°C	
Relative humidity (non-condensing)	5%...95%	
Protection class	IP41	

Technical Information - Indoor Series

Software	
Software features	Auto channel selection; Auto transmit power control; Bandwidth control per SSID; L2 roaming; L3 roaming with DAC software; Band steering; Client smart load balance; NTP server client; Wireless MESH P2P/P2MP
Management	Internal User Database; Zero-touch provisioning (ZTP); System log report; SNMP Trap Notification with DAC software; Floor plan and heat map with DAC software
Security	Captive Portal; Radius Client; Wireless QoS; Client sticky avoidance; User behavior tracking; White / black list; ACL; Rogue AP location and containment; Wireless Attack Detection
Authentication & Encryption	• 802.11i, Wi-Fi Protected Access 2 (WPA2), WPA, WPA3 (WPA3-Personal, WPA3-Enterprise) • 802.1X • Portal page authentication • Advanced Encryption Standard (AES), Temporal Key Integrity Protocol (TKIP)
Management software	DAC Software, Industrial HiVision
Compliance	
IEEE standard	• IEEE 802.11a/b/g/n/ac/ax • IEEE 802.11e WMM • IEEE 802.11h, 802.11i, 802.11e QoS • IEEE 802.11k Radio Resource Management • IEEE 802.11v BSS Transition Management • IEEE 802.11r Fast roamin
Basic standard	CE, FCC, UL
Safety	EN62368-1
Radio	EN 300 328 (2.4 GHz), EN 301 893 (5 GHz), EN 301 489-1, EN 301 489-17
Medical electrical equipment	EN 60601-1-1, EN 60601-1-2
RoHS	RoHS（EU 2015/863）and RoHS（GB/T26572-2011）compliant
Wi-Fi Alliance	Wi-Fi 6 certified, Passpoint
Scope of delivery and accessories	
Scope of delivery	Installation guide, mounting kit (AP-MNT-IN-W)
Accessories to order separately	DC power adapter

Technical Information - Outdoor Series

Product description			
Type	DAP645	DAP646	DAP647
Description	Outdoor, dual radio, 5 GHz 802.11ax 4x4:4 and 2.4 GHz 802.11ax 2x2:2, built-in omni-antennas; integrated BLE/Zigbee, scanning and security function	Outdoor, dual radio, 5 GHz 802.11ax 4x4:4 and 2.4 GHz 802.11ax 2x2:2, integrated directional antenna; integrated BLE/Zigbee, scanning and security function	Outdoor, dual radio, 5 GHz 802.11ax 4x4:4 and 2.4 GHz 802.11ax 2x2:2, external antenna; integrated BLE/Zigbee, scanning and security function
Port type and quantity	1× 10/100/1000/2500Mbps RJ45 port, Eth0, PoE PD (IEEE 802.3bt) 1×10/100/1000Mbps RJ45 port, Eth1, PoE PSE (IEEE 802.3at) 1×SFP slot 1Gbps 1×Reset button		
Radio protocol	IEEE 802.11b; 802.11a/g/n/ac; 802.11ax; up to 2.975Gbps (2.402Gbps in 5GHz and 573Mbps in 2.4GHz) data rate		
Order No.	942 999-308	942 999-312	942 999-316
Radio technology			
Antenna connector	Built-in 2×2:2 @ 2.4GHz, 4x4:4 @ 5GHz, four integrated 5GHz omni antennas for 4x4 MIMO with peak antenna gain 6.48dBi, two integrated 2.4GHz omni antennas for 2x2 MIMO with peak antenna gain 4.85dBi	Built-in 2×2:2 @ 2.4GHz, 4x4:4 @ 5GHz, four integrated 5GHz directional antennas for 4x4 MIMO with peak antenna gain 7.4dBi, two integrated 2.4GHz directional antennas for 2x2 MIMO with peak antenna gain 7.5dBi (H80°V80°)	External antennas, 2×2:2 @ 2.4GHz, 4x4:4 @ 5GHz, 6 × N femal connectors, built in 6KA antenna feeder lightning /port; ANT0-ANT3 are 5GHz band, ANT4-ANT5 support 2.4GHz band; Integrated BLE antenna
Frequency band	2.400 to 2.4835 GHz 5.150 to 5.250 GHz 5.250 to 5.350 GHz 5.470 to 5.725 GHz 5.725 to 5.850 GHz *available channels: Dependent on configured regulatory domain		
Modulation	802.11b: BPSK, QPSK, CCK 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM 802.11ax: BPSK,QPSK,CCK,16-QAM,64-QAM,256-QAM,1024-QAM	802.11b: BPSK, QPSK, CCK 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM 802.11n high-throughput (HT) support: HT 20/40 802.11ac very high throughput (VHT) support: VHT 20/40/80 802.11ax(HE):BPSK, QPSK, CCK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM	802.11b: BPSK, QPSK, CCK 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM 802.11ax: BPSK,QPSK,CCK,16-QAM,64-QAM,256-QAM,1024-QAM
Additional radio feature	BLE5/Zigbee (802.15.4), scanning and security function		
Mechanical construction			
Dimensions (W×D×H)	243mm x 243mm x 85mm		
Weight	2.5kg		
Mounting	Pole mounting	Pole/Wall mounting	

Technical Information - Outdoor Series

Power requirement	
Operating voltage	Support Power over Ethernet (IEEE 802.3bt, 802.3at)
Power consumption	• 24W (802.3at PoE in, Eth1 PSE disabled) • 46W (802.3bt Type3 PoE in, Eth1 supports 802.3af PSE) • 64W (802.3bt Type4 PoE in, full functions, Eth1 supports 802.3at PSE)
Ambient conditions	
Operating temperature	-40°C...65°C
Storage/transport temperature	-40°C...85°C
Relative humidity (non-condensing)	0%...100%
Protection class	IP67
Wind resistance	up to 100MPH sustained winds; up to 165MPH wind gusts
Software	
Software features	Auto channel selection; Auto transmit power control; Bandwidth control per SSID; L2 roaming; L3 roaming with DAC software; Band steering; Client smart load balance; NTP server client; Wireless MESH P2P/P2MP
Management	Internal User Database; Zero-touch provisioning (ZTP); System log report; SNMP Trap Notification with DAC software; Floor plan and heat map with DAC software
Security	Captive Portal; Radius Client; Wireless QoS; Client sticky avoidance; User behavior tracking; White / black list; ACL; Rogue AP location and containment; Wireless Attack Detection
Authentication & Encryption	• 802.11i, Wi-Fi Protected Access 2 (WPA2), WPA, WPA3 (WPA3-Personal, WPA3-Enterprise) • 802.1X • Portal page authentication • Advanced Encryption Standard (AES), Temporal Key Integrity Protocol (TKIP)
Management software	DAC Software, Industrial HiVision
Compliance	
IEEE standard	• EEE 802.11a/b/g/n/ac/ax • IEEE 802.11e WMM • IEEE 802.11h, 802.11i, 802.11e QoS • IEEE 802.11k Radio Resource Management • IEEE 802.11v BSS Transition Management • IEEE 802.11r Fast roaming
Basic standard	CE, FCC, UL
Safety	EN61131-2, EN62368-1, EN60950-22
Radio	EN 300 328 (2.4 GHz), EN 301 893 (5 GHz), EN 301 489-1, EN 301 489-17
Medical electrical equipment	EN 60601-1-1, EN 60601-1-2
RoHS	RoHS ((EU)2015/863) and RoHS (GB/T26572-2011) compliant
Wi-Fi alliance	Wi-Fi 6 certified, Passpoint
Scope of delivery and accessories	
Scope of delivery	Installation guide
Accessories to order separately	Mounting kit (AP-MNT-OUT-H), PoE injector, SFP module (only support HIT SFP module), SFP Gland	Mounting kit (AP-MNT-OUT), PoE injector, SFP module (only support HIT SFP module), SFP Gland	Mounting kit (AP-MNT-OUT), PoE injector, SFP module (only support HIT SFP module), SFP Gland , Cables 2m,5m,15m

Hirschmann IT Dragonfly Access Point Virtual Controller

Enterprise access point management software platform

Dragonfly Access Point Virtual Controller (DAC) from Hirschmann IT is the WiFi cloud management system specifically designed for large wireless network deployment scenarios with continuous geographic coverage in large and medium-sized enterprises as well as educational institutions.

Together with the full range of Hirschmann IT brand WiFi6 AP hardware devices, it can fully meet the needs of large and medium-sized enterprises/institutions for high-density office and high-coverage business scenarios. It can also be fully integrated into standard large IT infrastructures and provide customers with a comprehensive solution for network management and customer experience assurance.

PaaS Attributes of Private Cloud Platform and Physical Attributes of Products

Hirschmann IT offers a full range of APs that can work in one of two modes: Cluster mode and DAC mode, depending on the customer's choice. When the customer's AP works in DAC mode, it means that in addition to the hardware investment in the AP, the customer needs to purchase a separate DAC management software platform (compatible with mainstream x86 hardware platforms) and apply for a dedicated "AP Management license" (one-time, no time limit). The benefits of the PaaS (Platform as a Service) model can be enjoyed in a completely software-based, inexpensive, but high-performing way.

Depending on the actual size of the wireless network and the required security level, customers can choose different installation platforms for the DAC private cloud system, either as a direct bare machine-based installation or as a flexible virtual machine-based multiplexing installation.

Networking Architecture of DAC Private Cloud Platform

The WiFi solution of DAC private cloud platform is built on the basis of AP clustering technology with innovative "unsubstantial AC networking architecture" on the lower end, the upper end is the configuration management mechanism of the highly reliable private cloud infrastructure platform based on Docker container technology.

Under the DAC system, customers need to predefine the deployment location and the number of APs required for their wireless network according to their own wireless network scale requirements. After the APs are deployed and activated with power according to the wireless planning results, the APs will automatically complete registration on the private cloud platform through a common DHCP process and a dedicated secure channel, and appear under the customer's designated administrator account, awaiting further configuration and management actions. Customers do not feel a significant difference between the (private) cloud management model and the local management model throughout the wireless network deployment and operation process, and the experience is inherited and fully user-friendly.

This design architecture maximizes both the usability and reliability of the wireless network, which we hope will provide our customers with the ability to deploy WiFi wireless networks everywhere.

Technical Information

Product description	
Description	Software-based WLAN central management solution for all-scale wireless networks from medium-sized institute to large enterprise; built and deployed on Linux OS, and also could be deployed on VMWare ESXi or Microsoft Hyper-V platform;
OS platform	Virtual machine software: VMWare ESXi 6 (or newer) or Microsoft Hyper-V; OS: ubuntu 16.04 server and above;
Processor and RAM	Recommendation: 4core 16G for scale of 50APs+1000Clients; 8core 16G for scale of 256APs+5000Clients; 12core 32G for scale of 500APs+10000Clients; 24core 32G for scale of 1000APs+20000Clients;
Hard disk space	Recommendation: 1T Hard disk, I/O: Input 134MB/s, Output 1.7GB/s;
Order No.	Refer to order information
Radio technology	
Background Scanning	Background scanning mode enables AP to work intermittently or continuously to maintain normal operation of WIFI system, as well as get as much background information of air-interface as possible, by means of consuming portion of air-interface resources. • Normal background scanning mode; • Enhanced background scanning mode, which allows AP to obtain more information on nearby clients and neighboring APs, and the scanning result can be applied by other upper-level applications.
Roaming	Seamless handover between radio cells; • On layer 2, DAC supports IEEE 802.11k(Radio Resource Measurement), 802.11v(Wireless Network Management), and 802.11r(Fast Roaming). 802.11k/v enable clients to find the best candidate APs for roaming, while 802.11r optimize association process between Clients and APs. In addition, OKC mechanism is also supported by DAC; • On layer 3 DAC supports layer 3 roaming by establishing tunnel between AP and Client before roaming happening. Note: 1) IEEE 802.11r is available when using 802.1x authentication or pre-shared keys(PSK) authentication; 2) OKC is available when using 802.1x authentication method only.
Load Balance	Load Balance is a systemic mechanism, to provide overall effectiveness of Load balance between different bands of one AP or different APs under one AP cluster. • 5GHz band steering function, AP will steer more capable clients to 5GHz band where more channel resources are available; • Under AP cluster, it navigates clients to connecting to the best AP by measuring AP's workload according to quantity of connected clients as well as SNR value (downlink); • Manual mode allows administrator to adjust specific RSSI value to determine threshold of association and roaming for clients to meet particular requirements.
Automatic Channel Selection	• Automatic wireless channel list setting in accordance with each country's regulation; • Automatic wireless channel bandwidth setting on 2GHz or 5GHz according to IEEE 802.11 standard; • Automatic wireless channel sub-list setting with specified channel list selected by administrator.
Automatic TxPower Control	• Wireless transmit power on each channel can be automatically controlled by system; • Wireless transmit power on each channel can be specified as fixed value by administrator; • Wireless transmit power on each channel can also be specified in a range by administrator.

Technical Information

RF optimization	RF technology and optimization approaches to improve end-users' experience: • Single or dual bands is selectable by administrator according to on-site environments; • QoS (802.1p/DSCP to WMM) on voice and video data to ensure they work on high priority; • Voice and video services awareness and optimization to ensure their priority is higher than other services; • Enable Short GI upon better SNR transmission; • Enable 802.11ax work mode on each band; • Regularly switch on/off wireless service; • Allow administrator to limit access from legacy 802.11b/g devices to ensure bandwidth efficiency on 2.4GHz.
Authentication and Access Control	
Authentication Platform	• Support Radius server, MAC auth server, embedded Portal server, and Radius client for third-party Radius server, LDAP/AD client for external LDAP/AD infrastructure; • Support standard Personal and Enterprise authentication mode; • Support multiple authentication methods, such as MAC, 802.1x, MAC with Portal, and 802.1x with Portal;
Radius Server	• Support internal and external Radius server; • Internal Radius server supports Access Role Profile mechanism; • Authentication methods include: PAP, CHAP, MS-CHAP, MS-CHAPv2, EAP-MD5-Challenge, EAP-GTC, and EAP-MSCHAPv2;
Portal Server	• Support "guest" and "employee" authentication mode; • DAC provides tailored Portal page template; • DAC Portal server supports record end-device by MAC address; • Supports inter-connection with external Portal server;
Access Role Profile	DAC provides authenticated users by appropriate rights with Access Role Profile. Details as following: • Administrator can define detailed Policy and Policy list for each Profile; • Policy supports ACL, while Policy list consist of a group of policies; • Administrator can define access control rules based on location and period attribute; • Support QoS attribute likes bandwidth limitation on uplink or downlink for each profile; • Support VLAN attribute, to assign specific clients into defined VLAN or VLAN pool; • Access Role Profile function is implemented on AP.
Security features*	
WIDS (Wireless Intrusion Detection System)	DAC provides comprehensive security function to ensure customer wireless cyber security. The system identifies rogue APs by means of following policy and criteria. • To detect when APs' signal strength threshold exceeds the value defined by administrator; • To detect if APs' SSID name is valid according to system definition; • To detect by defined key words (defined by administrator) within SSID name of APs; • To detect by defined OUI (Organizational Unique Identifier within first six digits of MAC address) of APs, refer to Blacklist mechanism; • To detect by defined legal OUI, refer to Whitelist mechanism; DAC is also able to detect following cyber-attack behaviors from potential rogue APs or clients: • APs: AP Spoofing, Broadcast de-authentication, Broadcast disassociation, Ad-hoc network with SSID being used in current infrastructure, invalid long SSID, AP impersonation, Omerta attack, Null probe response, invalid address combination, invalid reason code of de-authentication, invalid reason code of dis-association; • Clients: Valid Client mis-association, Omerta Attack, Unencrypted Valid Clients, 802.11 40MHz bandwidth intolerance setting, Active 802.11n Greenfield Mode, DHCP client ID, DHCP conflict, DHCP name change, Frequent authentication, long SSID (client), Malformed Frame-Assoc request, invalid reason code of de-authentication, invalid reason code of dis-association;

Technical Information

WIPS (Wireless Intrusion Prevention System)	In cooperate with WIDS, DAC provides WIPS to implement relevant security policies: • Security policy to suppress rogue APs to mitigate destructive impacts, by preventing clients from connecting to rogue APs; • Security policy to suppress rogue clients (active/passive) to mitigate negative effects, by means of blacklist mechanism (static or dynamic); • Security policy to protect legal equipment by providing whitelist mechanism.
Wireless cyber security dashboard	DAC provide informative dashboard to represent wireless cyber security situation, which is a comprehensive tool to inform user of security status and events. • Show Rogue APs and channel interference; • Show Rogue Clients and associated Rogue APs; • Show Blacklist status of clients; • Show cyber-attack behavior with details like time record, and etc..
Access control	Access control and security mechanism are implemented on AP, • Stateful IPv4 ACL functionality: Packet filtering in ARP for each authorized Client; • Layer2 isolation among Clients within one SSID.
Service	
AP Registration	Users can execute AP registration processes automatically or manually for single device or batch devices, • Automatic registration by DHCP option; • Manual registration requires administrator to specify DAC IP address for APs initially working on Cluster mode.
Report Generation	Report system provides online report generation, audit and offline report sending by email address, • administrator can specify scope of report generation, from Corp-Site-Group; • administrator can define time interval of reports, including Daily report, Weekly report, and Monthly report; • administrator can review a report online (on DAC Web UI), or choose to receive a report by email at anytime.
Configuration Wizard	By wizard flow, it is easy for a new user to set up exclusive wireless network from corporation-site-group network scale step by step.
Asset Management	Based on Bluetooth technology on capable AP, DAC provides I/O to interconnect with third-party Asset Management Platform; Note: Bluetooth portable devices, positioning engine, as well as asset management service and application are required.
Other Services	• IPv4: DHCP (Server and Client) only for APs' IP address assignment, Radius (Server, Proxy, Client); LDAP client; AD client; Standard Portal (Portal Server, Portal proxy); Internal Log system; Internal Notification system; External syslog interconnect; Internet standard HTTP API; • IPv6: only available for data forwarding function on AP; • ARP and Proxy ARP function on AP.
Software	
Radius Server	Radius/EAP Server supports User administration MAC-based, rate limiting, passphrases, VLAN user based, authentication of IEEE 802.1X clients via EAP-TTLS, EAP-MD5, EAP-GTC, PEAP, MSCHAP or MSCHAPv2;
Roaming (Opportunistic Key Caching)	OKC enable clients to perform fast roaming behavior between APs. IEEE 802.1X authentication key between clients and APs is transmitted to all managed APs by DAC.
Redundancy	High availability cluster mode based on K8s platform, with three physical machines for one logical DAC entity, ideal for large scale network deployment.
Timing service	Activate/inactivate WLAN network (SSID) by time.
Management interface	HTML5 web interface (HTTPs) and Command Line.

Technical Information

AP Management	• Automatically discover the DAC by means of DHCP option 43; • Manual authentication/registration via web configuration of DAC; • Semi-automatic authentication/registration according to AP list in DAC ('bulk mode'); • DAC can collect APs' notification and log by SYSLOG protocol or internal traps (proprietary protocol).
AP Firmware Management	• Central Firmware deployment (requires external webserver or SFTP server) and management of APs; • Up to date AP firmware version daily checking according to defined policy; • DAC automatically downloads FW from FW server and updates it with required APs.
Switching	Below data are switching at AP side: • VLAN IEEE 802.1q, Multicast Snooping (IGMP and MLD), user data per SSID or per ARP (access role profile of clients); • Support VLAN or VLAN pool; • Data on layer2 are isolated within one SSID.
Routing	AP supports following routing functions (DHCP server, NAT, DNS proxy) and works as default gateway for clients.
WLAN Access Point	
AP's functionality	• For small network scale with less than 256 APs, APs are able to work under "cluster" mode to achieve self-management; • For middle/large network scale, APs should be managed by DAC platform in order to perform central management, maintenance and high resilience.
Scope of delivery and accessories	
Scope of delivery	License Key will be delivered. The License Key is used with the Hardware-ID to request a License File. This License File is used to activate the product.

Order information

Part number	Part name	Description
942999321	DAC-50	Software DAC platform with license for 50 AP and 1000 clients
942999322	DAC-256	Software DAC platform with license for 256 AP and 5000 clients
942999323	DAC-500	Software DAC platform with license for 500 AP and 10000 clients
942999324	DAC-1000	Software DAC platform with license for 1000 AP and 20000 clients
942999327	DAC-Sec-50	Software DAC platform security features license for 50 AP
942999328	DAC-Sec-256	Software DAC platform security features license for 256 AP
942999329	DAC-Sec-500	Software DAC platform security features license for 500 AP
942999330	DAC-Sec-1000	Software DAC platform security features license for 1000 AP

RAVEN 5000 Series
Next Generation Firewall

RAVEN NGFW is Hirschmann IT's next generation firewall, which is designed and manufactured specially for IT/OT convergence application. It reduces the security risk resulting from the integration of new information technologies and traditional operating technologies in any IT/OT converged network. Via functions such as HA, NGFW, NGIPS, etc. RAVEN NGFW significantly reduce network risk exposure, enhance cyber security level and reduce total cost of ownership in the whole network life cycle.

RAVEN NGFW accommodates to the needs of high reliability, low latency and flexible deployment via compact design, robust HA mechanism and control/forwarding layer separation design. With the help of RAVEN EYE global threat update center, RAVEN NGFW can take a quick reaction to newly arising threats. Besides, RAVEN supports multiple media modules and the speed rate of the interface on these media modules ranging from 1G to 40G, which further enhances the capability of firewall and supports various networks.

Offering application identification (APP-ID), RAVEN NGFW understands thousands protocols, and each protocol will be carefully inspected. RAVEN prevent any unexpected behavior. Benefit from RAVEN EYE, RAVEN NGFW provides continuous threat prevention and will quickly adapt to new security trends continuously. RAVEN NGFW has flexible deployment, which provides HA and virtualization, supports transparent and routing mode. Thus, it doesn't break your security strategy and can work anywhere.

Product Feature

Technical Information

Product description

Type	RAVEN 5700	RAVEN 5500	RAVEN 5300	RAVEN 5300-F
Description	1U rack mount, 6×fixed FE/GE TX ports and 4×fixed 100/1000M SFP slots, 2×extended media module slots, redundant PSU	1U rack mount, 6×fixed FE/GE TX ports, 2×100/1000M SFP ports, 2×1/10G SFP ports, 2×extended media module slot, redundant PSU	1U rack mount, 6×fixed FE/GE TX ports, 1×extended media module slot, redundant PSU	1U rack mount, 6×fixed FE/GE TX ports, fixed single PSU
Port type and quantity	6×fixed FE/GE TX ports, 4×fixed 100/1000M SFP slots, 2×USB, 1×RJ45 console port	6×fixed FE/GE TX ports, 2×100/1000M SFP ports, 2×1/10G SFP ports, 2×USB, 1×RJ45 console port	6×fixed FE/GE TX ports, 2×USB, 1×RJ45 console port	6×fixed FE/GE TX ports, 2×USB, 1×RJ45 console port
Power supply	2×fixed redundant PSUs			1×fixed single PSU
Heat radiation	Fixed fan			
Extended slot	2×extended media module slots		1×extended media module slot	None
Default storage capacity	60G SSD		Optional	
Order No.	942999701	942999702	942999703	942999704

Performance and capacity

Performance (firewall)	60G	20G	4G	4G
Connection per second (firewall)	320,000/s	90,000/s	68,000/s	68,000/s
Performance (enable NGFW)	23G	6G	3.4G	3.4G
Connection per second (NGFW)	89,000/s	21,000/s	12,000/s	12,000/s
IPSec VPN default tunnel	5,000	4,000	1,000	1,000
Virtual FW (default/maximum)	2/5	-	-	-
Concurrent connection	3.2million	2.9million	1.2million	1.2million

Technical Information

Mechanical construction				
Dimensions (W×D×H)	435mm×500mm ×44.5mm	435mm×360mm ×44.5mm	435mm×360mm ×44.5mm	435mm×360mm ×44.5mm
Weight	13.2kg	7.5kg	8.1kg	7.6kg
Mounting	Rack mount			
Power requirement				
Operating voltage	100-240VAC, 47-63Hz, redundant PSU supported		100-240VAC, 50-60Hz, redundant PSU supported	100-240VAC, 50-60Hz
Ambient conditions				
Operating temperature	-5°C...45°C			
Storage/transport temperature	-20°C...70°C			
Relative humidity (non-condensing)	5°C...85°C			
Storage/transport humidity (non-condensing)	5°C...95°C			
Approvals				
CE / FCC	Compliant			
China Network Access Certificate	Compliant			
RoHS compliance	RoHS((EU) 2015/863) and RoHS(GB/T26572-2011) compliant			
Scope of delivery and accessories				
Scope of delivery	1×device, 1×grounding wire, 2×power cord*, 1×console cable, 1×Cat5UTP 2M, 1×installation package			
Accessories to order separately	SFP, media module			

Order Information

Product No.	Product Code	Description
Next Generation Firewall (NGFW)		
942999704	RAVEN 5300-F	6 × fixed GE TX ports
942999703	RAVEN 5300	6 × fixed GE TX ports, 1 × extended slot
942999702	RAVEN 5500	6 × fixed GE TX ports, 1 × extended slot
942999701	RAVEN 5700	6 × fixed GE TX ports and 4 × fixed GE SFP ports, 2 × extended slot
NGFW Bundle		
942999757	RAVEN 5700-1YR Bundle	RAVEN 5700 bundle, 1 × RAVEN 5700 device + 1 year premium support & warranty + 1 year subscription
942999758	RAVEN 5500-1YR Bundle	RAVEN 5500 bundle, 1 × RAVEN 5500 device + 1 year premium support & warranty + 1 year subscription
942999759	RAVEN 5300-1YR Bundle	RAVEN 5300 bundle, 1 × RAVEN 5300 device + 1 year premium support & warranty + 1 year subscription
942999760	RAVEN 5300-F-1YR Bundle	RAVEN 5300-F bundle, 1 × RAVEN 5300-F device + 1 year premium support & warranty + 1 year subscription
Extended Media Module for NGFW		
942999705	RAVEN 5000M-4T	4 × GE TX ports media module, applicable for RAVEN 5000 series
942999706	RAVEN 5000M-4F	4 × GE SFP ports media module, applicable for RAVEN 5000 series
942999707	RAVEN 5000M-8T	8 × GE TX ports media module, applicable for RAVEN 5000 series
942999708	RAVEN 5000M-8F	8 × GE SFP ports media module, applicable for RAVEN 5000 series
942999709	RAVEN 5000M-4T4F	4 × GE TX ports and 4 × GE SFP ports media module, aapplicable for RAVEN 5000 series
942999710	RAVEN 5000M-2X	2 × 10GE SFP+ ports media module, applicable for RAVEN 5000 series
942999711	RAVEN 5000M-4X	4 × 10GE SFP+ ports media module, applicable for RAVEN 5000 series
942999712	RAVEN 5000M-2Q	2 × 40GE QSFP+ ports media module, only applicable for RAVEN 5700

Order Information

Product No.	Product Code	Description
RAVEN 5000 Premium Support & Warranty1		
942999721	RAVEN 5700-Support-1YR	Premium support & warranty 1 year, RAVEN 5700
942999722	RAVEN 5700-Support-3YR	Premium support & warranty 3 year, RAVEN 5700
942999723	RAVEN 5700-Support-5YR	Premium support & warranty 5 year, RAVEN 5700
942999724	RAVEN 5500-Support-1YR	Premium support & warranty 1 year, RAVEN 5500
942999725	RAVEN 5500-Support-3YR	Premium support & warranty 3 year, RAVEN 5500
942999726	RAVEN 5500-Support-5YR	Premium support & warranty 5 year, RAVEN 5500
942999727	RAVEN 5300-Support-1YR	Premium support & warranty 1 year, RAVEN 5300
942999728	RAVEN 5300-Support-3YR	Premium support & warranty 3 year, RAVEN 5300
942999729	RAVEN 5300-Support-5YR	Premium support & warranty 5 year, RAVEN 5300
942999730	RAVEN 5300-F-Support-1YR	Premium support & warranty 1 year, RAVEN 5300-F
942999731	RAVEN 5300-F-Support-3YR	Premium support & warranty 3 year, RAVEN 5300-F
942999732	RAVEN 5300-F-Support-5YR	Premium support & warranty 5 year, RAVEN 5300-F
RAVEN 5000 Signature Database Subscription2		
942999733	RAVEN 5700-Subscription-1YR	RAVEN 5700 signature database subscription, 1 year
942999734	RAVEN 5700-Subscription-3YR	RAVEN 5700 signature database subscription, 3 year
942999735	RAVEN 5700-Subscription-5YR	RAVEN 5700 signature database subscription, 5 year
942999736	RAVEN 5500-Subscription-1YR	RAVEN 5500 signature database subscription, 1 year
942999737	RAVEN 5500-Subscription-3YR	RAVEN 5500 signature database subscription, 3 year
942999738	RAVEN 5500-Subscription-5YR	RAVEN 5500 signature database subscription, 5 year
942999739	RAVEN 5300-Subscription-1YR	RAVEN 5300 signature database subscription, 1 year
942999740	RAVEN 5300-Subscription-3YR	RAVEN 5300 signature database subscription, 3 year
942999741	RAVEN 5300-Subscription-5YR	RAVEN 5300 signature database subscription, 5 year
942999742	RAVEN 5300-F-Subscription-1YR	RAVEN 5300-F signature database subscription, 1 year
942999743	RAVEN 5300-F-Subscription-3YR	RAVEN 5300-F signature database subscription, 3 year
942999744	RAVEN 5300-F-Subscription-5YR	RAVEN 5300-F signature database subscription, 5 year

1: premium support does not contain on-site support
2: RAVEN 5000 signature database subscription contains threat prevention & URL filtering & anti-virus & APP-ID updates

RAVEN 4000 Series
RAVEN Intrusion Detection System

RAVEN IDS (Intrusion Detection System) is a new network security device developed by Hirschmann IT for compliance requirement and cyber security trend. With the popularization of network security concepts and the promotion of successful practice experience, many customers have begun to regard network security compliance as an important goal of network construction. In addition, the customization of network applications has become more common, and the risks introduced by traditional firewall and inline network detection system become difficult to ignore. Thus, IDS endows administrators with another option to deal with security risks.

RAVEN IDS helps administrators understand the risks in network as soon as possible and helps them take correct actions. Its powerful historical baseline analysis system helps users understand the historical changes of network risks in depth and correctly evaluate the benefits of each security reinforcement. RAVEN IDS can co-work with other RAVEN security products (such as RAVEN Next Generation Firewall, RAVEN EYE), and Hirschmann EAGLE products to create efficient, comprehensive and intelligent security solutions for customers and reduce the security risks in the process of IT/OT convergence.

Product Feature

Technical Information

Product description		
Type	RAVEN 4500	RAVEN 4300
Description	2U rack mount, 5 × fixed FE/GE TX ports, 1 × extended media module slot, fixed redundant PSU	1U rack mount, 5 × fixed FE/GE TX ports, 1 × extended media module slot, fixed single PSU
Port type and quantity	5 × fixed FE/GE TX ports, 2 × USB, 1 × RJ45 console port, 1 × GE TX out of band management port	
Power supply	2 × Fixed redundant PSUs	Fixed single PSU
Heat radiation	Fixed fan	
Extended slot	1 × extended media module slot	
Order No.	942999713	942999714
Mechanical construction		
Dimensions (W×D×H)	435mm × 360mm × 88mm	435mm × 360mm × 44mm
Weight	9.6kg	8.1kg
Mounting	Rack mount	
Power requirement		
Operating voltage	100-240VAC, 50-60Hz, redundant PSU supported	100-240VAC, 50-60Hz
Ambient conditions		
Operating temperature	0°C...40°C	
Storage/transport temperature	-20°C...70°C	
Relative humidity (non-condensing)	5%...85%	
Storage/transport humidity (non-condensing)	5%...95%	
Approvals		
CE / FCC	Compliant	
China Network Access Certificate	Compliant	
RoHS compliance	RoHS((EU) 2015/863) and RoHS(GB/T26572-2011) compliant	
Scope of delivery and accessories		
Scope of delivery	1 × device, 1 × grounding wire, 2 × power cords*, 1 × console cable, 1 × Cat5UTP 2M, 1 × installation package	
Accessories to order separately	Media module	

* RAVEN 4300 only have 1 × power cord.

Order Information		
Product No.	**Product Code**	**Description**
IDS		
942999713	RAVEN 4500	5 x GE TX ports, 1 × RJ45 console port, 1 × extended slot
942999714	RAVEN 4300	5 x GE TX ports, 1 × RJ45 console port, 1 × extended slot
IDS Bundle		
942999761	RAVEN 4500-1YR Bundle	RAVEN 4500 bundle, 1 × RAVEN 4500 device + 1 year premium support/warranty + 1 year subscription
942999762	RAVEN 4300-1YR Bundle	RAVEN 4300 bundle, 1 × RAVEN 4300 device + 1 year premium support/warranty + 1 year subscription
Extended Media Module for IDS		
942999715	RAVEN 4500M-8T	8 × GE TX ports media module for RAVEN 4500
942999716	RAVEN 4500M-8F	8 × GE SFP ports media module for RAVEN 4500
942999717	RAVEN 4500M-4T4F	4 × GE TX ports and 4 × GE SFP ports media module for RAVEN 4500
942999718	RAVEN 4300M-8T	8 × GE TX ports media module for RAVEN 4300
942999719	RAVEN 4300M-8F	8 × GE SFP ports media module for RAVEN 4300
942999720	RAVEN 4300M-4T4F	4 × GE TX ports and 4 × GE SFP ports media module for RAVEN 4300
RAVEN 4000 Premium Support & Warranty[1]		
942999745	RAVEN 4500-Support-1YR	Premium support & warranty 1 year, RAVEN 4500
942999746	RAVEN 4500-Support-3YR	Premium support & warranty 3 year, RAVEN 4500
942999747	RAVEN 4500-Support-5YR	Premium support & warranty 5 year, RAVEN 4500
942999748	RAVEN 4300-Support-1YR	Premium support & warranty 1 year, RAVEN 4300
942999749	RAVEN 4300-Support-3YR	Premium support & warranty 3 year, RAVEN 4300
942999750	RAVEN 4300-Support-5YR	Premium support & warranty 5 year, RAVEN 4300
RAVEN 4000 Signature Database Subscription[2]		
942999751	RAVEN 4500-Subscription-1YR	IDS signature database subscription 1 year, RAVEN 4500
942999752	RAVEN 4500-Subscription-3YR	IDS signature database subscription 3 year, RAVEN 4500
942999753	RAVEN 4500-Subscription-5YR	IDS signature database subscription 5 year, RAVEN 4500
942999754	RAVEN 4300-Subscription-1YR	IDS signature database subscription 1 year, RAVEN 4300
942999755	RAVEN 4300-Subscription-3YR	IDS signature database subscription 3 year, RAVEN 4300
942999756	RAVEN 4300-Subscription-5YR	IDS signature database subscription 5 year, RAVEN 4300

1: premium support does not contain on-site support
2: RAVEN 4000 signature database subscription contains IDS signature database updates

SFP Transceiver Modules

100M SFP Module

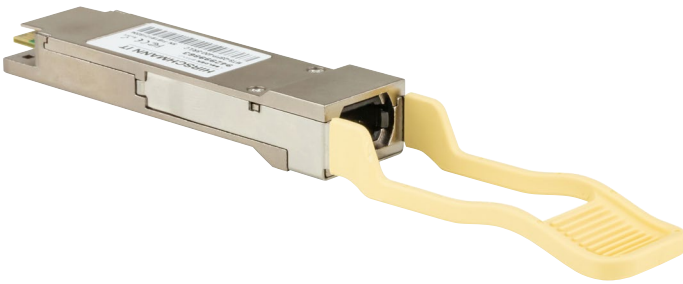| Product Number	Product Code	Description
942999873	MTS-SFP-100M-MM/LC	100Mbps, multi-mode, 2km
942999874	MTS-SFP-100M-SM/LC	100Mbps, single-mode, 20km
942999879	MTS-SFP-100M-LX/LC	100Mbps, Single-mode, 1310nm, LC, 40Km, DDMI

1G SFP module

Product Number	Product Code	Description
942999854	MTS-SFP-1G-TX/RJ45	1Gbps,SFP TX/RJ45
942999855	MTS-SFP-1G-SX/LC	1Gbps,Multi-mode,850nm,LC,550m,DDMI
942999856	MTS-SFP-1G-LX/LC	1Gbps,Single-mode,1310nm,LC,20Km,DDMI
942999857	MTS-SFP-1G-LX+/LC	1Gbps,Single-mode,1310nm,LC,40Km,DDMI
942999858	MTS-SFP-1G-LH/LC	1Gbps,Single-mode,1310nm,LC,80Km,DDMI
942999859	MTS-SFP-1G-LH+/LC	1Gbps,Single-mode,1550nm,LC,100Km, DDMI
942999860	MTS-SFP-1G-BIDI-TypeA-LX/LC	1Gbps,Single-mode,TX1310nm,RX1550nm, LC,10Km-TYPE A
942999861	MTS-SFP-1G-BIDI-TypeB-LX/LC	1Gbps,Single-mode,TX1550nm,RX1310nm, LC,10Km-TYPE B
942999862	MTS-SFP-1G-LX+/LC-1550	1Gbps,Single-mode,1550nm,LC,40Km,DDMI

10G SFP module

Product Number	Product Code	Description
942999851	MTS-SFP-10G-SR/LC	10Gbps,Multi-mode,850nm,LC,300m,DDMI
942999852	MTS-SFP-10G-LR/LC	10Gbps,Single-mode,1310nm,LC,10Km,DDMI
942999853	MTS-SFP-10G-ER/LC	10Gbps,Single-mode,1550nm,LC,40Km,DDMI
942999867	MTS-SFP-10G-TX/RJ45	SFP TX/RJ45, 10Gbps full duplex auto neg.
942999870	MTS-SFP-10G-BIDI-TypeA-LR-LC	MTS2600/2700/2800, MTS2900, MTS8000
942999871	MTS-SFP-10G-BIDI-TypeB-LR-LC	MTS2600/2700/2800, MTS2900, MTS8000
942999875	MTS-SFP-10G-ZR/LC	MTS2600/2700/2800, MTS2900, MTS8000

40G SFP module

Product Number	Product Code	Description
942999863	MTS-SFP-40G-SR/LC	40Gbps,Multi-mode,850nm,MPO,100m(OM3),150m(OM4),DDMI
942999864	MTS-SFP-40G-LR/LC	40Gbps,Single-mode,1310nm,LC,10Km,DDMI
942999872	MTS-QSFP-40G-ER/LC	MTS2900, MTS8000
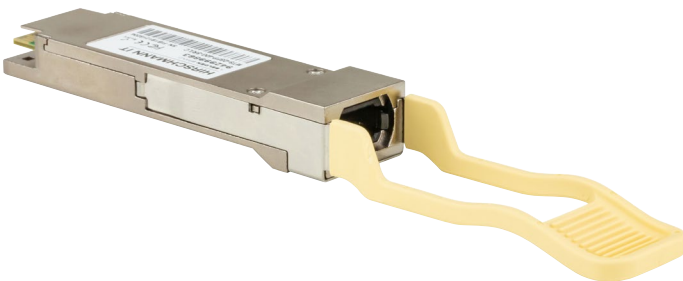
100G QSFP28

Product Number	Product Code	Description
942999876	MTS-SFP-100G-SR	Mutil-mode,850nm,MPO,70m(OM3),100m(OM4),DDMI,100GBASE-SR4
942999877	MTS-SFP-100G-LR/LC	Single-mode,WDM:1295.53-1309.14nm,LC,10Km,DDMI,100GBASE-LR4
942999878	MTS-Cable-100G-3M	AOC Cable muti-mode,850nm,DDMI,3m

SFP Applicable Matrix

#		Applicable Matrix*		MTS2600 Series Switch 10G SFP+ port	MTS2700 Series Switch 10G SFP+ port	MTS2800 Series Switch 1G SFP port	MTS2800 Series Switch 10G SFP+ port	MTS2900 Series Switch 10G SFP+ port	MTS2900 Series Switch 40G QSFP port	MTS8000 Series Switch 1G SFP port	MTS8000 Series Switch 10G SFP+ port	MTS8000 Series Switch 40G QSFP port	MTS8000 Series Switch 100G QSFP28 port	RAVEN Series Products 1G SFP port	RAVEN Series Products 10G SFP+ port	RAVEN Series Products 40G QSFP port	MTR3600 Series Router 1G SFP port
1	100M SFP Module	942999873	MTS-SFP-100M-MM/LC			●				●							●
2		942999874	MTS-SFP-100M-SM/LC			●				●							●
3		942999879	MTS-SFP-100M-LX/LC			●				●							●
4	1G SFP Module	942999854	MTS-SFP-1G-TX/RJ45			●		●		●	●			●			
5		942999855	MTS-SFP-1G-SX/LC	●	●	●	●	●		●	●			●			●
6		942999856	MTS-SFP-1G-LX/LC	●	●	●	●	●		●	●			●			●
7		942999857	MTS-SFP-1G-LX+/LC	●	●	●	●	●		●	●			●			●
8		942999858	MTS-SFP-1G-LH/LC	●	●	●	●	●		●	●			●			●
9		942999859	MTS-SFP-1G-LH+/LC	●	●	●	●	●		●	●			●			●
10		942999860	MTS-SFP-1G-BIDI-TypeA-LX/LC	●	●	●	●	●		●	●			●			●
11		942999861	MTS-SFP-1G-BIDI-TypeB-LX/LC	●	●	●	●	●		●	●			●			●
12		942999862	MTS-SFP-1G-LX+/LC-1550	●	●	●	●	●		●	●			●			●
13	10G SFP Module	942999851	MTS-SFP-10G-SR/LC	●	●		●	●			●				●		
14		942999852	MTS-SFP-10G-LR/LC	●	●			●			●				●		
15		942999853	MTS-SFP-10G-ER/LC	●	●		●	●			●				●		
16		942999867	MTS-SFP-10G-TX/RJ45					●			●				●		
17		942999870	MTS-SFP-10G-BIDI-TypeA-LR-LC		●		●	●			●				●		
18		942999871	MTS-SFP-10G-BIDI-TypeB-LR-LC		●		●	●			●				●		
19		942999875	MTS-SFP-10G-ZR/LC		●		●	●			●				●		
20	40G SFP Module	942999863	MTS-SFP-40G-SR/LC						●			●				●	
21		942999864	MTS-SFP-40G-LR/LC						●			●				●	
22		942999872	MTS-QSFP-40G-ER/LC						●			●				●	
23	100G QSFP28 Module	942999876	MTS-SFP-100G-SR										●				
24		942999877	MTS-SFP-100G-LR/LC										●				
25		942999878	MTS-Cable-100G-3M										●				

* Marked with point means the SFP can be used in the port of certain type of Hirschmann IT products and blank means the SFP cannot.

Stacking Cable

10G Stacking Cable

Product Number	Product Code	Description
942999868	MTS-Cable-10G-1M	10G Stacking Cable, 1M, Including 2*SFP+ Connectors
942999869	MTS-Cable-10G-3M	10G Stacking Cable, 3M, Including 2*SFP+ Connectors

40G Stacking Cable

Product Number	Product Code	Description
942999865	MTS-Cable-40G-1M	40G Stacking Cable, 1M, Including 2*QSFP Connectors
942999866	MTS-Cable-40G-3M	40G Stacking Cable, 3M, Including 2*QSFP Connectors

100G Stacking Cable

Product Number	Product Code	Description
942999878	MTS-Cable-100G-3M	100G Stacking Cable, 3M, Including 2*QSFP28 Connectors

Other Accessories

Copper Cable & Connectivity[①]

	Product Type	Product Number	Description	Application
	Category Cable	7814ANH 006A305M	CAT6 U/UTP Cable 24AWG, LSZH, Blue, 305M	Premise Horizontal Cable, Gigabit Ethernet, 100BaseTX, 100BaseVG ANYLAN, 155ATM, 622ATM, NTSC/PAL Component or Composite Video, AES/EBU, Digital Video, RS-422, 250MHz Category 6 and PoE application.
	Patch Cord	C6P4106001M	CAT6 Patch Cord UTP 24AWG LSZH, BLUE, 1M	Horizontal and building cabling. Support current and future Category 6 and 5e applications, such as 1000Base-T (Gigabit Ethernet), 100Base-T, 10Base-T, FDDI, ATM
	Patch Panel	AP106503	KeyConnect Universal Patch Panel with shutter, 24 port, 1U, Black(Empty)	Compatible with a variety of modules that are suitable for use with Belden IBDN Systems 10GX, 4800, 3600, 2400 and 1200.
	Modular Jack	AX101321	CAT6 Modular Jack, Black	Applicable for IBDN Systems 2400, 3600 and 4800, TIA Category 6+, ISO Class E, 1000 BASE-T

Other Accessories

Fiber Cable & Connectivity [1]

Product Type	Product Number	Description	Application
Patch Cord	PFSLDLD002MR2XY	Fiber Patch Cord, OS2 LC-LC Duplex, Riser, Yellow, 2M	Applicable for Data Centers, Main Equipment Rooms, Telecommunications Rooms and Work Area.
	PF3LDLD002MR2XA	Fiber Patch Cord, OM3 LC-LC Duplex, Riser, Aqua, 2M	
Patch Panel	AP100046	1U Multipurpose with 24 Keystone ports(Empty)	Accommodate a variety of fiber connectors and terminated to fiber cables using splicing or other methods. Typically used in Server rooms, Network rooms, Data Centers and Small offices. Can be mounted directly on any 19″ rack or cabinet.
KeyConnect Fiber LC Duplex Adapter Modules	AP100020BK	KeyConnect LC Duplex Senior Type Fiber adapter module Single Mode	FiberExpress Solutions, Backbone, Telecommunications Room, Main Distribution Room.
	AP100023BK	Keyconnect LC Duplex Senior Type fiber adapter module MM OM3	

Rack & Cabinet [1]

Product Type	Product Number	Description	Application
Rack & Cabinet	ADN4282PVCC2BA	800KG, Networking Distribution Cabinet, 42U,800(W)* 1200(D), Black	Applicable for 19" Data, Telecommunications, LAN and Server. Varying depths are available for customer specific requirements.

[1] Typical Product Numbers Listed Only. Please Approach Your Sales Representative for More Enterprise Products.

Demand Driven Innovation

Your needs are our drivers of innovation. That's not merely a promise; our continuous investment in innovation is clearly demonstrated by our numerous patents. Through ongoing research and development,we are committed to providing you with the best solutions. As a market leader, we also play an active role in key industry associations around the world – thus helping to develop standardization for global applications and products. We are active in IEC, IEEE, ODVA, PNO, EPSG, as well as numerous manufacturer-independent organizations. All this with just one goal: being able to deliver you that specific solution you need; today as well as tomorrow.

Durable Solution: GreenChoice

A perfect example of market driven innovation is GreenChoice; our answer to the increasing demand for greener and more sustainable solutions. Focusing on reducing the ecological impact of our products has led to our most durable product range ever. Numerous Belden products are now available as GreenChoice products, giving you the opportunity to make responsible choices.

Partner Network

Working with us means working with our committed partner network, across all Belden brands. We combine our resources, intelligence and skills to take Belden products and solutions to the next level.

Ten Clear Benefits and Promises

At Belden every new challenge is considered unique, whether a standard solution is sufficient or a customized solution is needed. Whenever necessary, we adapt our products and services to your requirements and demands. Although flexibility is key, there are always ten clear benefits that you can rely on. They underlie the way we work, regardless of a project's size or nature. These are our ten most important benefits to you:

1 A wide range of standard and tailored signal transmission solutions from one single source.

2 Hassle-free and secure signal transmissions under the toughest conditions.

3 Reducing total cost of ownership.

4 Best-in-class products with proven superior performance.

5 Reliability for maximum uptime and minimum maintenance.

6 Fast delivery of solutions and ease of installation.

7 Local technical support backed by extensive global resources.

8 Belden and Hirschmann: brands with a long history and an excellent reputation.

9 Design support and innovation.

10 Continued analysis of market needs for continuous development of effective solutions.

Get in Touch or Better Yet... Challenge Us

We invite you to put us to the test. Make your next challenge our success. We're looking forward to providing you with a superior solution that will open a whole new range of opportunities, both technological and business-wise.

Please call or mail your contact person at Belden and we'll be certain to make an appointment.

BELDEN

Headquarters

Global
Belden St. Louis
1 N. Brentwood Blvd. 15th Floor
St. Louis MO 63105 US
Phone:+314-854-8000
Fax:+314-854.8001
info@belden.com

Division Headquarters - Americas
Belden - Richmond
2200 U.S. Highway 27 South
Richmond, IN47374 US
Phone: 765.983.5200
Toll Free: 1-800-BELDEN1
Fax: +765-983-5294
info@belden.com

Division Headquarters - Europe
Belden - EMEA
Edisonstraat 9, Postbus 9
5928 PGVenlo, 5900 AA The
Netherlands
Phone:+31-773-878-555
Fax: +31-773-878-448
venlo.salesinfo@belden.com

Division Headquarters - Asia Pacific
Belden - Hong Kong
7/F Harbour View 2 16 Science Park
East Avenue Hong Kong Science Park,
Shatin Hong Kong
Phone: +852-2955-0128
Fax: +852-2907-6933
hongkong.sales@belden.com

Asia Pacific

ANZ Region
Australia
Level 40, 140 William Street,
Melbourne, Victoria 3000,
Australia
Phone: 1800-500-775
australia.sales@belden.com

China Region
Beijing
Room 2507, 25/F Jintai Building
No.1 Xi Bahe Southern Road
Chaoyang District Beijing
People's Republic of China
Phone: +86-10-6591-8801
Fax: +86-10-6591-8933
china.marketing@belden.com

Shanghai
24/F, Building C,
No.900 YiShan Road
Caohejing High-Tech Park
Shanghai 200233
People's Republic of China
Phone: +86-21-3418-2688
Fax: +86-21-5445-2366/77
china.marketing@belden.com

Shenzhen
Rm 809, 8/F, New World Center
No.6009 Yitian Road
Fu Tian District
Shenzhen 518035
People's Republic of China
Phone: +86-755-2398-0778
Fax: +86-755-2398 0578
china.marketing@belden.com

Suzhou
333 Yanhu Road, Huaqiao Town
Kunshan City, Jiangsu Province Suzhou
215332, Jiangsu Province People's
Republic of China
Phone: +86-512-5796-1688
Fax: +86-512-5796-1222
china.marketing@belden.com

India Region
Bengaluru
Vaswani Presidio, 6th Floor
56 Panathur Rd, New Kaverappa
Layout, Kadubeesanahalli, Panathur
Bengaluru, Karnataka, India 560103
Phone: +91-80-6703-7800
india.sales@belden.com

Gurugram
Unit No :233-236, 2nd Floor, Spazedge,
Tower B, Sohna Road, Sector 47,
Gurugram Haryana 122002
Phone: +91-124-450-9999
Fax: +91-124-450-9900
india.sales@belden.com

Mumbai
Unit 2001 to 2003, 20th Floor, Kailas
Business Park, A Wing,
Veersawarkar Road, Vikhroli (W)
Mumbai 400079
India
Phone: +91-022-400-98200
india.sales@belden.com

Pune
Plot No D-228/1
Chakan MIDC Phase II
Village Bhamboli, TalKhed
District-Pune, Maharashtra
India 410507
Phone: +91-21-3563-8791
Fax: +91-21-3563-8790
india.sales@belden.com

NA Region
Japan
Level 3, Marunouchi Nijubashi Building,
3-2-2 Marunouchi Chiyoda-ku
Tokyo 100-0005 Japan
Phone: +03-6837-9613
japan.sales@belden.com

South Korea
505 KD Tower,
Wangsimni-ro 125,
Seongdong-gu,
Seoul, Republic of Korea
korea.sales@belden.com

SEA Region
Indonesia
Puri Indah Financial Tower,
Sue 805 Jl. Puri Indah Raya Blok T
No.8, RT.1/RW.2,
Kec. Kembangan, Jakarta Barat,
JAKARTA 11610 - Indonesia
Phone: +62-21-5799-3466
Fax: +62-21-5748-8888
indonesia.sales@belden.com

Malaysia
Suite 03-02, Level 3, Tower A
Vertical Business Suite
Bangsar South City
No. 8 Jalan Kerinchi
Kuala Lumpur 59200
Malaysia
Phone: +603-2247-1898
malaysia.sales@belden.com

Philippines
One Global Place Level 10-1
25th Street & 5th Street
Bonifacio Global City,
Taguig Philippines
Phone: +632-3224-2029
philippines.sales@belden.com

Singapore
151 Lorong Chuan
#05-01 New Tech Park
Singapore 556741
Phone: +65-6879-9800
singapore.sales@belden.com

Thailand
No. 3 Promphan 3 Building
UNIT 1725,17th Floor, Soi Lad Phrao 3
Chomphon Sub-District, Chatuchak
District Bangkok 10900
Thailand
Phone: +66-2026-0525
Fax: +66-2024-6767
thailand.sales@belden.com

Vietnam
S007, Floor 5, CJ Building,
2bis-4-6 Le Thanh Ton street,
Ben Nghe ward, District 1,
Ho Chi Minh City, Vietnam
Phone: +84 28 6255 6800
Fax: +84 28 6255 6802
vietnam.sales@belden.com

Contact us