



Switching Engineered for AV over IP

The NETGEAR M4250 Switch Series introduces the AV Line, developed and engineered for audio/video professionals with dedicated service and support. M4250 has been built from the ground up for the growing AV over IP market, combining years of networking expertise in AV with M4300 and M4500 series with best practices from leading experts in the professional AV market. AV codecs

generally use 1Gbps or 10Gbps per stream and the AV Line of M4250 targets the widespread 1Gbps codecs.

PoE+, Ultra90 PoE++ and rear-facing ports ensure a clean integration in AV racks. M4250 switches come pre-configured for standard audio and video signals. When requirements are more specific, an AV user interface offers customization with port-based profiles. For audio Dante,

Q-SYS and AES67 profiles are available, as well as an AVB profile requiring an AVB license sold separately. For video the M4250 offers profiles for NVX, SVSI, Q-SYS, NDI, Dante etc. as well as audio/video/control mixed profiles. When multiple switches, NETGEAR IGMP Plus™ brings automation for you to just connect them together, or with M4300 and M4500 switches.

Highlights

Extended AV features

- Dedicated AV web-based GUI interface for more specific AV installations
- Color-based AV profiles can be applied to the different ports
- Dante, Q-SYS, AES67 and AVB audio profiles
- AVB requires a license (sold separately)
- NVX, SVSI, Q-SYS, NDI and Dante video profiles
- Audio / video / control mixed profiles
- Automatic switch interconnect with NETGEAR IGMP Plus™
- Common Layer 2 and Layer 3 switching engine across all M4250 models

- Built-in IT web GUI, console, telnet and SSH consistent with other NETGEAR M4300 and M4500 series
- Feature set includes static, RIP and PIM routing, DHCP Server and PTPv2

Audio Video Bridging (AVB) services

- AVB is one of the many features designed into the M4250 product line
- AVB is an industry standard for transporting content over a network
- AVB is used most often when very low latency is required such as in live performances when lip sync is critical
- All of the AV Line M4250 switches can be optionally licensed for AVB support

Other IT use cases

- Standard or recessed mounting with all ports in the back, or all ports in the front

- Fully featured L2/L3/L4 platform for midsize Enterprise campus networks, IoT and IPTV

Industry standard management

- Industry standard command line interface (CLI), main NETGEAR IT web interface (GUI), SNMP, sFlow and RSPAN
- Single-pane-of-glass NMS300 management platform with centralized firmware updates and mass-configuration support

Industry leading warranty

- NETGEAR M4250 series is covered under NETGEAR ProSAFE Limited Lifetime Hardware Warranty*
- 90 days of Technical Support via phone and email, Lifetime Technical Support through online chat and Lifetime Next Business Day hardware replacement

Hardware-at-a-Glance

| Model Name | Form-Factor | Switching Fabric | REAR (REVERSIBLE)* | | | | PSU | LEDs | MANAGEMENT | Model Number |
|--------------------|-------------------------------------|------------------|---|---------------------------------|----------------------|----------------------------|--|---|---|--------------|
| | | | 10/100/1000 BASE-T RJ45 ports | 100/1000/2.5G BASE-T RJ45 ports | 1000BASE-X SFP ports | 1000/10G BASE-X SFP+ ports | | | | |
| M4250-10G2F-PoE+ | 1U rack mount 440 x 43.2 x 200mm | 24 Gbps | 8 ports PoE+ (125W) 2 additional ports 10M, 100M, 1G | - | 2 ports SFP 1G | - | Fixed (C14 connector) Power switch (On/Off) | Available both in front and in the rear: Power LED PoE Max LED (PoE models) Fan LED Port LEDs | Ethernet: 1G Out-of-band (Rear) Console: RJ45 RS232 (Rear) Console: USB-C (Rear) Storage: USB-A (Front) LED Ext: USB-C (Front) | GSM4212P |
| M4250-10G2XF-PoE+ | 1U rack mount 440 x 43.2 x 200mm | 60 Gbps | 8 ports PoE+ (240W) 2 additional ports 10M, 100M, 1G | - | - | 2 ports SFP+ 1G, 10G | | | | GSM4212PX |
| M4250-10G2XF-PoE++ | 1U rack mount 440 x 43.2 x 257mm | 60 Gbps | 8 ports PoE++** (720W) 2 additional ports 10M, 100M, 1G | - | - | 2 ports SFP+ 1G, 10G | | | | GSM4212UX |
| M4250-12M2XF | 1U rack mount 440 x 43.2 x 100mm | 100 Gbps | - | 12 ports 100M, 1G, 2.5G | - | 2 ports SFP+ 1G, 10G | | | | MSM4214X |
| M4250-16XF | 1U rack mount 440 x 43.2 x 200mm | 320 Gbps | - | - | - | 16 ports SFP+ 1G, 10G | | | | XSM4216F |

* Reversed mounting is possible when ports are desired on the front of the rack by using the standard rackmount ears, or the included alternate rackmount ears to mount the switch recessed by 2-Inches to allow for the cabling.

** Ultra90 PoE++ 802.3bt is compatible with 802.3af PoE (15.4W), 802.3at PoE++ (30W) and 802.3bt (60W, 75W and 90W).

Acoustic-at-a-Glance

| Model Name | FAN OFF MODE Setting / maximum loading* | | | | | QUIET MODE Setting at 25°C ambient** | | | | | COOL MODE Setting at 25°C ambient** | | | Model Number |
|--------------------|---|---------|---------|----------------|------------------------------|--|----------------------|--|--------------------------------------|---|-------------------------------------|-----------------|----------|--------------|
| | Fanless State | Ambient | Sensor | PoE Power Load | Conditions | PoE Power Load | Fan Duty | Sensor | Case Temp (Top) | Acoustic | Fan Duty | Case Temp (Top) | Acoustic | |
| M4250-10G2F-PoE+ | 0dBA / 41.8°C Case Temp | 25°C | <= 42°C | 80W | All ports can be used | 125W | 25 | <= 36°C | 35.9°C | 27.38dBA | 100 | 27.2°C | 55dBA | GSM4212P |
| M4250-10G2XF-PoE+ | 0dBA / 39.6°C Case Temp | 25°C | <= 44°C | 90W | All ports can be used | 240W | 25 | <= 37°C | 40.6°C | 27.4dBA | 100 | 30.9°C | 56dBA | GSM4212PX |
| M4250-10G2XF-PoE++ | 0dBA / 44.6°C Case Temp | 25°C | <= 67°C | 45W | All ports can be used | 0-250W 250-380W 380W-500W 500W-720W | 25 30 35 40 | <= 49°C <= 49°C <= 49°C <= 49°C | 42.9°C 43.3°C 44.9°C 52.1°C | 34.57dBA 40dBA 44.22dBA 47.19dBA | 100 | 41.8°C | 66.23dBA | GSM4212UX |
| M4250-12M2XF | 0dBA / 56°C Case Temp | 25°C | <= 64°C | - | 8 ports 2.5G (no SFP+) | - | 25 | <= 58°C | 53.5°C | 28.5dBA | 100 | 33.2°C | 55dBA | MSM4214X |
| M4250-16XF | 0dBA / 41.3°C Case Temp | 25°C | <= 78°C | - | 8 ports SFP+ | - | 25 | <= 67°C | 41.6°C | 27.44dBA | 100 | 30.3°C | 57dBA | XSM4216F |

* Software-controlled fan adjustments enable the fans to be turned off when ambient temperature and PoE loads are appropriate for a totally fanless operation.

** dBA values are SPL (Sound Pressure Level) values, testing following the ISO-7779 standard. Bystander Mode. Chamber Temp 25°C during testing. Full, 100%, Data and PoE loaded. Worst case.

Software-at-a-Glance

| LITE LAYER 3 PACKAGE | | | | | | | | | | | | |
|----------------------|--------------------------------|--|--|--|---|--|--|---|---|--|---|--------------|
| Model Name | Management | AV Dedicated UI | IPv4 / IPv6 ACL and QoS, DiffServ | IPv4 / IPv6 Multicast Filtering | IPv4 / IPv6 Policing and Convergence | Spanning Tree Green Ethernet | VLANs | Trunking Port Channel | IPv4 / IPv6 Authentication Security | IPv4 / IPv6 Static Routing | IPv4 / IPv6 Dynamic Routing | Model Number |
| M4250 series | Out-of-band | AV web-based GUI available at [Switch IP Address]:8080 | Ingress/egress 1 Kbps shaping Time-based Single Rate Policing | NETGEAR IGMP™ Plus for automated IGMP between switches IGMPv3 MLDv2 Snooping, Proxy ASM & SSM IGMPv1,v2 Querier (compatible v3) Control Packet Flooding | Auto-VoIP | STP, MTP, RSTP PV(R)STP BPDU/STRG Root Guard EEE 802.3az (EEE is disabled by default) | Static, Dynamic, Voice, MAC GVRP/ GMRP Double VLAN mode Private VLANs | Static LAG, or Dynamic LACP (LACP automatically reverts to and from Static LAG) Seven (7) L2/L3/L4 hashing algorithms | Successive Tiering (DOT1X; MAB; Captive Portal) DHCP Snooping Dynamic ARP Inspection IP Source Guard | Port, Subnet, VLAN routing Multicast static routes DHCPv4 Server DHCP Relay Stateful DHCPv6 Server | IPv4: RIP IPv4/IPv6: PIM-SM PIM-DM SSM | All models |
| | IT Web GUI (main) | Designed for AV installers | | | Policy-based routing (PBR) | | | | | | | |
| | HTTPs CLI; Telnet; SSH | AV-related controls | | | LLDP-MED | | | | | | | |
| | SNMP, MIBs RSPAN | Audio over IP profiles | | | IEEE 1588 PTPv2 1-Step End-to-End Transparent Clock | | | | | | | |
| | Radius Users, TACACS+ | AVB profile* | | | AVB*: 802.1AS, 802.1Qav, 802.1Qat MSRP, 802.1ak MMRP, 802.1ak MVRP | | | | | | | |
| | | Video over IP profiles | | | | | | | | | | |
| | Mixed Audio and Video profiles | | | | | | | | | | | |

* Requires AVB license, sold separately. All other software features are available, license-free.

Performance-at-a-Glance

| TABLE SIZE | | | | | | | | | | | | | | |
|--------------------|---------------------------|-----------------------------|--------------------|-------------------------------------|---------------|---|------------------------------|---|--------------|---------------------------------|-------------|---|--|--------------|
| Model Name | MAC ARP/NDP | Routing/ Switching Capacity | Throughput 64-byte | Application Route Scaling | Packet Buffer | Latency | IP Multicast Routing Entries | CPU | Jumbo Frames | Multicast IGMP Group membership | VLANs | DHCP | sFlow | Model Number |
| M4250-10G2F-PoE+ | 16K MAC 4K ARP/ NDP | 24 Gbps Line-Rate | 17.86 Mpps | Static: 894v4/126v6 RIP: 32v4 | 16Mb | <2.27µs 1G | 512 IPv4 128 IPv6 | ARM A9 1.25Ghz 2GB RAM 256MB Flash | Up to 12K | 2K IPv4 2K IPv6 | 4K VLANs | DHCP Server: 2K leases IPv4: 256 pools IPv6: 16 pools | 16 samplers 16 pollers 8 receivers | GSM4212P |
| M4250-10G2XF-PoE+ | 16K MAC 4K ARP/ NDP | 60 Gbps Line-Rate | 44.64 Mpps | Static: 894v4/126v6 RIP: 32v4 | 16Mb | <2.14µs 1G <0.84µs 10G | | | | | | | | GSM4212PX |
| M4250-10G2XF-PoE++ | 16K MAC 4K ARP/ NDP | 60 Gbps Line-Rate | 44.64 Mpps | Static: 894v4/126v6 RIP: 32v4 | 16Mb | <1.84µs 1G <0.81µs 10G | | | | | | | | GSM4212UX |
| M4250-12M2XF | 16K MAC 4K ARP/ NDP | 100 Gbps Line-Rate | 74.40 Mpps | Static: 894v4/126v6 RIP: 32v4 | 16Mb | <2.84µs 1G <6.02µs 2.5G <0.81µs 10G | | | | | | | | MSM4214X |
| M4250-16XF | 16K MAC 4K ARP/ NDP | 320 Gbps Line-Rate | 238.08 Mpps | Static: 894v4/126v6 RIP: 32v4 | 16Mb | <1.30µs 1G <0.86µs 10G | | | | | | | | XSM4216F |

Product Brief



The NETGEAR AV Line M4250 series was designed with input from AV Professionals. The result is a line of switches built from the ground up to support 1Gb audio and video over IP with customized hardware and software along with dedicated service and support.

NETGEAR M4250 series key features:

- Ranges from 8 to 16 ports with a variety of PoE+ and Ultra90 PoE++ options for 15.4W, 30W, 60W, 75W and 90W AVoIP endpoints
- Uplink options include 1G for audio installations or standalone video installations as well as 10G uplinks for larger scale video deployments
- Also includes 12-port multi-gigabit Ethernet and 16-port 1G/10G fiber models for plug and play aggregation in a star topology
- Designed for a clean integration with traditional rack-mounted, AV equipment
- The M4250 switches come with a sleek, black display panel with status in front and all cabling plus additional status in the back
- Reversed mounting is possible when ports are desired on the front of the rack
- A second pair of rackmount ears allows the switches to be mounted recessed by 2-inches to allow for the cabling

- Software-controlled fan adjustments enable the fans to be turned off when ambient temperature and PoE loads are appropriate for a totally fanless operation
- Threaded holes on the bottom (4xM5 for 50x100mm VESA) and in front (1xM10 for clamps) allow for universal mounting options outside the rack as well

NETGEAR M4250 series AV software features:

- Pre-configured for audio and video over IP out of the box, the M4250 switches enable encoders and decoders to be connected with zero configuration
- When more configuration is required, an AV web-based GUI is available at the switch IP address:8080
- This interface has been specially designed for AV installers with specific AV-related controls made more accessible and with port-based profiles
- For audio, profiles for Dante, Q-SYS and AES67 are built-in, as well as an AVB profile (AVB license sold separately)

- For video, the M4250 offers profiles for NVX, SVSI, Q-SYS, NDI, Kramer KDS, Aurora Multimedia, ZeeVee, Atlona, Dante and SDVoE
- Other AV CODECs and manufactures are supported as well as audio/video/control mixed profiles
- To further simplify star deployments, NETGEAR IGMP Plus™ brings multicast automation between all M4250 switches, and with M4300/M4500
- Simply connect the switches together and you are done!

NETGEAR M4250 series other software features:

- All M4250 switches share the same high-end NETGEAR Layer 2 / Layer 3 switching engine for a consistent experience
- All switches in the M4250 series have another main, IT web-based GUI for midsize Enterprise campus networks, IoT and IPTV

- Additional features include static, RIP and PIM-SM, DM and SSM multicast routing, DHCP Server and PTPv2 Transparent Clock (1-step E2E)
- AVB is the only feature requiring a license, all other advanced features are available license-free
- Advanced classifier-based, time-based hardware implementation for L2 (MAC), L3 (IP) and L4 (UDP/TCP transport ports) security and prioritization
- Selectable Port-Channel / LAG (802.3ad - 802.1AX) L2/L3/L4 hashing for fault tolerance and load sharing with any type of Ethernet channeling
- Voice VLAN with SIP, H323 and SCCP protocols detection and LLDP-MED IP phones automatic QoS and VLAN configuration
- Efficient authentication tiering with successive DOT1X, MAB and Captive Portal methods for streamlined BYOD
- Comprehensive IPv4/IPv6 static and dynamic routing including Policy-based routing and 6-to-4 tunneling
- Advanced IPv4/IPv6 security implementation including malicious code detection, DHCP Snooping, IP Source Guard protection and DoS attacks mitigation

NETGEAR M4250 series management features:

- DHCP/BootP innovative auto-installation including firmware and configuration file upload automation
- Industry standard SNMP, RMON, MIB, LLDP, AAA, sFlow, RSPAN and PTPv2
- Service port for out-of-band Ethernet management (OOB)
- Standard RS232 straight-through serial RJ45 and USB Type-C ports for local management console
- Standard USB-A port for local storage, logs, configuration or image files
- Dual firmware image for updates with minimum service interruption
- Single-pane-of-glass NMS300 management platform with mass configuration support
- Industry standard command line interface (CLI) for IT admins used to other vendors commands
- Fully functional Web console (main GUI) for IT admins who prefer an easy to use graphical interface
- Dedicated AV web-based GUI interface available at [switch IP address:8080] for AV installations

NETGEAR M4250 series warranty and support:

- NETGEAR ProSAFE Limited Lifetime Hardware Warranty**
- Included Lifetime Technical Support
- Included Lifetime Next Business Day Hardware Replacement
- Offering free network design services and installation support, the NETGEAR Engineering Services Team is ready to help ensure your 1G deployments with the M4250 AV over IP switches go as smooth as possible. Just drop us an email at ProAVDesign@netgear.com to get started!

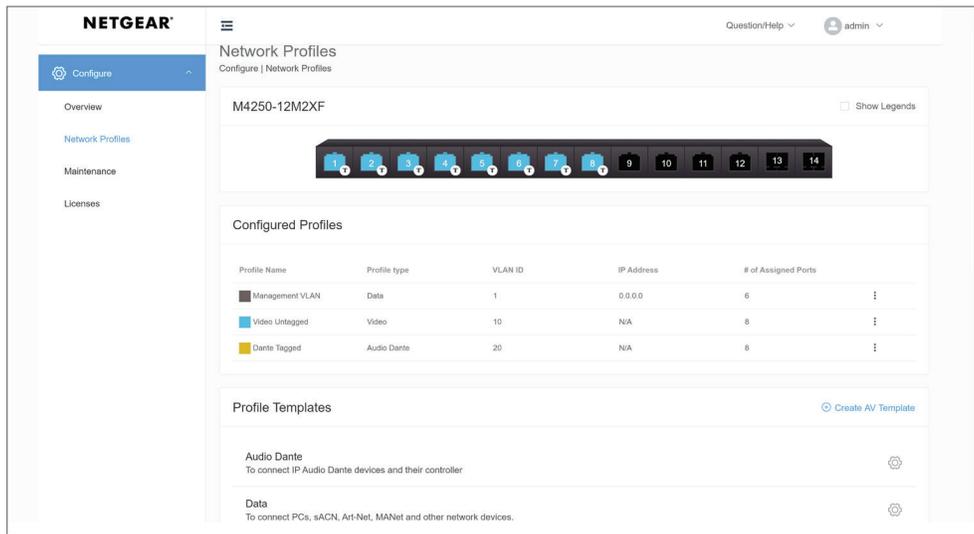


Features highlights

Dedicated AV UI available at <http://IPAddress:8080>

M4250 switch series is pre-configured for Audio and Video over IP out of the box with a dedicated AV web-based GUI interface for more specific AV installations

- Color-based AV profiles can be applied to the different ports
- Dante, Q-SYS, AES67 and AVB audio profiles (AVB license sold separately)
- NVX, SVSI, Q-SYS, NDI, Kramer KDS, Aurora Multimedia, ZeeVee, Atlon, Dante, etc. video profiles
- Audio / video / control mixed profiles



Best value switching performance:

16K MAC address table, 4K ARP and 4K concurrent VLANs for typical midsize environments

Low latency at all network speeds, including 10 Gigabit fiber interfaces

Jumbo frames support of up to 12KB accelerating performance with compatible nodes

Ranges from 8 to 16 ports with a variety of PoE+ and Ultra90 PoE++ 802.3bt options for 15.4W, 30W, 60W, 75W and 90W AVoIP (1G) endpoints

Tier 1 availability

Rapid Spanning Tree (RSTP) and Multiple Spanning Tree (MSTP) allow for rapid transitioning of the ports to the Forwarding state and the suppression of Topology Change Notification

NETGEAR PVSTP implementation follows the same rules than other vendor's Per VLAN STP for strict interoperability

- Including industry-standard PVST+ interoperability
- PVSTP is similar to the MSTP protocol as defined by IEEE 802.1s, the main difference being PVSTP runs one instance per VLAN
- In other words, each configured VLAN runs an independent instance of PVSTP
- FastUplink feature immediately moves an alternate port with lowest cost to forwarding state when the root port goes down to reduce recovery time
- FastBackbone feature selects new indirect port when an indirect port fails

NETGEAR PVRSTP implementation follows the same rules than other vendor's Per VLAN RSTP for strict interoperability

- Including industry-standard RPVST+ interoperability
- PVRSTP is similar to the RSTP protocol as defined by IEEE 802.1w, the main difference being PVRSTP runs one instance per VLAN
- In other words, each configured VLAN runs an independent instance of PVRSTP
- Each PVRSTP instance elects a root bridge independent of the other
- Hence there are as many Root Bridges in the region as there are VLANs configured
- Per VLAN RSTP has in built support for FastUplink and FastBackbone

IP address conflict detection performed by embedded DHCP servers prevents accidental IP address duplicates from perturbing the overall network stability

IP Event Dampening reduces the effect of interface flaps on routing protocols: the routing protocols temporarily disable their processing (on the unstable interface) until the interface becomes stable, thereby greatly increasing the overall stability of the network

Ease of deployment

Automatic configuration with DHCP and BootP Auto Install eases large deployments with a scalable configuration files management capability, mapping IP addresses and host names and providing individual configuration files to multiple switches as soon as they are initialized on the network

Both the Switch Serial Number and primary MAC address are reported by a simple "show hardware" command in CLI - facilitating discovery and remote configuration operations

M4300 DHCP L2 Relay agents eliminate the need to have a DHCP server on each physical network or subnet

- DHCP Relay agents process DHCP messages and generate new DHCP messages
- Supports DHCP Relay Option 82 circuit-id and remote-id for VLANs
- DHCP Relay agents are typically IP routing-aware devices and can be referred to as Layer 3 relay agents

Automatic Voice over IP prioritization with Auto-VoIP simplifies most complex multi-vendor IP telephones deployments either based on protocols (SIP, H323 and SCCP) or on OUI bytes (default database and user-based OUIs) in the phone source MAC address; providing the best class of service to VoIP streams (both data and signaling) over other ordinary traffic by classifying traffic, and enabling correct egress queue configuration

An associated Voice VLAN can be easily configured with Auto-VoIP for further traffic isolation

When deployed IP phones are LLDP-MED compliant, the Voice VLAN will use LLDP-MED to pass on the VLAN ID, 802.1P priority and DSCP values to the IP phones, accelerating convergent deployments

Ease of management and granular control

Dual firmware image and dual configuration file for transparent firmware updates / configuration changes with minimum service interruption

Flexible Port-Channel/LAG (802.3ad - 802.1AX) implementation for maximum compatibility, fault tolerance and load sharing with any type of Ethernet channeling from other vendors switch, server or storage devices conforming to IEEE 802.3ad - including static (selectable hashing algorithms) - or to IEEE 802.1AX with dynamic LAGs or port-channel (highly tunable LACP Link Aggregation Control Protocol)

LACP mode automatically reverts to and from Static LAG, useful when the host isn't LACP anymore, for instance during a factory reset or re-configuration

Unidirectional Link Detection Protocol (UDLD) and Aggressive UDLD detect and avoid unidirectional links automatically, in order to prevent forwarding anomalies in a Layer 2 communication channel in which a bi-directional link stops passing traffic in one direction

Port names feature allows for descriptive names on all interfaces and better clarity in real word admin daily tasks

SDM (System Data Management, or switch database) templates allow for granular system resources distribution depending on IPv4 or IPv6 applications

- ARP Entries (the maximum number of entries in the IPv4 Address Resolution Protocol ARP cache for routing interfaces)
- IPv4 Unicast Routes (the maximum number of IPv4 unicast forwarding table entries)
- IPv6 NDP Entries (the maximum number of IPv6 Neighbor Discovery Protocol NDP cache entries)
- IPv6 Unicast Routes (the maximum number of IPv6 unicast forwarding table entries)
- ECMP Next Hops (the maximum number of next hops that can be installed in the IPv4 and IPv6 unicast forwarding tables)
- IPv4 Multicast Routes (the maximum number of IPv4 multicast forwarding table entries)
- IPv6 Multicast Routes (the maximum number of IPv6 multicast forwarding table entries)

Loopback interfaces management for routing protocols administration

Private VLANs and local Proxy ARP help reduce broadcast with added security

Management VLAN ID is user selectable for best convenience

Industry-standard VLAN management in the command line interface (CLI) for all common operations such as VLAN creation; VLAN names; VLAN "make static" for dynamically created VLAN by GVRP registration; VLAN trunking; VLAN participation as well as VLAN ID (PVID) and VLAN tagging for one interface, a group of interfaces or all interfaces at once

Simplified VLAN configuration with industry-standard Access Ports for 802.1Q unaware endpoints and Trunk Ports for switch-to-switch links with Native VLAN

System defaults automatically set per-port broadcast, multicast, and unicast storm control for typical, robust protection against DoS attacks and faulty clients which can, with BYOD, often create network and performance issues

IP Telephony administration is simplified with consistent Voice VLAN capabilities per the industry standards and automatic functions associated

Comprehensive set of "system utilities" and "Clear" commands help troubleshoot connectivity issues and restore various configurations to their factory defaults for maximum admin efficiency: traceroute (to discover the routes that packets actually take when traveling on a hop-by-hop basis and with a synchronous response when initiated from the CLI), clear dynamically learned MAC addresses, counters, IGMP snooping table entries from the Multicast forwarding database etc...

Syslog and Packet Captures can be sent to USB storage for rapid network troubleshooting

Replaceable factory-default configuration file for predictable network reset in distributed branch offices without IT personnel

All major centralized software distribution platforms are supported for central software upgrades and configuration files management (HTTP, TFTP), including in highly secured versions (HTTPS, SFTP, SCP)

Simple Network Time Protocol (SNTP) can be used to synchronize network resources and for adaptation of NTP, and can provide synchronized network timestamp either in broadcast or unicast mode (SNTP client implemented over UDP - port 123)

Embedded RMON (4 groups) and sFlow agents permit external network traffic analysis

Engineered for convergence and AV-over-IP

Audio (Voice over IP) and Video (multicasting) comprehensive switching, filtering, routing and prioritization

Auto-VoIP, Voice VLAN and LLDP-MED support for IP phones QoS and VLAN configuration

IEEE 1588 (section 10 and 11.5) PTPv2 Transparent Clock (TC) End-to-End implementation considering the residence time of PTPv2 packets from ingress to egress

- 1-step Transparent Clock mode, using the residence time of the PTPv2 packet at the egress port level in Standalone mode, or Stack Master only
- The "Sync & Delay_Req" field of passing/egressing out PTPv2 packets is updated with the residence time in the switch, the other fields in PTPv2 packets ("Announce", "Delay_Resp", "Pdelay_Req" and "Pdelay_Resp") are not updated

NETGEAR IGMP Plus™ for automatic multicast across a M4250 / M4300 / M4500 L2 network (Spine and Leaf topologies), removing the need for L3 PIM routing

- IGMP Plus is pre-configured on default VLAN 1 out of the box
- IGMP Plus can be configured on another VLAN for automatic IGMP across switches on that VLAN (uplinks can make part of that VLAN in trunk mode)
- IGMP Plus allow AV-over-IP devices (TX/Encoders and RX/Decoders) to be connected across multiple switches in a star topology
- The `show igmpsnoping group` command in CLI and GUI displays the Source and Group IP addresses along with their corresponding MAC addresses that are learnt through IGMP Snooping in a given VLAN on a given interface

IGMP Snooping and Proxy for IPv4, MLD Snooping and Proxy for IPv6, and Querier mode facilitate fast receivers joins and leaves for multicast streams and ensure multi-cast traffic only reaches interested receivers everywhere in a Layer 2 or a Layer 3 network, including source-specific (SSM) and any-source (ASM) multicast

Multicast VLAN Registration (MVR) uses a dedicated Multicast VLAN to forward multicast streams and avoid duplication for clients in different VLANs

Multicast routing (PIM-SM and PIM-DM, both IPv4 and IPv6) ensure multicast streams can reach receivers in different L3 subnets

PoE power management and schedule enablement for powering on and powering off PoE nodes connected to the switch

AVB is one of the many features designed into the M4250 product line

- IEEE 802.1BA-2011 Audio Video Bridging (AVB) when an AVB license is properly installed in the switch (license sold separately)
- IEEE 802.1AS-2011 gPTP, IEEE 802.1Qav-2009 FQTS, IEEE 802.1Qat-2010 MSRP, IEEE 802.1ak MMRP, IEEE 802.1ak MVRP
- Maximum of 256 AVB streams per switch
- AVB is not supported in LAG (link aggregation groups, or Etherchannel)

Layer 3 routing package

Static Routes/ECMP Static Routes for IPv4 and IPv6

- Static and default routes are configurable with next IP address hops to any given destination
- Permitting additional routes creates several options for the network administrator
- The admin can configure multiple next hops to a given destination, intending for the router to load share across the next hops
- The admin distinguishes static routes by specifying a route preference value: a lower preference value is a more preferred static route
- A less preferred static route is used if the more preferred static route is unusable (down link, or next hop cannot be resolved to a MAC address)

Advanced Static Routing functions for administrative traffic control

- Static Reject Routes are configurable to control the traffic destined to a particular network so that it is not forwarded through the router
- Such traffic is discarded and the ICMP destination unreachable message is sent back to the source
- Static reject routes can be typically used to prevent routing loops
- Default routes are configurable as a preference option

In order to facilitate VLAN creation and VLAN routing using Web GUI, a VLAN Routing Wizard offers following automated capabilities:

- Create a VLAN and generate a unique name for VLAN
- Add selected ports to the newly created VLAN and remove selected ports from the default VLAN
- Create a LAG, add selected ports to a LAG, then add this LAG to the newly created VLAN
- Enable tagging on selected ports if the port is in another VLAN
- Disable tagging if a selected port does not exist in another VLAN
- Exclude ports that are not selected from the VLAN
- Enable routing on the VLAN using the IP address and subnet mask entered as logical routing interface

DHCP Relay Agents relay DHCP requests from any routed interface, including VLANs, when DHCP server doesn't reside on the same IP network or subnet

- The agent relays requests from a subnet without a DHCP server to a server or next-hop agent on another subnet
- Unlike a router which switches IP packets transparently, a DHCP relay agent processes DHCP messages and generates new DHCP messages
- Supports DHCP Relay Option 82 circuit-id and remote-id for VLANs
- Multiple Helper IPs feature allows to configure a DHCP relay agent with multiple DHCP server addresses per routing interface and to use different server addresses for client packets arriving on different interfaces on the relay agent server addresses for client packets arriving on different interfaces on the relay agent

Router Discovery Protocol is an extension to ICMP and enables hosts to dynamically discover the IP address of routers on local IP subnets

- Based on RFC 1256 for IPv4
- Routers periodically send router discovery messages to announce their presence to locally-attached hosts
- The router discovery message advertises one or more IP addresses on the router that hosts can use as their default gateway
- Hosts can send a router solicitation message asking any router that receives the message to immediately send a router advertisement
- Router discovery eliminates the need to manually configure a default gateway on each host
- It enables hosts to switch to a different default gateway if one goes down

Loopback interfaces are available as dynamic, stable IP addresses for other devices on the network, and for routing protocols

Support of Routing Information Protocol (RIPv2) as a distance vector protocol specified in RFC 2453 for IPv4

- Each route is characterized by the number of gateways, or hops, a packet must traverse to reach its intended destination
- Categorized as an interior gateway protocol, RIP operates within the scope of an autonomous system

IP Multinetting allows to configure more than one IP address on a network interface (other vendors may call it IP Aliasing or Secondary Addressing)

ICMP Throttling feature adds configuration options for the transmission of various types of ICMP messages

- ICMP Redirects can be used by a malicious sender to perform man-in-the-middle attacks, or divert packets to a malicious monitor, or to cause Denial of Service (DoS) by blackholing the packets
- ICMP Echo Requests and other messages can be used to probe for vulnerable hosts or routers
- Rate limiting ICMP error messages protects the local router and the network from sending a large number of messages that take CPU and bandwidth

The Policy Based Routing feature (PBR) overrides routing decision taken by the router and makes the packet to follow different actions based on a policy

- It provides freedom over packet routing/forwarding instead of leaving the control to standard routing protocols based on L3
- For instance, some organizations would like to dictate paths instead of following the paths shown by routing protocols
- Network Managers/Administrators can set up policies such as:
 - My network will not carry traffic from the Engineering department
 - Traffic originating within my network with the following characteristics will take path A, while other traffic will take path B
 - When load sharing needs to be done for the incoming traffic across multiple paths based on packet entities in the incoming traffic

Enterprise security

Traffic control MAC Filter and Port Security help restrict the traffic allowed into and out of specified ports or interfaces in the system in order to increase overall security and block MAC address flooding issues

DHCP Snooping monitors DHCP traffic between DHCP clients and DHCP servers to filter harmful DHCP message and builds a bindings database of (MAC address, IP address, VLAN ID, port) tuples that are considered authorized in order to prevent DHCP server spoofing attacks

IP source guard and Dynamic ARP Inspection use the DHCP snooping bindings database per port and per VLAN to drop incoming packets that do not match any binding and to enforce source IP/MAC addresses for malicious users traffic elimination

Time-based Layer 2 / Layer 3-v4 / Layer 3-v6 / Layer 4 Access Control Lists (ACLs) can be binded to ports, Layer 2 interfaces, VLANs and LAGs (Link Aggregation Groups or Port channel) for fast unauthorized data prevention and right granularity

For in-band switch management, management ACLs on CPU interface (Control Plane ACLs) are used to define the IP/MAC or protocol through which management access is allowed for increased HTTP/HTTPS or Telnet/SSH management security

Out-of-band management is available via dedicated service port (1G RJ45 OOB) when in-band management can be prohibited via management ACLs

Bridge protocol data unit (BPDU) Guard allows the network administrator to enforce the Spanning Tree (STP) domain borders and keep the active topology consistent and predictable - unauthorized devices or switches behind the edge ports that have BPDU enabled will not be able to influence the overall STP by creating loops

Spanning Tree Root Guard (STRG) enforces the Layer 2 network topology by preventing rogue root bridges potential issues when for instance, unauthorized or unexpected new equipment in the network may accidentally become a root bridge for a given VLAN

Dynamic 802.1x VLAN assignment mode, including Dynamic VLAN creation mode and Guest VLAN / Unauthenticated VLAN are supported for rigorous user and equipment RADIUS policy server enforcement

- Up to 48 clients (802.1x) per port are supported, including the authentication of the users domain, in order to facilitate convergent deployments. For instance when IP phones connect PCs on their bridge, IP phones and PCs can authenticate on the same switch port but under different VLAN assignment policies (Voice VLAN versus other Production VLANs)

802.1x MAC Address Authentication Bypass (MAB) is a supplemental authentication mechanism that lets non-802.1x devices bypass the traditional 802.1x process altogether, letting them authenticate to the network using their client MAC address as an identifier

- A list of authorized MAC addresses of client NICs is maintained on the RADIUS server for MAB purpose
- MAB can be configured on a per-port basis on the switch
- MAB initiates after unsuccessful dot1x authentication process (configurable time out), when clients don't respond to any of EAPOL packets
- When 802.1X unaware clients try to connect, the switch sends the MAC address of each client to the authentication server
- The RADIUS server checks the MAC address of the client NIC against the list of authorized addresses
- The RADIUS server returns the access policy and VLAN assignment to the switch for each client

With Successive Tiering, the Authentication Manager allows for authentication methods per port for a Tiered Authentication based on configured time-outs

- By default, configuration authentication methods are tried in this order: Dot1x, then MAB, then Captive Portal (web authentication)
- With BYOD, such Tiered Authentication is powerful and simple to implement with strict policies
 - For instance, when a client is connecting, M4300 tries to authenticate the user/client using the three methods above, the one after the other
- The admin can restrict the configuration such that no other method is allowed to follow the captive portal method, for instance

Double VLANs (DVLAN) pass traffic from one customer domain to another through the "metro core" in a multi-tenancy environment: customer VLAN IDs are preserved and a service provider VLAN ID is added to the traffic so the traffic can pass the metro core in a simple, secure manner

Private VLANs (with Primary VLAN, Isolated VLAN, Community VLAN, Promiscuous port, Host port, Trunks) provide Layer 2 isolation between ports that share the same broadcast domain, allowing a VLAN broadcast domain to be partitioned into smaller point-to-multipoint subdomains across switches in the same Layer 2 network

- Private VLANs are useful in DMZ when servers are not supposed to communicate with each other but need to communicate with a router
- They remove the need for more complex port-based VLANs with respective IP interface/subnets and associated L3 routing
- Another Private VLANs typical application are carrier-class deployments when users shouldn't see, snoop or attack other users' traffic

SSL version 3 and TLS version 2 ensure Web GUI sessions are secured

Secure Shell (SSH version 2) and SNMPv3 (with or without MD5 or SHA authentication) ensure SNMP and Telnet sessions are secured

2048-bit RSA key pairs, SHA2-256 and SHA2-512 cryptographic hash functions for SSLv3 and SSHv2 are supported on all M4300 models

TACACS+ and RADIUS enhanced administrator management provides strict “Login” and “Enable” authentication enforcement for the switch configuration, based on latest industry standards: exec authorization using TACACS+ or RADIUS; command authorization using TACACS+ and RADIUS Server; user exec accounting for HTTP and HTTPS using TACACS+ or RADIUS; and authentication based on user domain in addition to user ID and password

Superior quality of service

Advanced classifier-based hardware implementation for Layer 2 (MAC), Layer 3 (IP) and Layer 4 (UDP/TCP transport ports) prioritization

8 queues (7 in a stack) for priorities and various QoS policies based on 802.1p (CoS) and DiffServ can be applied to interfaces and VLANs

Advanced rate limiting down to 1 Kbps granularity and minimum-guaranteed bandwidth can be associated with ACLs for best granularity

Single Rate Policing feature enables support for Single Rate Policer as defined by RFC 2697

- Committed Information Rate (average allowable rate for the class)
- Committed Burst Size (maximum amount of contiguous packets for the class)
- Excessive Burst Size (additional burst size for the class with credits refill at a slower rate than committed burst size)
- DiffServ feature applied to class maps

Automatic Voice over IP prioritization with protocol-based (SIP, H323 and SCCP) or OUI-based Auto-VoIP up to 144 simultaneous voice calls

iSCSI Flow Acceleration and automatic protection / QoS with Auto-iSCSI

Flow Control

802.3x Flow Control implementation per IEEE 802.3 Annex 31B specifications with Symmetric flow control, Asymmetric flow control or No flow control

- Asymmetric flow control allows the switch to respond to received PAUSE frames, but the ports cannot generate PAUSE frames
- Symmetric flow control allows the switch to both respond to, and generate MAC control PAUSE frames

Allows traffic from one device to be throttled for a specified period of time: a device that wishes to inhibit transmission of data frames from another device on the LAN transmits a PAUSE frame

- A device that wishes to inhibit transmission of data frames from another device on the LAN transmits a PAUSE frame

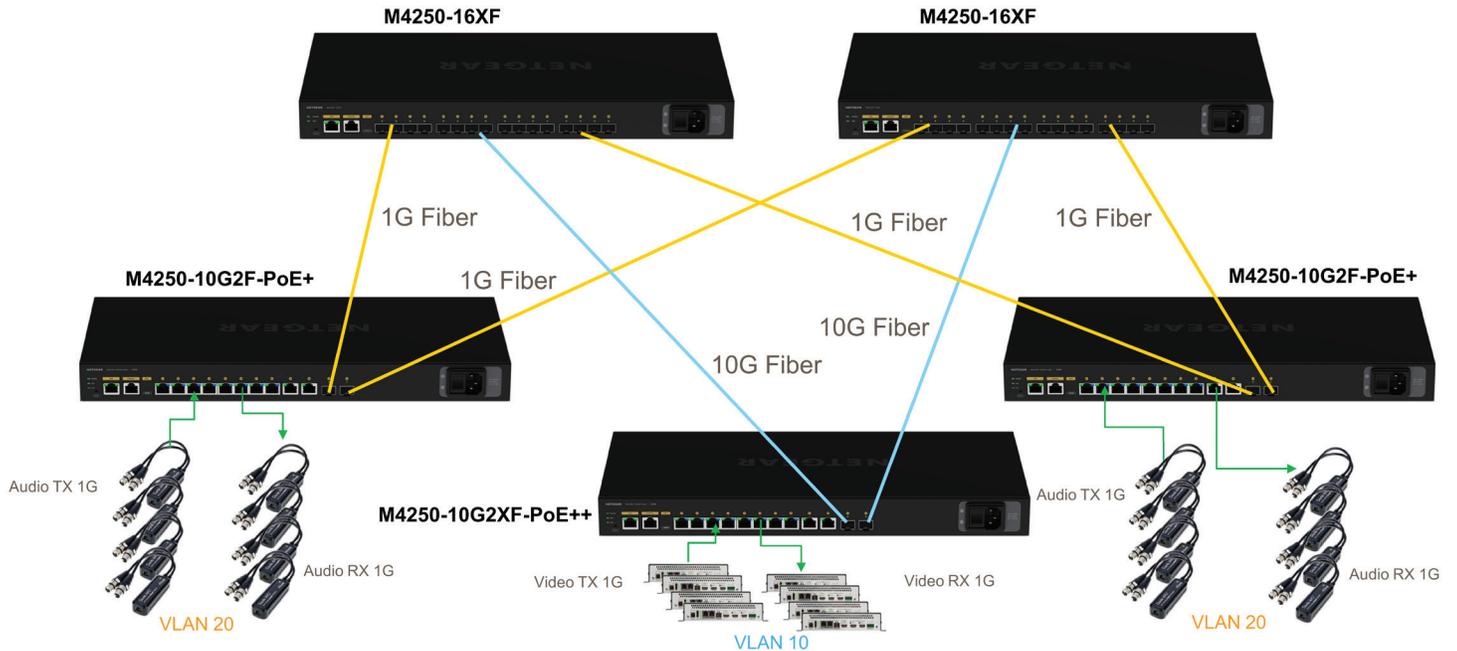
UDLD Support

UDLD implementation detects unidirectional links physical ports (UDLD must be enabled on both sides of the link in order to detect an unidirectional link)

- UDLD protocol operates by exchanging packets containing information about neighboring devices
- The purpose is to detect and avoid unidirectional link forwarding anomalies in a Layer 2 communication channel

Both “normal-mode” and “aggressive-mode” are supported for perfect compatibility with other vendors implementations, including port “D-Disable” triggering cases in both modes

Target Application



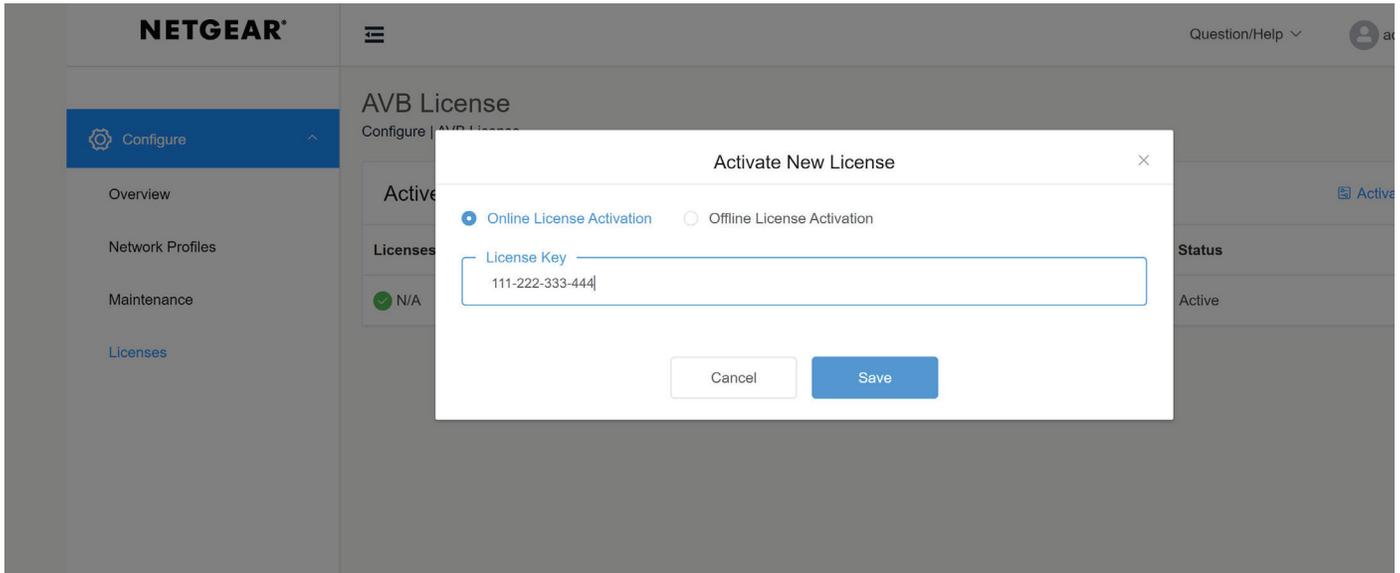
A new AV Line of M4250 switches with out-of-the-box functionality and an industry-first: a concurrent second user interface solely designed with the AV Pro in mind.

NETGEAR has enhanced the experience for AV professionals by including a new user interface designed from the ground up. Pro AV customers don't have to settle for an IT-centric interface with settings and IT-specific functionality they will never need. The new M4250 AV interface presents the common AV controls right up front with user-selectable profiles for common AV platforms making it a snap to ensure the settings are correct for a specific audio or video application.



Components and Modules

M4250 AV Licenses



M4250 AVB Licenses are electronic SKUs. A license registration key is received by email and can be copied and pasted directly in the AV UI [Switch IP Address:8080] when the switch is online.



Components and Modules

M4250-10G2F-PoE+ AV Line Managed Switch

Ordering information

- Americas: GSM4212P-100NAS
- Europe: GSM4212P-100EUS
- Asia Pacific: GSM4212P-100AJS
- China: GSM4212P-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4212P-10000S (sold separately)

- 8-port 10/100/1000BASE-T (RJ45) PoE+ with 125W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 2-port 1000BASE-X (SFP)
- 24 Gbps non-blocking fabric across 12 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 200 x 43.2 mm
- Weight: 2.85Kg (6.28lb)



Components and Modules

M4250-10G2XF-PoE+ AV Line Managed Switch

Ordering information

- Americas: GSM4212PX-100NAS
- Europe: GSM4212PX-100EUS
- Asia Pacific: GSM4212PX-100AJS
- China: GSM4212PX-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4212PX-10000S (sold separately)

- 8-port 10/100/1000BASE-T (RJ45) PoE+ with 240W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 2-port 1000/10GBASE-X (SFP+)
- 60 Gbps non-blocking fabric across 12 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 200 x 43.2 mm
- Weight: 2.9Kg (6.39lb)



Components and Modules

M4250-10G2XF-PoE++ AV Line Managed Switch

Ordering information

- Americas: GSM4212UX-100NAS
- Europe: GSM4212UX-100EUS
- Asia Pacific: GSM4212UX-100AJS
- China: GSM4212UX-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4212UX-10000S (sold separately)

- 8-port 10/100/1000BASE-T (RJ45) Ultra90 PoE++ with 720W PoE budget
- 2-port 10/100/1000BASE-T (RJ45)
- 2-port 1000/10GBASE-X (SFP+)
- Compatible 802.3af (15.4W), 802.3at (30W), 802.3bt (60, 75 and 90W)
- 60 Gbps non-blocking fabric across 12 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 257 x 43.2 mm
- Weight: 3.83Kg (8.44lb)



Components and Modules

M4250-12M2XF

AV Line Managed Switch

Ordering information

- Americas: MSM4214X-100NAS
- Europe: MSM4214X-100EUS
- Asia Pacific: MSM4214X-100AJS
- China: MSM4214X-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4214X-10000S (sold separately)

- 12-port 100/1000/2.5GBASE-T (RJ45)
- 2-port 1000/10GBASE-X (SFP+)
- 100 Gbps non-blocking fabric across 14 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 100 x 43.2 mm
- Weight: 1.74Kg (3.85lb)



Components and Modules

M4250-16XF

AV Line Managed Switch

Ordering information

- Americas: XSM4216F-100NAS
- Europe: XSM4216F-100EUS
- Asia Pacific: XSM4216F-100AJS
- China: XSM4216F-100PRS
- Warranty: Lifetime ProSAFE Hardware Warranty
- AVB License: AVB4216F-10000S (sold separately)

- 16-port 1000/10GBASE-X (SFP+)
- 320 Gbps non-blocking fabric across 16 ports
- Out-of-band 1G Ethernet management port
- USB-C and RJ45 RS232 console ports and USB-A storage port
- Front black display panel and all ports in the back
- Possible reversed mounting with ports in the front
- Rack-mounting standard brackets
- Longer brackets for recessed mounting (2 inches / 5 cm)
- Threaded hole in front (1xM10) for clamps
- Threaded holes on the bottom (4xM5) for 50x100mm VESA plates
- Selectable fan modes for fanless, quiet, or cool operation
- Dimensions (WxDxH): 440 x 100 x 43.2 mm
- Weight: 1.74Kg (3.85lb)



GBIC SFP and SFP+ Optics for M4250 series

| Ordering information • Worldwide: see table below • Warranty: 5 years | Multimode Fiber (MMF) | | Single mode Fiber (SMF) |
|--|---|--|--|
| | OM1 or OM2 62.5/125µm | OM3 or OM4 50/125µm | 9/125µm |
| <p>10 Gigabit SFP+</p>  <p>• Fits into M4250 SFP+ interfaces</p> | <p>AXM763</p> <p>10GBase-LRM long reach multimode 802.3aq - LC duplex connector up to 220m (722 ft)</p> <p>AXM763-10000S (1 unit)</p> | <p>AXM763</p> <p>10GBase-LRM long reach multimode 802.3aq - LC duplex connector up to 260m (853 ft)</p> <p>AXM763-10000S (1 unit)</p> <p>AXM761</p> <p>10GBase-SR short reach multimode LC duplex connector up to 300m (984 ft)</p> <p>AXM761-10000S (1 unit) AXM761P10-10000S (pack of 10 units)</p> | <p>AXM762</p> <p>10GBase-LR long reach single mode LC duplex connector up to 10km (6.2 miles)</p> <p>AXM762-10000S (1 unit) AXM762P10-10000S (pack of 10 units)</p> <p>AXM764</p> <p>10GBase-LR LITE single mode LC duplex connector up to 2km (1.2 mile)</p> <p>AXM764-10000S (1 unit)</p> |
| <p>Gigabit SFP</p>  <p>• Fits into M4250 SFP+ and SFP interfaces</p> | <p>AGM731F</p> <p>1000Base-SX short range multimode LC duplex connector up to 275m (902 ft)</p> <p>AGM731F (1 unit)</p> | <p>AGM731F</p> <p>1000Base-SX short range multimode LC duplex connector OM3: up to 550m (1,804 ft) OM4: up to 1,000m (3,280 ft)</p> <p>AGM731F (1 unit)</p> | <p>AGM732F</p> <p>1000Base-LX long range single mode LC duplex connector up to 10km (6.2 miles)</p> <p>AGM732F (1 unit)</p> |

AGM734
1000BASE-T RJ45 SFP (Gigabit)

Ordering information

- Worldwide: AGM734-10000S
- Warranty: 5 years



- Fits into M4250 SFP+ and SFP interfaces
- 1 port Gigabit RJ45
- Supports only 1000Mbps full-duplex mode
- Up to 100m (328 ft) with Cat5 RJ45 or better
- Conveniently adds 1G copper connectivity to M4250 fiber interfaces
- M4250-16XF (XSM4216F) supports AGM734 on its ports 1 to 12 only

AXM765
10GBASE-T RJ45 SFP+ (10 Gigabit)

Ordering information

- Worldwide: AXM765-10000S
- Warranty: 5 years



- Fits into M4250 SFP+ interfaces
- 1 port 10GBASE-T RJ45
- Copper connectivity up to 30 m (98 feet) distance
- CAT6a or better wiring required for 10GBASE-T up to 30 meters
- Conveniently adds 10G copper connectivity to M4250 fiber interfaces

Direct Attach Cables for M4250 series

| Ordering information | SFP+ to SFP+ | | |
|---|---|--|---|
| | 1 meter (3.3 ft) | 3 meters (9.8 ft) | 5 meters (16.4 ft) |
| <p>10 Gigabit DAC</p>  <ul style="list-style-type: none"> Worldwide: see table below Warranty: 5 years | <p>AXC761</p> <p>10GSFP+ Cu (passive) SFP+ connectors</p> <p>AXC761-10000S (1 unit)</p> | <p>AXC763</p> <p>10GSFP+ Cu (passive) SFP+ connectors</p> <p>AXC763-10000S (1 unit)</p> | <p>AXC765</p> <p>10GSFP+ Cu (active) SFP+ connectors</p> <p>AXC765-10000S (1 unit)</p> |
| | 7 meters (23.0 ft) | 10 meters (32.8 ft) | 15 meters (49.2 ft) |
| | <p>AXC767</p> <p>10GSFP+ Cu (active) SFP+ connectors</p> <p>AXC767-10000S (1 unit)</p> | <p>AXC7610</p> <p>10GSFP+ Cu (active) SFP+ connectors</p> <p>AXC7610-10000S (1 unit)</p> | <p>AXC7615</p> <p>10GSFP+ (duplex fiber optic) SFP+ connectors</p> <p>AXC7615-10000S (1 unit)</p> |
| | 20 meters (65.6 ft) | | |
| | <p>AXC7620</p> <p>10GSFP+ (duplex fiber optic) SFP+ connectors</p> <p>AXC7620-10000S (1 unit)</p> | | |
| | <ul style="list-style-type: none"> Fits into M4250 SFP+ interfaces | | |

Technical Specifications

Requirements based on 13.0 software release



| Model Name | Description | Model number |
|--------------------|--|--------------|
| M4250-10G2F-PoE+ | AV Line 8x1G PoE+ 125W 2x1G and 2xSFP+ Managed Switch | GSM4212P |
| M4250-10G2XF-PoE+ | AV Line 8x1G PoE+ 240W 2x1G and 2xSFP+ Managed Switch | GSM4212PX |
| M4250-10G2XF-PoE++ | AV Line 8x1G Ultra90 PoE++ 720W 2x1G and 2xSFP+ Managed Switch | GSM4212UX |
| M4250-12M2XF | AV Line 12x2.5G and 2xSFP+ Managed Switch | MSM4214X |
| M4250-16XF | AV Line 16x1G/10G SFP+ Managed Switch | XSM4216F |

| Physical Interfaces | | | | | |
|--|---|-------------------------------------|---------------------------------------|---|----------------------------------|
| Gigabit and 10 Gigabit Ethernet Ports | Auto-sensing RJ45 PoE 10/100/1000BASE-T | Auto-sensing RJ45 10/100/1000BASE-T | Auto-sensing RJ45 100/1000/2.5GBASE-T | Auto-sensing SFP 100/1000BASE-X | Auto-sensing SFP+ 1000/10GBASE-X |
| M4250-10G2F-PoE+ | 8 ports PoE+ (125W) | 2 | - | 2 | - |
| M4250-10G2XF-PoE+ | 8 ports PoE+ (240W) | 2 | - | - | 2 |
| M4250-10G2XF-PoE++ | 8 ports Ultra90 PoE++ (720W) | 2 | - | - | 2 |
| M4250-12M2XF | - | - | 12 | - | 2 |
| M4250-16XF | - | - | - | - | 16 |
| Total Usable Port Count | 1G Ports | 2.5G Ports | 10G Ports | | |
| M4250-10G2F-PoE+ | 12 | - | - | | |
| M4250-10G2XF-PoE+ | 10 | - | 2 | | |
| M4250-10G2XF-PoE++ | 10 | - | 2 | | |
| M4250-12M2XF | - | 12 | 2 | | |
| M4250-16XF | - | - | 16 | | |
| Management Ports | Console ports | Service port (Out-of-band Ethernet) | | Storage port | |
| All models | Serial RS232 RJ45 (rear); USB-C (rear) | 1 x RJ45 10/100/1000BASE-T (rear) | | 1 x USB-A (front) | |
| Fixed Power Supplies | | | | | |
| All models | Internal PSU with on/off switch | | | | |
| Fixed fans | | | | | |
| All models | Side-to-side airflow | | | | |
| Power over Ethernet | | | | | |
| PSE Capacity | PoE+ Ports (802.3at) | Ultra90 PoE++ Ports (802.3bt) | | Ultra90 PoE++ 802.3bt is compatible with: 802.3af PoE (15.4W), 802.3at PoE++ (30W), and 802.3bt (60W, 75W and 90W). | |
| M4250-10G2F-PoE+ | 8 | - | | | |
| M4250-10G2XF-PoE+ | 8 | - | | | |
| M4250-10G2XF-PoE++ | - | 8 | | | |
| PoE Budget | PoE Budget @ 110V AC in | | | | |
| M4250-10G2F-PoE+ | 125 Watts | | | | |
| M4250-10G2XF-PoE+ | 240 Watts | | | | |
| M4250-10G2XF-PoE++ | 720 Watts | | | | |
| Features Support | M4250-10G2F-PoE+ | M4250-10G2XF-PoE+ | M4250-10G2XF-PoE++ | | |
| IEEE 802.3af (up to 15.4W per port) | Yes | Yes | Yes | | |
| IEEE 802.3at (up to 30W per port) | Yes | Yes | Yes | | |
| IEEE 802.3bt (up to 90W per port) | No | No | Yes | | |
| IEEE 802.3at Layer 2 (LLDP) method | Yes | Yes | Yes | | |
| IEEE 802.3at 2-event classification | Yes | Yes | Yes | | |
| IEEE 802.3bt Layer 2 (LLDP) method | No | No | Yes | | |
| IEEE 802.3bt auto-classification method | No | No | Yes | | |
| Pre-802.3bt standard method | No | No | Yes | | |
| PoE timer / schedule (week, days, hours) | Yes | Yes | Yes | | |



AV Line

| Processor/Memory | | | | |
|---------------------------------------|--|---|------------------------|------------------|
| Processor (CPU) - all models | Integrated ARM A9 1.25Ghz CPU in switching silicon (32-bit) | | | |
| System memory (RAM) - all models | 2 GB | | | |
| Code storage (flash) - all models | 256 MB | Dual firmware image | | |
| Packet Buffer Memory | | | | |
| All models | 16 Mb | Dynamically shared across only used ports | | |
| Performance Summary | | | | |
| Switching fabric | | | | |
| M4250-10G2F-PoE+ | 24 Gbps | Line-rate (non blocking fabric) | | |
| M4250-10G2XF-PoE+, M4250-10G2XF-PoE++ | 60 Gbps | | | |
| M4250-12M2XF | 100 Gbps | | | |
| M4250-16XF | 320 Gbps | | | |
| Throughput (64-byte frames) | | | | |
| M4250-10G2F-PoE+ | 17.86 Mpps | | | |
| M4250-10G2XF-PoE+, M4250-10G2XF-PoE++ | 44.64 Mpps | | | |
| M4250-12M2XF | 74.40 Mpps | | | |
| M4250-16XF | 238.08 Mpps | | | |
| Latency - 10G Fiber | 64-byte frames | 512-byte frames | 1024-byte frames | 1518-byte frames |
| M4250-10G2F-PoE+ | - | - | - | - |
| M4250-10G2XF-PoE+ | 0.838µs | 0.821µs | 0.820µs | 0.819µs |
| M4250-10G2XF-PoE++ | 0.807µs | 0.791µs | 0.790µs | 0.789µs |
| M4250-12M2XF | 0.807µs | 0.791µs | 0.790µs | 0.789µs |
| M4250-16XF | 0.811µs | 0.834µs | 0.860µs | 0.831µs |
| Latency - 1G Fiber | 64-byte frames | 512-byte frames | 1024-byte frames | 1518-byte frames |
| M4250-10G2F-PoE+ | 2.271µs | 2.257µs | 2.267µs | 2.266µs |
| M4250-10G2XF-PoE+ | 1.169µs | 1.174µs | 1.159µs | 1.154µs |
| M4250-10G2XF-PoE++ | 1.148µs | 1.141µs | 1.137µs | 1.156µs |
| M4250-12M2XF | 1.186µs | 1.178µs | 1.156µs | 1.173µs |
| M4250-16XF | 1.274µs | 1.292µs | 1.291µs | 1.297µs |
| Latency - 1G Copper | 64-byte frames | 512-byte frames | 1024-byte frames | 1518-byte frames |
| M4250-10G2F-PoE+ | 2.133µs | 2.136µs | 2.131µs | 2.142µs |
| M4250-10G2XF-PoE+ | 2.140µs | 2.140µs | 2.137µs | 2.144µs |
| M4250-10G2XF-PoE++ | 1.837µs | 1.829µs | 1.828µs | 1.826µs |
| M4250-12M2XF | 2.843µs | 2.836µs | 2.834µs | 2.836µs |
| M4250-16XF | - | - | - | - |
| Latency - 2.5G Copper | 64-byte frames | 512-byte frames | 1024-byte frames | 1518-byte frames |
| M4250-10G2F-PoE+ | - | - | - | - |
| M4250-10G2XF-PoE+ | - | - | - | - |
| M4250-10G2XF-PoE++ | - | - | - | - |
| M4250-12M2XF | 6.013µs | 6.014µs | 6.012µs | 6.016µs |
| M4250-16XF | - | - | - | - |
| Green Ethernet | | | | |
| Energy Efficient Ethernet (EEE) | Compliant with IEEE 802.3az Energy Efficient Ethernet Task Force | | Deactivated by default | |

| Other Metrics | | | | | |
|--|--|--|--|---|--|
| Forwarding mode | Store-and-forward | | | | |
| Addressing | 48-bit MAC address | | | | |
| Address database size | 16K MAC addresses | | | | |
| Number of VLANs | 4,093 VLANs (802.1Q) simultaneously | | | | |
| Number of multicast groups filtered (IGMP) | 4K total (2,048 IPv4 and 2,048 IPv6) | | | | |
| Number of Link Aggregation Groups (LAGs) | 8 LAGs with up to 8 ports per group | | 802.3ad / 802.1AX-2008 | | |
| Number of hardware queues for QoS | 8 queues | | | | |
| Number of routes | IPv4 | | 894 IPv4 Unicast Routes in Default IPv4 Basic SDM Template | | SDM (System Data Management, or switch database) templates allow for granular system resources distribution depending on IPv4 or IPv6 applications |
| | IPv6 | | 126 IPv6 Unicast Routes in Default IPv4 Basic SDM Template | | |
| Number of static routes | | | | | |
| | IPv4 | | 64 | | |
| | IPv6 | | 64 | | |
| RIP application route scaling | | | | | |
| | IPv4 | | 32 in Default IPv4 Basic SDM Template | | |
| Number of IP interfaces (port or VLAN) | 128 | | | | |
| Jumbo frame support | up to 12KB packet size | | | | |
| Acoustic noise | | | | | |
| @ 25°C ambient (77°F) | | | | | |
| Testing method | Following the ISO-7779 standard. Bystander Mode. Chamber Temp 25°C during testing unless noted otherwise. Full, 100%, Data and PoE loaded. Worst case. | | | | |
| SPL (Sound Pressure Level) | dBA values are SPL (Sound Pressure Level) values, testing following the ISO-7779 standard | | | | |
| Fan management | Three modes are configurable using the AV GUI or the CLI: Fan Off mode, Quiet mode (default), and Cool mode | | | | |
| Fan Off mode | M4250-10G2F-PoE+ | M4250-10G2XF-PoE+ | M4250-10G2XF-PoE++ | M4250-12M2XF | M4250-12M2XF |
| Acoustic noise | 0dBA (fanless) | | 0dBA (fanless) | 0dBA (fanless) | 0dBA (fanless) |
| Maximum conditions | Ambient 25°C, Sensor ≤42°C, PoE Power Load 80W, all ports can be used | Ambient 25°C, Sensor ≤44°C, PoE Power Load 90W, all ports can be used | Ambient 25°C, Sensor ≤67°C, PoE Power Load 45W, all ports can be used | Ambient 25°C, Sensor ≤64°C, 4 ports 2.5G used in block 1-6 and 4 ports 2.5G used in block 7-12, no SFP+ | Ambient 25°C, Sensor ≤78°C, 8 ports SFP+ |
| Case Temperature (top) | 41.8°C | 39.6°C | 44.6°C | 56°C | 41.3°C |
| Quiet mode | M4250-10G2F-PoE+ | M4250-10G2XF-PoE+ | M4250-10G2XF-PoE++ | M4250-12M2XF | M4250-12M2XF |
| Conditions | Ambient 25°C, Sensor ≤36°C, PoE Power Load 0-125W, all ports can be used | Ambient 25°C, Sensor ≤37°C, PoE Power Load 240W, all ports can be used | Ambient 25°C, Sensor ≤49°C, PoE Power Load 0-250W, all ports can be used | Ambient 25°C, Sensor ≤58°C, all ports can be used | Ambient 25°C, Sensor ≤67°C, all ports can be used |
| Fan duty | 25 | 25 | 25 | 25 | 25 |
| Acoustic noise | 27.38dBA | 27.4dBA | 34.57dBA | 28.5dBA | 27.44dBA |
| Case Temperature (top) | 35.9°C | 40.6°C | 42.9°C | 53.5°C | 41.6°C |
| Conditions | - | - | Ambient 25°C, Sensor ≤49°C, PoE Power Load 250-380W, all ports can be used | - | - |
| Fan duty | - | - | 30 | - | - |
| Acoustic noise | - | - | 40dBA | - | - |
| Case Temperature (top) | - | - | 43.3°C | - | - |

| | | | | | |
|--|-------------------------------|---------------------------------|---|--------------------------|--------------------------|
| Conditions | - | - | Ambient 25°C, Sensor ≤49°C, PoE Power Load 380-500W, all ports can be used | - | - |
| Fan duty | - | - | 40 | - | - |
| Acoustic noise | - | - | 44.22dBA | - | - |
| Case Temperature (top) | - | - | 44.9°C | - | - |
| Conditions | - | - | Ambient 25°C, Sensor ≤49°C, PoE Power Load 500-720W, all ports can be used | - | - |
| Fan duty | - | - | 40 | - | - |
| Acoustic noise | - | - | 47.19dBA | - | - |
| Case Temperature (top) | - | - | 52.1°C | - | - |
| Cool mode | M4250-10G2F-PoE+ | M4250-10G2XF-PoE+ | M4250-10G2XF-PoE++ | M4250-12M2XF | M4250-12M2XF |
| Fan duty | 100 | 100 | 100 | 100 | 100 |
| Acoustic noise | 55dBA | 56dBA | 66.23dBA | 55dBA | 57dBA |
| Case Temperature (top) | 27.2°C when ambient 25°C | 30.9°C when ambient 25°C | 41.8°C when ambient 25°C | 33.2°C when ambient 25°C | 30.3°C when ambient 25°C |
| Heat Dissipation (BTU) | Without PoE, all ports | With Max PoE, all ports | Standby without any port connection | | |
| M4250-10G2F-PoE+ | 17.32W - 59.13 BTU/hr | 163.9W - 559.55 BTU/hr | 8.53W - 29.12BTU/hr | | |
| M4250-10G2XF-PoE+ | 25W - 85.35 BTU/hr | 306.4W - 1046.05 BTU/hr | 12.96W - 44.24BTU/hr | | |
| M4250-10G2XF-PoE++ | 26.3W - 89.79 BTU/hr | 837.7W - 2859.91 BTU/hr | 18W - 61.45BTU/hr | | |
| M4250-12M2XF | 37.9W - 129.39 BTU/hr | - | 14.1W - 48.14BTU/hr | | |
| M4250-16XF | 47.84W - 163.33 BTU/hr | - | 19.27W - 65.78BTU/hr | | |
| Mean Time Between Failures (MTBF) | 25 °C ambient (77 °F) | @ 45 °C ambient (113 °F) | @ 50 °C ambient (122 °F) | | |
| M4250-10G2F-PoE+ | 778,769 hours (~88.9 years) | 530,659 hours (~60.6 years) | - | | |
| M4250-10G2XF-PoE+ | 576,889 hours (~65.9 years) | 562,708 hours (~64.2 years) | - | | |
| M4250-10G2XF-PoE++ | 947,871 hours (~108.2 years) | 493,860 hours (~56.4 years) | - | | |
| M4250-12M2XF | 720,892 hours (~82.3 years) | - | 416,021 hours (~47.5 years) | | |
| M4250-16XF | 844,633 hours (~96.4 years) | - | 490,265 hours (~56 years) | | |

L2 Services - VLANs

| | | | |
|---|-----|-------------|---|
| IEEE 802.1Q VLAN Tagging | Yes | 802.1Q-1998 | Up to 4,093 VLANs - 802.1Q Tagging |
| Protocol Based VLANs | Yes | | |
| IP subnet | Yes | | |
| ARP | Yes | | |
| IPX | Yes | | |
| Subnet based VLANs | Yes | | |
| MAC based VLANs | Yes | | |
| Voice VLAN | Yes | | Based on phones OUI bytes (internal database, or user-maintained) or protocols (SIP, H323 and SCCP) |
| Private Edge VLAN | Yes | | |
| Private VLAN | Yes | | |
| IEEE 802.1x | Yes | 802.1x-2004 | |
| Guest VLAN | Yes | | |
| RADIUS based VLAN assignment via .1x | Yes | | IP phones and PCs can authenticate on the same port but under different VLAN assignment policies |
| RADIUS based Filter ID assignment via .1x | Yes | | |
| MAC-based .1x | Yes | | |
| Unauthenticated VLAN | Yes | | |
| Double VLAN Tagging | Yes | | |
| Enabling dvlan-tunnel makes interface | Yes | | |
| Global ethertype (TPID) | Yes | | |
| Interface ethertype (TPID) | Yes | | |
| Customer ID using PVID | Yes | | |
| GARP with GVRP/GMRP | Yes | | Automatic registration for membership in VLANs or in multicast groups |
| Multiple Registration Protocol (MRP) | Yes | | Can replace GARP functionality |
| Multicast VLAN Registration Protocol (MVRP) | Yes | | Can replace GARP functionality |
| MVR (Multicast VLAN registration) | Yes | | |

L2 Services - Availability

| | | | |
|---|-----|--|--|
| IEEE 802.3ad - LAGs | Yes | | Up to 8 LAGs and up to 8 ports per group |
| LACP | Yes | | |
| LACP automatically reverts to and from Static LAG | Yes | | |
| Static LAGs | Yes | | |
| LAG Hashing | Yes | | |
| LAG Member Port Flaps Tracking | Yes | | |
| Storm Control | Yes | | |
| IEEE 802.3x (Full Duplex and flow control) | Yes | | |
| Per port Flow Control | Yes | | Asymmetric and Symmetric Flow Control |
| UDLD Support (Unidirectional Link Detection) | Yes | | |
| Normal-Mode | Yes | | |
| Aggressive-Mode | Yes | | |
| Link Dependency | Yes | | Allow the link status of specified ports to be dependent on the link status of other ports |
| IEEE 802.1D Spanning Tree Protocol | Yes | | |
| IEEE 802.1w Rapid Spanning Tree | Yes | | |
| IEEE 802.1s Multiple Spanning Tree | Yes | | |
| Per VLAN STP (PVSTP) with FastUplink and FastBackbone | Yes | | PVST+ interoperability |
| Per VLAN Rapid STP (PVRSTP) | Yes | | RPVST+ interoperability |

| | | |
|--|-----|--|
| STP Loop Guard | Yes | |
| STP Root Guard | Yes | |
| STP BPDU Guard | Yes | |
| STP BPDU Filtering | Yes | |
| STP BPDU Flooding | Yes | |
| L2 Services - Multicast Filtering | | |
| IGMPv2 Snooping Support | Yes | |
| IGMPv3 Snooping Support | Yes | |
| NETGEAR IGMP Plus™ Enhanced Implementation | Yes | For automatic multicast across M4250 / M4300 / M4500 (Spine and Leaf) at Layer 2, removing the need for L3 PIM routing |
| MLDv1 Snooping Support | Yes | |
| MLDv2 Snooping Support | Yes | |
| Expedited Leave function | Yes | |
| Static L2 Multicast Filtering | Yes | |
| Enable IGMP / MLD Snooping per VLAN | Yes | |
| IGMPv1/v2 Snooping Querier, compatible v3 queries | Yes | |
| MLDv1 Snooping Querier | Yes | |
| MGMD Snooping | | |
| Control Packet Flooding | Yes | |
| Flooding to mRouter Ports | Yes | |
| Remove Flood-All-Unregistered Option | Yes | |
| Multicast VLAN registration (MVR) | Yes | |
| L3 Services - Multicast Routing | | |
| IGMP Proxy | Yes | |
| MLD Proxy | Yes | |
| Any Source Multicast (ASM) | Yes | |
| Source Specific Multicast (SSM) | Yes | |
| Multicast streams routing between subnets, VLANs | Yes | |
| Multicast static routes (IPv4, IPv6) | Yes | |
| Neighbor discovery | Yes | |
| PIM-DM (Multicast Routing - dense mode) | Yes | |
| PIM-DM (IPv6) | Yes | |
| PIM-SM (Multicast Routing - sparse mode) | Yes | |
| PIM-SM (IPv6) | Yes | |
| PIM multi-hop RP support | Yes | |
| PIM Timer Accuracy | Yes | |
| PIM-SM Unhandled Events | Yes | |
| IPMC replication (hardware support) | Yes | |
| L3 Services - DHCP | | |
| DHCP IPv4 / DHCP IPv6 Client | Yes | |
| DHCP IPv4 / DHCP IPv6 Server (Stateless, Stateful) | Yes | |
| DHCP Snooping IPv4 / IPv6 | Yes | |
| BootP Relay IPv4 / IPv6 | Yes | |
| DHCP Relay IPv4 / IPv6 | Yes | |



AV Line

| | | |
|--|-----------------------------|---|
| DHCP Relay Option 82 circuit-id and remote-id for VLANs | Yes | |
| Multiple Helper IPs | Yes | |
| Auto Install (DHCP options 66, 67, 150 and 55, 125) | Yes | |
| L3 Services - Routing | | |
| Static Routing / ECMP Static Routing | IPv4/IPv6 | |
| Multiple next hops to a given destination | Yes | |
| Load sharing, Redundancy | Yes | |
| Default routes | Yes | |
| Static Reject routes | Yes | |
| Port Based Routing | Yes | |
| VLAN Routing | Yes | |
| 802.3ad (LAG) for router ports | Yes | |
| Loopback Interfaces | Yes | |
| RIP | IPv4 | |
| RIPv1/RIPv2 | Yes | |
| IP Multinetting | Yes | |
| ICMP throttling | Yes | |
| Router Discovery Protocol | Yes | |
| DNS Client | IPv4/IPv6 | |
| IP Helper | Yes | |
| Max IP Helper entries | 512 | |
| IP Event Dampening | IPv4/IPv6 | |
| Proxy ARP | IPv4/IPv6 | |
| ICMP | IPv4/IPv6 | |
| ICMP redirect detection in hardware | Yes | |
| Policy Based Routing (PBR) | IPv4/IPv6 | |
| Based on the size of the packet | Yes | |
| Based on the Protocol of the payload (Protocol ID field) | Yes | |
| Based on Source MAC address | Yes | |
| Based on Source or Destination IP address | Yes | |
| Based on VLAN tag | Yes | |
| Based on Priority(802.1P priority) | Yes | |
| Network Monitoring and Discovery Services | | |
| ISDP (Industry Standard Discovery Protocol) | Yes | Can interoperate with devices running CDP |
| 802.1ab LLDP | Yes | |
| 802.1ab LLDP - MED | Yes | |
| SNMP | V1, V2, V3 | |
| RMON 1,2,3,9 | Yes | |
| sFlow | Yes (IPv4 and IPv6 headers) | |
| Security | | |
| Network Storm Protection, DoS | | |
| Broadcast, Unicast, Multicast DoS Protection | Yes | |
| Denial of Service Protection (control plane) | Yes | Switch CPU protection |
| Denial of Service Protection (data plane) | Yes | Switch Traffic protection |

| | | | | | |
|--|--------------|---|---|---|--------|
| DoS Attacks Protection | | SIPDIP SMACDMAC FIRSTFRAG TCPFRAG TCPFLAG TCPPOINT | UDPPORT TCPFLAGSEQ TCPOFFSET TCPSYN TCPSYNFIN TCPFINURGPSH | L4PORT ICMP ICMPV4 ICMPV6 ICMPFRAG PINGFLOOD | SYNACK |
| CPU Rate Limiting | Yes | Applied to IPv4 and IPv6 multicast packets with unknown L3 addresses when IP routing/multicast enabled | | | |
| ICMP throttling | Yes | Restrict ICMP, PING traffic for ICMP-based DoS attacks | | | |
| Management | | | | | |
| Management ACL (MACAL) Max Rules | Yes 64 | Protects management CPU access through the LAN | | | |
| Out of band Management | Yes | In-band management can be shut down entirely when out-of-band management network | | | |
| Radius accounting | Yes | RFC 2565 and RFC 2866 | | | |
| TACACS+ | Yes | | | | |
| Malicious Code Detection | Yes | Software image files and Configuration files with digital signatures | | | |
| Network Traffic | | | | | |
| Access Control Lists (ACLs) | L2 / L3 / L4 | MAC, IPv4, IPv6, TCP, UDP | | | |
| Time-based ACLs | Yes | | | | |
| Protocol-based ACLs | Yes | | | | |
| ACL over VLANs | Yes | | | | |
| Dynamic ACLs | Yes | | | | |
| IEEE 802.1x Radius Port Access Authentication | Yes | Up to 48 clients (802.1x) per port are supported, including the authentication of the users domain | | | |
| 802.1x MAC Address Authentication Bypass (MAB) | Yes | Supplemental authentication mechanism for non-802.1x devices, based on their MAC address only | | | |
| Network Authentication Successive Tiering | Yes | Dot1x-> MAP -> Captive Portal successive authentication methods based on configured time-outs | | | |
| Port Security | Yes | | | | |
| IP Source Guard | Yes | IPv4 / IPv6 | | | |
| DHCP Snooping | Yes | IPv4 / IPv6 | | | |
| Dynamic ARP Inspection | Yes | IPv4 / IPv6 | | | |
| IPv6 RA Guard Stateless Mode | Yes | | | | |
| MAC Filtering | Yes | | | | |
| Port MAC Locking | Yes | | | | |
| Private Edge VLAN | Yes | A protected port doesn't forward any traffic (unicast, multicast, or broadcast) to any other protected port - same switch | | | |
| Private VLANs | Yes | Scales Private Edge VLANs by providing Layer 2 isolation between ports across switches in same Layer 2 network | | | |
| Quality of Service (QoS) - Summary | | | | | |
| Access Lists | Yes | | | | |
| L2 MAC, L3 IP and L4 Port ACLs | Yes | | | | |
| Ingress | Yes | | | | |
| Egress | Yes | | | | |
| Time-based | Yes | | | | |
| 802.3ad (LAG) for ACL assignment | Yes | | | | |
| Binding ACLs to VLANs | Yes | | | | |
| ACL Logging | Yes | | | | |
| Support for IPv6 fields | Yes | | | | |

| | |
|--|---|
| DiffServ QoS | Yes |
| Edge Node applicability | Yes |
| Interior Node applicability | Yes |
| 802.3ad (LAG) for service interface | Yes |
| Support for IPv6 fields | Yes |
| Ingress/Egress | Yes |
| IEEE 802.1p COS | Yes |
| 802.3ad (LAG) for COS configuration | Yes |
| WRED (Weighted Deficit Round Robin) | Yes |
| Strict Priority queue technology | Yes |
| Single Rate Policing | Yes (CLI only) |
| Committed Information Rate | Yes |
| Committed Burst Size | Yes |
| Excessive Burst Size | Yes |
| DiffServ feature applied to class maps | Yes |
| Auto-VoIP | Yes, based on protocols (SIP, H323 and SCCP) or on OUI bytes (default database and user-based OUIs) in the phone source MAC address |
| iSCSI Flow Acceleration | Yes |
| Dot1p Marking | Yes |
| IP DSCP Marking | Yes |
| QoS - ACL Feature Support | |
| ACL Support (general, includes IP ACLs) | Yes |
| MAC ACL Support | Yes |
| IP Rule Match Fields: | |
| Destination IP | Inbound/Outbound |
| Destination IPv6 IP | Inbound/Outbound |
| Destination L4 Port | Inbound/Outbound |
| Every Packet | Inbound/Outbound |
| IP DSCP | Inbound/Outbound |
| IP Precedence | Inbound/Outbound |
| IP TOS | Inbound/Outbound |
| Protocol | Inbound/Outbound |
| Source IP (for Mask support see below) | Inbound/Outbound |
| Source IPv6 IP | Inbound/Outbound |
| L3 IPv6 Flow Label | Inbound |
| Source L4 Port | Inbound/Outbound |
| TCP Flag (ack, est, fin) | Inbound/Outbound |
| Supports Masking | Inbound/Outbound |
| MAC Rule Match Fields | |
| COS | Inbound/Outbound |
| Destination MAC | Inbound/Outbound |
| Destination MAC Mask | Inbound/Outbound |
| Ethertype | Inbound/Outbound |
| Source MAC | Inbound/Outbound |
| Source MAC Mask | Inbound/Outbound |
| VLAN ID | Inbound/Outbound |
| Rules attributes | |
| Assign Queue | Inbound |
| Logging -- deny rules | Inbound/Outbound |
| Mirror (to supported interface types only) | Inbound |
| Redirect (to supported interface types only) | Inbound |
| Rate Limiting -- permit rules | Inbound/Outbound |

| | |
|--|-----|
| Interface | |
| Inbound direction | Yes |
| Outbound direction | Yes |
| Supports LAG interfaces | Yes |
| Supports Control-plane interface | Yes |
| Multiple ACLs per interface, dir | Yes |
| Mixed-type ACLs per interface, dir | Yes |
| Mixed L2/IPv4 ACLs per interface, inbound | Yes |
| Mixed IPv4/IPv6 ACLs per interface, inbound | Yes |
| Mixed IPv4/IPv6 ACLs per interface, outbound | Yes |

QoS - DiffServ Feature Support

| | |
|--|------------------|
| DiffServ Supported | Yes |
| Class Type | |
| All | Yes |
| Class Match Criteria | |
| COS | Inbound/Outbound |
| COS2 (Secondary COS) | Inbound |
| Destination IP (for Mask support see below) | Inbound/Outbound |
| Destination IPv6 IP | Inbound/Outbound |
| Destination L4 Port | Inbound/Outbound |
| Destination MAC (for Mask support see below) | Inbound/Outbound |
| Ethertype | Inbound/Outbound |
| Every Packet | Inbound/Outbound |
| IP DSCP | Inbound/Outbound |
| IP Precedence | Inbound/Outbound |
| IP TOS (for Mask support see below) | Inbound/Outbound |
| Protocol | Inbound/Outbound |
| Reference Class | Inbound/Outbound |
| Source IP (for Mask support see below) | Inbound/Outbound |
| Source IPv6 IP | Inbound/Outbound |
| L3 IPv6 Flow Label | Inbound |
| Source L4 Port | Inbound/Outbound |
| Source MAC (for Mask support see below) | Inbound/Outbound |
| VLAN ID (Source VID) | Inbound/Outbound |
| VLAN ID2 (Secondary VLAN) (Source VID) | Inbound/Outbound |
| Supports Masking | Inbound/Outbound |

| | |
|------------------------|-----|
| Policy | |
| Out Class Unrestricted | Yes |

| | |
|--|-----|
| Policy Attributes -- Inbound | |
| Assign Queue | Yes |
| Drop | Yes |
| Mark COS | Yes |
| Mark COS-AS-COS2 | Yes |
| Mark COS2 (Secondary COS) | Yes |
| Mark IP DSCP | Yes |
| Mark IP Precedence | Yes |
| Mirror (to supported interface types only) | Yes |
| Police Simple | Yes |
| Police Single-Rate | Yes |
| Police Two-Rate | Yes |
| Police Color Aware Mode | Yes |
| Redirect (to supported interface types only) | Yes |



AV Line

| | |
|--|---|
| Policy Attributes -- Outbound | Yes |
| Drop | Yes |
| Mark COS | Yes |
| Mark IP DSCP | Yes |
| Mark IP Precedence | Yes |
| Mirror (to supported interface types only) | Yes |
| Police Simple | Yes |
| Police Single-Rate | Yes |
| Police Two-Rate | Yes |
| Police Color Aware Mode | Yes |
| Redirect (to supported interface types only) | Yes |
| Service Interface | |
| Inbound Slot.Port configurable | Yes |
| Inbound 'All' Ports configurable | Yes |
| Outbound Slot.Port configurable | Yes |
| Outbound 'All' Ports configurable | Yes |
| Supports LAG interfaces | Yes |
| Mixed L2/IPv4 match criteria, inbound | Yes |
| Mixed IPv4/IPv6 match criteria, inbound | Yes |
| Mixed IPv4/IPv6 match criteria, outbound | Yes |
| PHB Support | |
| EF | Yes |
| AF4x | Yes |
| AF3x | Yes |
| AF2x | Yes |
| AF1x | Yes |
| CS | Yes |
| Statistics -- Policy Instance | |
| Offered | packets |
| Discarded | packets |
| QoS - COS Feature Support | |
| COS Support | |
| Supports LAG interfaces | Yes |
| COS Mapping Config | |
| Configurable per-interface | Yes |
| IP DSCP Mapping | Yes |
| COS Queue Config | |
| Queue Parm's configurable per-interface | Yes |
| Drop Parm's configurable per-interface | Yes |
| Interface Traffic Shaping (for whole egress interface) | Yes |
| Minimum Bandwidth | Yes |
| Weighted Deficit Round Robin (WDRR) Support | Yes |
| Maximum Queue Weight | 127 |
| WRED Support | Yes |
| PTP - PTPv2 Feature Support | |
| PTPv2 | |
| IEEE 1588 PTPv2 Section 10 and 11.5 | Yes |
| Implementation | Transparent Clock (TC) End-to-End implementation considering the residence time of PTPv2 packets from ingress to egress |
| Limitations | PTPv1 packets are forwarded but not processed (no PTPv1 support). |
| Method | Residence time of the PTPv2 packet at the egress port level |
| PTPv2 packet fields that are updated | The "Sync & Delay_Req" field of passing/egressing out PTPv2 packets is updated with the residence time in the switch |
| PTPv2 packet fields that are NOT updated | Other fields in PTPv2 packets ("Announce", "Delay_Resp", "Pdelay_Req" and "Pdelay_Resp") are not updated |

TSN - Time Sensitive Networking AVB Feature Support

| AVB | |
|--|--|
| IEEE 802.1BA-2011 Audio Video Bridging (AVB) | Yes, when an AVB license is properly installed in the switch (license sold separately, see Ordering Information at the end of the Tech Spec section) |
| IEEE 802.1AS-2011 gPTP | Yes, with an AVB license |
| IEEE 802.1Qav-2009 FQTS | Yes, with an AVB license |
| IEEE 802.1Qat-2010 MSRP | Yes, with an AVB license |
| IEEE 802.1ak MMRP | Yes, with an AVB license |
| IEEE 802.1ak MVRP | Yes, with an AVB license |
| Max number of AVB streams | 256 streams per switch |
| Limitations | AVB isn't supported on a LAG (link aggregation group, or port channel) |

Functional Summary - IETF RFC Standards and IEEE Network Protocols

Core Management

| | |
|--|--|
| RFC 854 – Telnet | RFC 3414 – User-Based Security Model |
| RFC 855 – Telnet option specifications | RFC 3415 – View-based Access Control Model |
| RFC 1155 – SMI v1 | RFC 3416 – Version 2 of SNMP Protocol Operations |
| RFC 1157 – SNMP | RFC 3417 – Transport Mappings |
| RFC 1212 – Concise MIB definitions | RFC 3418 – Management Information Base (MIB) for the Simple Network Management Protocol (SNMP) |
| RFC 1867 – HTML/2.0 forms with file upload extensions | Configurable Management VLAN |
| RFC 1901 – Community-based SNMP v2 | SSL 3.0 and TLS 1.2 |
| RFC 1908 – Coexistence between SNMP v1 and SNMP v2 | - RFC 2246 – The TLS protocol, version 1.0 |
| RFC 2068 – HTTP/1.1 protocol as updated by draft-ietf-http-v11-spec-rev-03 | - RFC 2346 – AES cipher suites for Transport layer security |
| RFC 2271 – SNMP framework MIB | - RFC 2818 – HTTP over TLS SSH 2.0 |
| RFC 2295 – Transparent content negotiation | SSH 2.0 |
| RFC 2296 – Remote variant selection; RSVP/1.0 state management cookies – draft-ietf-http-state-mgmt-05 | - RFC 4253 – SSH transport layer protocol |
| RFC 2576 – Coexistence between SNMP v1, v2, and v3 | - RFC 4252 – SSH authentication protocol |
| RFC 2578 – SMI v2 | - RFC 4254 – SSH connection protocol |
| RFC 2579 – Textual conventions for SMI v2 | - RFC 4251 – SSH protocol architecture |
| RFC 2580 – Conformance statements for SMI v2 | - RFC 4716 – SECSH public key file format |
| RFC 3410 – Introduction and Applicability Statements for Internet Standard Management Framework | - RFC 4419 – Diffie-Hellman group exchange for the SSH transport layer protocol |
| RFC 3411 – An Architecture for Describing SNMP Management Frameworks | HTML 4.0 specification, December 1997 |
| RFC 3412 – Message Processing & Dispatching | |
| RFC 3413 – SNMP Applications | Java Script™ 1.3 |

Advanced Management

Industry-standard CLI with the following features:

- Scripting capability
- Command completion
- Context-sensitive help
- Optional user password encryption
- Multisession Telnet server
- Auto Image Upgrade

Core Switching

| | |
|--|---|
| IEEE 802.1AB – Link level discovery protocol | IEEE 802.1BA-2011, 802.1AS-2011 gPTP, 802.1Qav-2009 FQTS, 802.1Qat-2010 MSRP, 802.1ak MMRP, MVRP with AVB license |
| IEEE 802.1D – Spanning tree | IEEE 802.3ac – VLAN tagging |
| IEEE 802.1p – Ethernet priority with user provisioning and mapping | IEEE 802.3ad – Link aggregation |
| IEEE 802.1Q – Virtual LANs w/ port-based VLANs | IEEE 802.3ae – 10 GbE |
| IEEE 802.1S – Multiple spanning tree compatibility | IEEE 802.3af – Power over Ethernet |
| IEEE 802.1v – Protocol-based VLANs | IEEE 802.3at – Power over Ethernet Plus |
| IEEE 802.1W – Rapid spanning tree | IEEE 802.3x – Flow control |
| IEEE 802.1AB – LLDP | ANSI/TIA-1057 – LLDP-MED |
| IEEE 802.1X – Port-based authentication | GARP – Generic Attribute Registration Protocol: clause 12, 802.1D-2004 |
| IEEE 802.3 – 10Base-T | GMRP – Dynamic L2 multicast registration: clause 10, 802.1D-2004 |
| IEEE 802.3u – 100Base-T | GVRP – Dynamic VLAN registration: clause 11.2, 802.1Q-2003 |
| IEEE 802.3ab – 1000Base-T | RFC 4541 – IGMP snooping and MLD snooping |
| IEEE 802.3bz-2016 – 2.5GBASE-T | RFC 5171 – UniDirectional Link Detection (UDLD) Protocol |

Additional Layer 2 Functionality

| | |
|---|-----------------------------------|
| Broadcast storm recovery | IGMP and MLD snooping querier |
| Double VLAN/VLAN tagging | Port MAC locking |
| DHCP Snooping | MAC-based VLANs |
| Dynamic ARP inspection | IP source guard |
| Independent VLAN Learning (IVL) support | IP subnet-based VLANs |
| IPv6 classification APIs | Voice VLANs |
| Jumbo Ethernet frames | Protected ports |
| Port mirroring | IGMP snooping |
| Static MAC filtering | Green Ethernet power savings mode |

System Facilities

| | |
|---|---|
| Event and error logging facility | RFC 2030 – Simple Network Time Protocol (SNTP) V4 for IPv4, IPv6, and OSI |
| Runtime and configuration download capability | RFC 2131 – DHCP Client/Server |
| PING utility | RFC 2132 – DHCP options and BOOTP vendor extensions |
| XMODEM | RFC 2865 – RADIUS client |
| RFC 768 – UDP | RFC 2866 – RADIUS accounting |
| RFC 783 – TFTP | RFC 2868 – RADIUS attributes for tunnel protocol support |
| RFC 791 – IP | RFC 2869 – RADIUS extensions |
| RFC 792 – ICMP | RFC 2886bis – RADIUS support for Extensible Authentication Protocol (EAP) |
| RFC 793 – TCP | RFC 5176 – RADIUS Change of Auth |

| | |
|--|--|
| RFC 826 – ARP | RFC 3164 – The BSD syslog protocol with RFC 5424 update |
| RFC 951 – BOOTP | RFC 3580 – 802.1X RADIUS usage guidelines |
| RFC 1321 – Message digest algorithm | Power Source Equipment (PSE) IEEE 802.af Powered Ethernet (DTE Power via MDI) standard |
| RFC 1534 – Interoperability between BOOTP and DHCP | |

Core Routing

| | |
|---|--|
| RFC 826 – Ethernet ARP | RFC 1812 – Requirements for IPv4 routers |
| RFC 894 – Transmission of IP datagrams over Ethernet networks | RFC 2082 – RIP-2 MD5 authentication |
| RFC 896 – Congestion control in IP/TCP networks | RFC 2131 – DHCP relay |
| RFC 1027 – Using ARP to implement transparent subnet gateways (Proxy ARP) | RFC 2385–Protection of BGP Sessions via the TCP MD5 Signature Option |
| RFC 1256 – ICMP router discovery messages | RFC 2453 – RIP v2 |
| RFC 1321 – Message digest algorithm | RFC 3021 – Using 31-Bit Prefixes on Point-to-Point Links |
| RFC 1519 – CIDR | RFC 3046 – DHCP/BOOTP relay |

Quality of Service - DiffServ

| | |
|--|--|
| RFC 2474 – Definition of the differentiated services field (DS Field) in IPv4/IPv6 headers | RFC 2697 – A Single Rate Three Color Marker |
| RFC 2475 – An architecture for differentiated services | RFC 3246 – An expedited forwarding PHB (Per-Hop Behavior) |
| RFC 2597 – Assured forwarding PHB group | RFC 3260 – New terminology and clarifications for DiffServ |

Quality of Service - Access Control Lists (ACLs)

| | |
|--|--|
| <p>Permit/deny actions for inbound or outbound IP traffic classification based on:</p> <ul style="list-style-type: none"> - Type of service (ToS) or differentiated services (DS) DSCP field - Source IP address - Destination IP address - TCP/UDP source port - TCP/UDP destination port - IPv6 flow label - IP protocol number | <p>Permit/deny actions for inbound or outbound Layer 2 traffic classification based on:</p> <ul style="list-style-type: none"> - Source MAC address - Destination MAC address - EtherType - VLAN identifier value or range (outer and/or inner VLAN tag) - 802.1p user priority (outer and/or inner VLAN tag) <p>Optional rule attributes:</p> <ul style="list-style-type: none"> - Assign matching traffic flow to a specific queue - Redirect or mirror (flow-based mirroring) matching traffic flow to a specific port - Generate trap log entries containing rule hit counts |
|--|--|

Quality of Service - Class of Service (CoS)

| | |
|---|-----------|
| <p>Direct user configuration of the following:</p> <ul style="list-style-type: none"> - IP DSCP to traffic class mapping - IP precedence to traffic class mapping - Interface trust mode: 802.1p, IP Precedence, IP DSCP, or untrusted - Interface traffic shaping rate - Minimum and maximum bandwidth per queue - Strict priority versus weighted (WRR/WDRR/WFQ) scheduling per queue - Tail drop versus Weighted Random Early Detection (WRED) queue depth management | Auto VoIP |
|---|-----------|

Core Multicast

| | |
|--|--|
| RFC 1112 – Host extensions for IP multicasting | RFC3973 – PIM-DM |
| RFC 2236 – IGMP v2 | RFC4601 – PIM-SM |
| RFC 2710 – MLDv1 | Draft-ietf-magma-igmp-proxy-06.txt – IGMP/MLD-based multicast forwarding (IGMP/MLD proxying) |

| | |
|---|--|
| RFC 2365 – Administratively scoped boundaries | Draft-ietf-magma-igmpv3-and-routing-05.txt – IGMPv3 and multicast routing protocol interaction |
| RFC 3376 – IGMPv3 | Static RP configuration |
| RFC3810 – MLDv2 | Static RP configuration |
| Core IPv6 Routing | |
| RFC 1981 – Path MTU for IPv6 | RFC 3493 – Basic socket interface for IPv6 |
| RFC 2373 – IPv6 addressing | RFC 3513 – Addressing architecture for IPv6 |
| RFC 2460 – IPv6 protocol specification | RFC 3542 – Advanced sockets API for IPv6 |
| RFC 2461 – Neighbor discovery | RFC 3587 – IPv6 global unicast address format |
| RFC 2462 – Stateless autoconfiguration | RFC 3736 – Stateless DHCPv6 |
| RFC 2464 – IPv6 over Ethernet | RFC 4213 – Basic transition mechanisms for IPv6 |
| RFC 2711 – IPv6 router alert | RFC 4291 – Addressing architecture for IPv6 |
| RFC 3056–Connection of IPv6 Domains via IPv4 Clouds | RFC 4443 – Internet Control Message Protocol (ICMPv6) for the IPv6 Specification |
| RFC 3315 –Dynamic Host Configuration Protocol for IPv6 (DHCPv6) | RFC 6164 – Using 127-Bit IPv6 Prefixes on Inter-Router Links |
| RFC 3484 – Default address selection for IPv6 | RFC 6583 – Operational Neighbor Discovery Problems |
| Supported MIBs | |
| Base Package MIBs | |
| ANSI/TIA-1057 – LLDP-EXT-MED-MIB | RFC 2674 – Q-BRIDGE-MIB |
| DIFFSERV DSCP TC (Draft – no RFC) | RFC 2677 – IANA Address Family Numbers MIB |
| DNS-RESOLVER-MIB (IETF DNS Working Group) | RFC 2819 – RMON MIB |
| DNS-SERVER-MIB (IETF DNS Working Group) | RFC 2925 – DISMAN-PING-MIB and DISMAN-TRACEROUTE-MIB |
| GreenEthernet Private MIB | RFC 3273 – RMON MIB for High Capacity Networks |
| IANA-ADDRESS-FAMILY-NUMBERS-MIB (IANA (3/2002) | RFC 3411 – SNMP Management Frameworks MIB |
| IEEE 802.1AB-2004 – LLDP MIB | RFC 3411 – SNMP-FRAMEWORK-MIB |
| IEEE 802.1AB-2005 – LLDP-EXT-DOT3-MIB | RFC 3412 – SNMP-MPD-MIB |
| POWER ETHERNET MIB (Draft – no RFC) | RFC 3413 – SNMP-NOTIFICATION-MIB |
| RFC 1155 – SMI-MIB | RFC 3413 – SNMP-PROXY-MIB (initial revision published as RFC 2273) |
| RFC 1450 – SNMPV2-MIB | RFC 3413 – SNMP-TARGET-MIB (initial revision published as RFC 2273) |
| RFC 2273 – SNMP Notification MIB, SNMP Target MIB | RFC 3414 – User-based Security Model for SNMPv3 MIB |
| RFC 2392 – IANA RTPROTO-MIB | RFC 3415 – View-based Access Control Model for SNMP MIB |
| RFC 2572 – SNMP Message Processing and Dispatching MIB | RFC 3417 – SNMPV2-TM |
| RFC 2574 – User-based Security Model for SNMPv3 MIB | RFC 3418 – SNMPv2 MIB |
| RFC 2575 – View-based Access Control Model for SNMP MIB | RFC 3434 – RMON MIB Extensions for High Capacity Alarms |
| RFC 2576 – SNMP Community MIB | RFC 3584 – SNMP Community MIB |
| RFC 2578 – SNMPV2-SMI | RFC 3621 – POWER-ETHERNET-MIB |

**Multicast Package MIBs**

| | |
|--|--|
| RFC 2932 – IPv4 Multicast Routing MIB for PIMDMv4 | draft-ietf-magma-mgmd-mib-05.txt –Multicast Group Membership Discovery MIB (both IGMP and MLD) |
| RFC 5060 – PIM-SM and PIM-DM MIB for IPv4 and IPv6 | FASTPATH Enterprise MIBs supporting multicast features |
| RFC 5240 – BSR Protocol MIB | |

NETGEAR-BOXSERVICES-PRIVATE-MIB for SFP/SFP+ MIB Support

| | |
|---------------------------------------|---------------------------------------|
| boxServicesFiberPortsOpticsTable | boxServicesFiberPortOpticsPowerOut |
| BoxServicesFiberPortsOpticsEntry | boxServicesFiberPortOpticsPowerIn |
| boxServicesFiberPortIndex | boxServicesFiberPortOpticsTxFault |
| boxServicesFiberPortOpticsTemperature | boxServicesFiberPortOpticsLos |
| boxServicesFiberPortOpticsVoltage | boxServicesFiberPortOpticsFaultStatus |
| boxServicesFiberPortOpticsCurrent | |

Management

| | | |
|---|----------|---|
| Password management | Yes | |
| Configurable Management VLAN | Yes | |
| Out-of-band Management | Yes | In-band management can be shut down using Management ACLs when separate management network |
| Auto Install (BOOTP and DHCP options 66, 67, 150 and 55, 125) | Yes | Scalable deployment process (firmware, config) |
| Admin access control via Radius and TACACS+ | Yes | Policies, Enable |
| Industry standard CLI (IS-CLI) | Yes | Command Line interface |
| CLI commands logged to a Syslog server | Yes | |
| Web-based graphical user interface (GUI) | Yes | Fully functional GUI (exceptions are noted below:) |
| Features without Web GUI support | | |
| Authorization List | CLI only | |
| Control Plane ACL | CLI only | |
| UDLD | CLI only | |
| Policy Based Routing | CLI only | |
| LLPF | CLI only | |
| QoS Policy for Single Rate | CLI only | |
| DHCPv6 Snooping | CLI only | |
| IPv6 DHCP Relay | CLI only | |
| eMail Alerting | CLI only | |
| MMRP | CLI only | |
| Telnet | Yes | |
| IPv6 management | Yes | |
| Dual Software (firmware) image | Yes | Allows non disruptive firmware upgrade process |
| Editable Configuration file | Yes | Text-based (CLI commands) configuration file |
| Non disruptive Config Management | Yes | With new startup configuration file, the switch gracefully resolves any differences with the running config |
| IS-CLI Scripting | Yes | |
| Port descriptions | Yes | |

| | | |
|--|--|---|
| SNTP client over UDP port 123 | Yes | Provides synchronized network timestamp either in broadcast or unicast mode |
| XMODEM | Yes | |
| SNMP v1/v2 | Yes | |
| SNMP v3 with multiple IP addresses | Yes | |
| RMON 1,2,3,9 | Yes | |
| Max Ether Stats entries | 34 | |
| Max History entries | 102 | |
| Max buckets per History entry | 10 | |
| Max Alarm entries | 102 | |
| Max Event entries | 102 | |
| Max Log entries per Event entry | 10 | |
| Port Mirroring | Yes | |
| Number of monitor sessions | 1 (multiple sessions are configurable) | |
| Tx/Rx | Yes | |
| Many to One Port Mirroring | Yes | |
| LAG supported as source ports | Yes | |
| Max source ports in a session | Total switch port count | |
| Remote Port Mirroring (RSPAN) | Yes | When a particular session is enabled, any traffic entering or leaving the source ports of that session is copied (mirrored) onto a Remote Switched Port Analyzer (RSPAN) VLAN |
| Flow based mirroring | Yes | |
| Cable Test utility | Yes | CLI, Web GUI |
| Outbound Telnet | Yes | |
| SSHv2 | Yes | Secure Shell version 2 (OpenSSH 7.5p1) |
| SSH Session Configuration | Yes | |
| SSL v3 and TLS v1.2 for HTTPS web-based access | Yes | Open SSL 1.0.2o) |
| 2048-bit RSA key pairs | Yes | For SSLv3 and SSHv2 |
| SHA2-256 and SHA2-512 cryptographic hash functions | Yes | For SSLv3 and SSHv2 |
| File transfers (uploads, downloads) | TFTP / HTTP | |
| Secured protocols for file transfers | SCP / SFTP / HTTPS | |
| HTTP Max Sessions | 16 | |
| SSL/HTTPS Max Sessions | 16 | |
| HTTP Download (firmware) | Yes | |
| Email Alerting | Yes (CLI only) | |
| Syslog (RFC 3164) (RFC 5424) | Yes, forwarding messages via UDP using the Syslog protocol to one or more collectors or relays | |
| Persistent log supported | Yes | |
| User Admin Management | | |
| User ID configuration | Yes | |
| Max number of configured users | 6 | |
| Support multiple READWRITE Users | Yes | |
| Max number of IAS users (internal user database) | 100 | |
| Authentication login lists | Yes | |
| Authentication Enable lists | Yes | |

| | |
|---|-------------------------------------|
| Authentication HTTP lists | Yes |
| Authentication HTTPS lists | Yes |
| Authentication Dot1x lists | Yes |
| Accounting Exec lists | Yes |
| Accounting Commands lists | Yes |
| Login History | 50 |
| M4250 series - Platform Constants | |
| Maximum number of remote Telnet connections | 5 |
| Maximum number of remote SSH connections | 5 |
| Number of MAC Addresses | 16K |
| Number of VLANs | 4,093 VLANs (802.1Q) simultaneously |
| VLAN ID Range | 1 - 4093 |
| Number of 802.1p Traffic Classes | 8 classes |
| IEEE 802.1x Number of .1x clients per port | 48 |
| Number of LAGs | 8 LAGs with up to 8 ports per group |
| Maximum multiple spanning tree instances (MSTP) | 16 |
| Maximum per VLAN spanning tree instances (PVST) | 32 |
| MAC based VLANS Number supported | Yes 256 |
| Number of network buffers | 182 |
| Number of log messages buffered | 200 |
| Static filter entries Unicast MAC and source port Multicast MAC and source port Multicast MAC and destination port (only) | 20 20 1024 |
| Subnet based VLANs Number supported | Yes 128 |
| Protocol Based VLANs Max number of groups Max protocols | Yes 128 16 |
| Maximum Multicast MAC Addresses entries | 1K |
| Jumbo Frame Support Max Size Supported | Yes 12k |
| Number of IP Source Guard stations | 379 |
| Number of DHCP snooping bindings | 32K |
| Number of DHCPv6 snooping bindings | 32K |
| Number of DHCP snooping static entries | 1024 |
| LLDP-MED number of remote nodes LLDP Remote Management address buffers LLDP Unknown TLV address buffers LLDP Organisationally Defined Large TLV buffers LLDP Organisationally Defined Small TLV buffers | 32 32 100 16 100 |

| | | |
|--|---------------------------|--|
| Port MAC Locking | Yes | |
| Dynamic addresses per port | 600 | |
| Static addresses per port | 20 | |
| sFlow | | |
| Number of samplers | 16 | |
| Number of pollers | 16 | |
| Number of receivers | 8 | |
| Radius | | |
| Max Authentication servers | 32 | |
| Max Accounting servers | 32 | |
| Number of Routes (v4/v6) | | |
| IPv4 Unicast Routes in Default IPv4 Basic SDM Template | 894 | SDM (System Data Management, or switch database) |
| IPv6 Unicast Routes in Default IPv4 Basic SDM Template | 126 | |
| RIP application route scaling (IPv4 only) | 32 | |
| Number of routing interfaces (including port/vlan) | 128 | |
| Number of static routes (v4/v6) | 64/64 | |
| DHCP Server | | |
| Max number of pools | 256 | |
| Total max leases | 2K | |
| DNS Client | | |
| Concurrent requests | 16 | |
| Name server entries | 8 | |
| Seach list entries | 6 | |
| Static host entries | 64 | |
| Cache entries | 128 | |
| Domain search list entries | 32 | |
| DHCPv6 Server | | |
| Max number of pools | 16 | |
| DNS domain names within a pool | 5 | |
| DNS server addresses within a pool | 8 | |
| Delegated prefix definitions within a pool | 10 | |
| Number of Host Entries (ARP/NDP) | | |
| IPv4 only SDM build | 4K | SDM (System Data Management, or switch database) |
| IPv4/IPv6 SDM build (v4/v6) | 512 | |
| Static v4 ARP Entries | 128 | |
| Number of ECMP Next Hops per Route | 16 | |
| Number of ECMP groups | 128 | |
| Total ECMP nexthops in Hardware | 2048 | |
| Maximum MFDB entries | 1K | |
| IGMPv3 / MLDv2 Snooping Limits | | |
| IGMPv3/MLDv2 HW entries when IP Multicast present | 128/64 | |
| IP Multicast | | |
| IGMP Group Memberships per system | 2K (IPv4) and 2K (IPv6) | |
| Multicast Routes | 512 (IPv4) and 128 (IPv6) | |
| PIM-DM Neighbors | 256 | |
| PIM-SM Neighbors | 256 | |
| PIM-SM Static RP Entries | 5 | |
| PIM-SM Candidate RP Group Range Entries | 20 | |
| PIM-SM SSM Range Entries | 5 | |
| IGMP Sources processed per group per message | 73 | |

ACL Limits

| | |
|--|-----------------------------|
| Maximum Number of ACLs (any type) | 100 |
| Maximum Number Configurable Rules per List | 1,023 |
| Maximum ACL Rules per Interface and Direction | 1,023 ingress / 511 ingress |
| Maximum ACL Rules per Interface and Direction (IPv6) | 893 ingress / 253 egress |
| Maximum ACL Rules (system-wide) | 16K |
| Maximum ACL Logging Rules (system-wide) | 128 |
| Maximum ACL per VLAN (system-wide) | 64 |

COS Device Characteristics

| | |
|-------------------------------------|--|
| Configurable Queues per Port | 8 queues (standalone) 7 queues (stack) |
| Configurable Drop Precedence Levels | 3 |

DiffServ Device Limits

| | |
|---|--|
| Number of Queues | 8 queues (standalone) 7 queues (stack) |
| Requires TLV to contain all policy instances combined | Yes |
| Max Rules per Class | 13 |
| Max Instances per Policy | 28 |
| Max Attributes per Instance | 3 |
| Max Service Interfaces | 116 |
| Max Table Entries | |
| Class Table | 32 |
| Class Rule Table | 192 |
| Policy Table | 64 |
| Policy Instance Table | 768 |
| Policy Attribute Table | 2304 |
| Max Nested Class Chain Rule Count | 26 |

AutoVoIP number of voice calls 16

Voice VLAN number of devices 16

iSCSI Flow Acceleration

| | |
|--------------------------------------|-----|
| Max Monitored TCP Ports/IP Addresses | 16 |
| Max Sessions | 192 |
| Max Connections | 192 |

LEDs

Per port Speed, Link, Activity, PoE - Available both in front and in the rear

Per device Power, Fan - Available both in front and in the rear

Physical Specifications

Dimensions

| | |
|--------------------|--|
| M4250-10G2F-PoE+ | Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 7.87 inches (200 mm) |
| M4250-10G2XF-PoE+ | Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 7.87 inches (200 mm) |
| M4250-10G2XF-PoE++ | Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 10.12 inches (257 mm) |
| M4250-12M2XF | Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 3.94 inches (100 mm) |
| M4250-16XF | Width: 17.32 inches (440 mm); Height: 1U - 1.70 inches (43.2 mm); Depth: 7.87 inches (200 mm) |

Weight

| | |
|--------------------|--------------------|
| M4250-10G2F-PoE+ | 6.28 lb (2.850 kg) |
| M4250-10G2XF-PoE+ | 6.39 lb (2.900 kg) |
| M4250-10G2XF-PoE++ | 8.44 lb (3.830 kg) |
| M4250-12M2XF | 3.85 lb (1.745 kg) |
| M4250-16XF | 6.17 lb (2.800 kg) |

Power Consumption

All ports used, max PoE load, line-rate traffic, maximum

| | |
|--------------------|-------------------------|
| M4250-10G2F-PoE+ | 163.9W - 559.55 BTU/hr |
| M4250-10G2XF-PoE+ | 306.4W - 1046.05 BTU/hr |
| M4250-10G2XF-PoE++ | 837.7W - 2859.91 BTU/hr |
| M4250-12M2XF | - |
| M4250-16XF | - |

All ports used, no PoE, line-rate traffic, maximum

| | |
|--------------------|------------------------|
| M4250-10G2F-PoE+ | 17.32W - 59.13 BTU/hr |
| M4250-10G2XF-PoE+ | 25W - 85.35 BTU/hr |
| M4250-10G2XF-PoE++ | 26.3W - 89.79 BTU/hr |
| M4250-12M2XF | 37.9W - 129.39 BTU/hr |
| M4250-16XF | 47.84W - 163.33 BTU/hr |

Standby, no connection on any port

| | |
|--------------------|----------------------|
| M4250-10G2F-PoE+ | 8.53W - 29.12BTU/hr |
| M4250-10G2XF-PoE+ | 12.96W - 44.24BTU/hr |
| M4250-10G2XF-PoE++ | 18W - 61.45BTU/hr |
| M4250-12M2XF | 14.1W - 48.14BTU/hr |
| M4250-16XF | 19.27W - 65.78BTU/hr |

Environmental Specifications

Operating:

| | |
|---|---|
| Temperature (non-PoE models: M4250-12M2XF, M4250-16XF) | 32° to 122°F (0° to 50°C) |
| Temperature (all other models) | 32° to 113°F (0° to 45°C) |
| Humidity | 90% maximum relative humidity, non-condensing |
| Altitude | 10,000 ft (3,000 m) maximum |

Storage:

| | |
|-------------|---|
| Temperature | - 4° to 158°F (-20° to 70°C) |
| Humidity | 95% maximum relative humidity, non-condensing |
| Altitude | 10,000 ft (3,000 m) maximum |

Electromagnetic Emissions and Immunity

| | |
|----------------|--|
| Certifications | CE: EN 55032:2012+AC:2013/CISPR 32:2012, EN 61000-3-2:2014, Class A, EN 61000-3-3:2013, EN 55024:2010 VCCI : VCCI-CISPR 32:2016, Class A RCM: AS/NZS CISPR 32:2013 Class A CCC: GB4943.1-2011; YD/T993-1998; GB/T9254-2008 (Class A) FCC: 47 CFR FCC Part 15, Class A, ANSI C63.4:2014 ISED: ICES-003:2016 Issue 6, Class A, ANSI C63.4:2014 BSMI: CNS 13438 Class A |
|----------------|--|

Safety

| | |
|----------------|---|
| Certifications | CB report / certificate IEC 60950-1:2005 (ed.2)+A1:2009+A2:2013 UL listed (UL 1950)/cUL IEC 950/EN 60950 CE LVD: EN 60950-1: 2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 RCM (AS/NZS) 60950.1:2015 CCC (China Compulsory Certificate): GB4943.1-2011; YD/T993-1998; GB/T9254-2008 (Class A) BSMI: CNS 14336-1 |
|----------------|---|

Package Content

| | |
|------------|--|
| All models | <ul style="list-style-type: none"> Switch Power cord(s) RJ45 straight-through wiring serial console cable to DB9 USB Type-C to USB-A 2.0 console cable Rubber caps for the SFP/SFP+ sockets Rubber footpads for tabletop installation Installation guide Two regular (short) brackets and screws for two-post rack mount (for front posts) allowing for mounting with ports on the back, or ports on the front of the rack Two longer brackets for two-post rack mount (for front posts) recessing the switch by 2 inches in order to make room for the cabling |
|------------|--|

Optional Modules and Accessories

| | | |
|---------------------|---|------------------|
| AGM731F | 1000BASE-SX SFP LC Transceiver (multimode, 550m OM4/OM3 50/125µm, 275m OM2/OM1 62.5/125µm) | AGM731F |
| AGM732F | 1000BASE-LX SFP LC Transceiver (single mode, 10km 9/125µm) | AGM732F |
| AGM734 | 1000BASE-T SFP RJ45 Transceiver | AGM734-10000S |
| AXC761 | 10G Direct Attach SFP+ to SFP+ 1 Meter Passive DAC Cable | AXC761-10000S |
| AXC763 | 10G Direct Attach SFP+ to SFP+ 3 Meter Passive DAC Cable | AXC763-10000S |
| AXC765 | 10G Direct Attach SFP+ to SFP+ 5 Meter Active DAC Cable | AXC765-10000S |
| AXC767 | 10G Direct Attach SFP+ to SFP+ 7 Meter Active DAC Cable | AXC767-10000S |
| AXC7610 | 10G Direct Attach SFP+ to SFP+ 10 Meter Active DAC Cable | AXC7610-10000S |
| AXC7615 | 10G Direct Attach SFP+ to SFP+ 15 Meter Fiber DAC Cable | AXC7615-10000S |
| AXC7620 | 10G Direct Attach SFP+ to SFP+ 20 Meter Fiber DAC Cable | AXC7620-10000S |
| AXM761 | 10GBASE-SR SFP+ LC Transceiver (multimode, 300m OM4/OM3 50/125µm, 33m OM2/OM1 62.5/125µm) | AXM761-10000S |
| AXM761 (pack of 10) | Pack of 10 AXM761 Transceivers (multimode, 300m OM4/OM3 50/125µm, 33m OM2/OM1 62.5/125µm) | AXM761P10-10000S |
| AXM762 | 10GBASE-LR SFP+ LC Transceiver (single mode, 10km 9/125µm) | AXM762-10000S |
| AXM762 (pack of 10) | Pack of 10 AXM762 Transceivers (single mode, 10km 9/125µm) | AXM762P10-10000S |
| AXM763 | 10GBASE-LRM SFP+ LC Transceiver (multimode, 260m OM4/OM3 50/125µm, 220m OM2/OM1 62.5/125µm) | AXM763-10000S |
| AXM764 | 10GBASE-LR LITE SFP+ LC Transceiver (single mode, 2km 9/125µm) | AXM764-10000S |
| AXM765 | 10GBASE-T SFP+ RJ45 Transceiver (30m) | AXM765-10000S |

ProSAFE Warranty and Support

| | |
|---|----------------------------------|
| ProSAFE Limited Lifetime Hardware Warranty** | Included |
| 90 days of Technical Support via phone and email* | Included, 90 days after purchase |
| Lifetime Technical Support through online chat | Included, lifetime |
| Lifetime Next Business Day hardware replacement | Included, lifetime |

ProSupport Service Packs

| | |
|-------------------------------------|---|
| Installation contracts for: | All models |
| PSB0304-10000S | Remote Installation Setup and Configuration Service Contract (2-hour planned appointment) |
| Supplemental support contracts for: | All models |
| PMB0312-10000S | OnCall 24x7 1-year Category 2 |
| PMB0332-10000S | OnCall 24x7 3-year Category 2 |
| PMB0352-10000S | OnCall 24x7 5-year Category 2 |

Ordering Information

| NETGEAR AV Line M4250-10G2F-PoE+ 8x1G PoE+ 125W 2x1G and 2xSFP Managed Switch (GSM4212P) | | | |
|---|------------------|----------------------|------------------|
| Americas | GSM4212P-100NAS | | |
| Europe | GSM4212P-100EUS | Optional AVB License | AVB4212P-10000S |
| Asia Pacific | GSM4212P-100AJS | | |
| China | GSM4212P-100PRS | | |
| NETGEAR AV Line M4250-10G2XF-PoE+ 8x1G PoE+ 240W 2x1G and 2xSFP+ Managed Switch (GSM4212PX) | | | |
| Americas | GSM4212PX-100NAS | | |
| Europe | GSM4212PX-100EUS | Optional AVB License | AVB4212PX-10000S |
| Asia Pacific | GSM4212PX-100AJS | | |
| China | GSM4212PX-100PRS | | |
| NETGEAR AV Line M4250-10G2XF-PoE++ 8x1G Ultra90 PoE++ 802.3bt 720W 2x1G and 2xSFP+ Managed Switch (GSM4212UX) | | | |
| Americas | GSM4212UX-100NAS | | |
| Europe | GSM4212UX-100EUS | Optional AVB License | AVB4212UX-10000S |
| Asia Pacific | GSM4212UX-100AJS | | |
| China | GSM4212UX-100PRS | | |
| NETGEAR AV Line M4250-12M2XF 12x2.5G and 2xSFP+ Managed Switch (MSM4214X) | | | |
| Americas | MSM4214X-100NAS | | |
| Europe | MSM4214X-100EUS | Optional AVB License | AVB4214X-10000S |
| Asia Pacific | MSM4214X-100AJS | | |
| China | MSM4214X-100PRS | | |
| NETGEAR AV Line M4250-16XF 16x1G/10G Fiber SFP+ Managed Switch (XSM4216F) | | | |
| Americas | XSM4216F-100NAS | | |
| Europe | XSM4216F-100EUS | Optional AVB License | AVB4216F-10000S |
| Asia Pacific | XSM4216F-100AJS | | |
| China | XSM4216F-100PRS | | |

** This product comes with a limited warranty that is valid only if purchased from a NETGEAR authorized reseller, and covers unmodified hardware, fans and internal power supplies - not software or external power supplies, and requires product registration at <https://www.netgear.com/business/registration> within 90 days of purchase; see <https://www.netgear.com/about/warranty> for details. Intended for indoor use only.

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