NETGEAR
BUSINESS

Data Sheet | **MS510TX, MS510TXPP**

Multi-Gigabit Ethernet Smart Switches

Introducing a new Gigabit, Multi-Gigabit and 10-Gigabit Smart Switch Family for future-proof deployments

Businesses need to be ready for future expansion: with incoming new multispeed devices, their wired network needs to expand its reach and scope to support speeds greater than 1 Gigabit. The IEEE 802.3bz standard paved the way for new 2.5 Gigabit and 5 Gigabit speeds in addition to legacy 1 Gigabit and 10 Gigabit per second. New servers, workstations, storage devices, and motherboards are coming with 802.3bz (NBASE-T) Multi-Gigabit Ethernet for 2.5X to 5X faster speeds up to 100 meters (323 feet) on legacy CAT5e / CAT6 cables.

That is why NETGEAR launched its new Multi-Gigabit Smart Switches with 10G Copper/Fiber Uplinks. Each port automatically detects which speed is needed by the connected device and provides the adequate speed. As opposed to regular 10-Gigabit switches that will only provide 1-Gigabit connectivity to any device that require less than 10-Gigabit, the MS510TX and MS510TXPP give the exact speed required, with no downgrade. Also, the new NETGEAR Multi-Gigabit switch ports can connect regular CAT5e Ethernet cables, without the need to upgrade to CAT6 wiring, therefore reducing wiring costs and hassle.

Access, Aggregation or Collapsed Core: You can now have your PCs, printers and routers/firewalls connected at 1G and aggregate Multi-Gigabit Ethernet new devices on the same switch, all line-rate. 10G copper and fiber ports are ready for local servers and storage, or high-speed aggregation to your network core.

Highlights

Plenty of headroom with 1G, 2.5G, 5G and even 10G!

- Two Multi-Gigabit RJ-45 ports that support 5G, 2.5G, and 1G
- Two Multi-Gigabit RJ-45 ports that support 2.5G and 1G
- Four 1G RJ-45 ports
- One dedicated 10G RJ-45 port (which also supports 5G, 2.5G and 1G) for uplink or local server / storage
- One dedicated SFP+ fiber uplink port that supports 10G and 1G for uplink or local server / storage

Key features include:

- MS510TXPP: 180W PoE budget available across 8 Gigabit and Multi-Gigabit PoE+ ports (802.3at)
- Multi-Gigabit, multi-speed ports to connect any type of device to a single switch
- Quiet desktop operation or rack mounting with 21dB (MS510TX) or 28.8dB max (MS510TXPP) at 25°C (77°F) ambient
- Layer 3 static routing with 32 routes (IPv4 and IPv6) for interVLAN local routing
- Non-blocking 78Gbps fabric for 2x5G bps+2x2.5Gbps+4x1Gbps+2x10Gbps full duplex switching and routing

Highlights

- Advanced VLAN support for better network segmentation
- L2/L3/L4 access control lists (ACLs) for granular network access control including 802.1x port authentication
- MS510TXPP: Advanced per port PoE controls for remote power management of PoE connected devices including operation scheduling (e.g. Wireless APs, IP security cameras, LED lighting, secure access door locks, IoT devices…)
- Advanced QoS (Quality of Service) for traffic prioritization including port-based, 802.1p and L2/L3/L4 DSCP-based
- Auto "denial-of-service" (DoS) prevention
- IGMP Snooping and Querier for multicast optimization
- Rate limiting and priority queuing for better bandwidth allocation
- Port mirroring for network monitoring
- Energy Efficient Ethernet (IEEE 802.3az) f or maximum power savings
- Cable test to troubleshoot connection issues
- Easy-to-use Web browser-based management GUI
- SNMP v1, v2c, v3 and RMON remote monitoring

Smart IT, not Big IT

- Easy-to-use Web browser-based management GUI makes setup and management simple
- Standards-based technology ensures interoperability with any standards-based devices in the existing network
- Dual firmware images improve reliability and uptime to your network
- Worry-free with NETGEAR Limited Lifetime* hardware warranty
- Minimal down-time with NETGEAR Limited Lifetime* Next-Business-Day Replacement Warranty
- Get deployment assistance with 90-days Free 24x7 Advanced Technical Phone Support**
- Limited Lifetime* Online Chat Technical Support

Hardware at a Glance

	FRONT							REAR	SIDE
Model Name	Form-Factor	10M/ 100M/1G Copper Ports	100M/ 1G/2.5G Copper Ports	100M/1G/ 2.5G/5G Copper Ports	100M/1G/ 2.5G/5G/ 10G Copper Ports	1G/10G SFP+ Fiber Ports	PoE+ 802.3at Ports (Budget)	Power Supply	Fans
MS510TX	Desktop (Rackmount kit)	4	2	2	1 (dedicated)	1 (dedicated)	-	1 internal PSU, fixed	1 internal fan, fixed
MS510TXPP	Desktop (Rackmount kit)	4 PoE+	2 PoE+	2 PoE+	1 (dedicated)	1 (dedicated)	8 PoE+ (180W)	1 internal PSU, fixed	1 internal fan, fixed

MS510TX: 8-port Multi-Gigabit Smart Switch with 10G Copper / Fiber Uplinks

- 2-port RJ-45 Multi-Gigabit Ethernet IEEE 802.3bz (NBASE-T) 100M/1G/2.5G/5G
- 2-port RJ-45 Multi-Gigabit Ethernet IEEE 802.3bz (NBASE-T) 100M/1G/2.5G
- 4-port RJ-45 Gigabit Ethernet 10M/100M/1G
- 1-port RJ-45 10 Gigabit Ethernet Copper (100M/1G/2.5G/5G/10GBASE-T)
- 1-port SFP+ 10 Gigabit Ethernet Fiber (1G/10GBASE-X SFP+)
- 21dB max at 25°C (77°F) ambient

MS510TXPP: 8-port PoE+ Multi-Gigabit Smart Switch with 10G Copper / Fiber Uplinks

- 2-port RJ-45 Multi-Gigabit Ethernet IEEE 802.3bz (NBASE-T) 100M/1G/2.5G/5G with PoE+
- 2-port RJ-45 Multi-Gigabit Ethernet IEEE 802.3bz (NBASE-T) 100M/1G/2.5G with PoE+
- 4-port RJ-45 Gigabit Ethernet 10M/100M/1G with PoE+
- 1-port RJ-45 10 Gigabit Ethernet Copper (100M/1G/2.5G/5G/10GBASE-T)
- 1-port SFP+ 10 Gigabit Ethernet Fiber (1G/10GBASE-X SFP+)
- 28.8dB max at 25°C (77°F) ambient

Software at a Glance

LAYER 2+ / LAYER 3 LITE FEATURES							
Management	IPv4/IPv6 ACL and QoS	IPv4/IPv6 Multicast Filtering	Auto-VoIP, Auto-Video	IEEE (802.3az) Energy Efficient Ethernet	VLANs	Convergence	IPv4 & IPv6 Static Routing
Web Browser-based GUI (HTTP/HTTPS), PC-Based Smart Control Center Utility (SCC) RMON, SNMP	L2, L3, L4 Ingress	IGMP and MLD Snooping	Yes	Yes	Static, Dynamic, Voice, MAC, Protocol-based, and Private	LLDP-MED, RADIUS, 802.1X	Yes

Performance at a Glance

Model Name	Packet Buffer	CPU	ACL	MAC Address Table RP/NDP Table VLANs	Fabric	Latency (Max Connection Speed)	Static Routes (IPv4 & IPv6)	Multicast IGMP Group
MS510TX	1.5MB	800MHz Dual-Core, 512MB RAM,256MB NAND Flash	164 shared (ingress	16K MAC 512 ARP/NDP 256 VLANs	78Gbps line-rate	10GBASE-T: <2.36 µs 10GBASE- X SFP+: <2.60 µs	IPv4: 32 IPv6: 32	512
MS510TXPP	1.5MB	800MHz Dual-Core, 512MB RAM,256MB NAND Flash	164 shared (ingress	16K MAC 512 ARP/NDP 256 VLANs	78Gbps line-rate	10GBASE-T: <2.34 µs 10GBASE-X SFP+: <2.61 µs	IPv4: 32 IPv6: 32	512

Features and Benefits

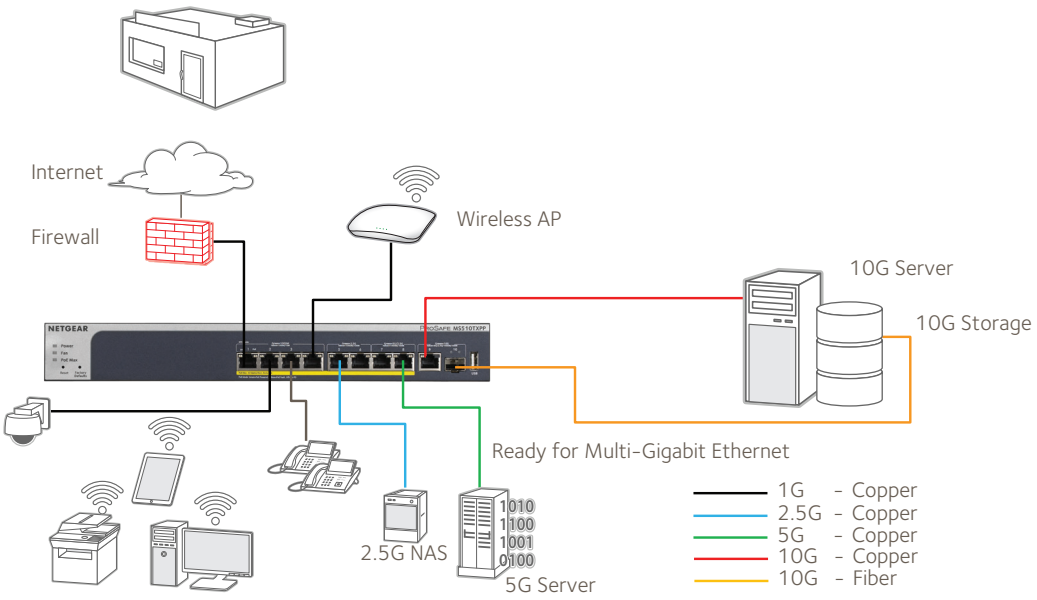
Hardware Features	
• 2-port RJ-45 Multi-Gigabit Ethernet IEEE 802.3bz (NBASE-T) 100M/1G/2.5G/5G • 2-port RJ-45 Multi-Gigabit Ethernet IEEE 802.3bz (NBASE-T) 100M/1G/2.5G • 4-port RJ-45 Gigabit Ethernet 10M/100M/1G • 1-port RJ-45 10-Gigabit Ethernet Copper (100M/1G/2.5G/5G/10GBASE-T) • 1-port SFP+ 10-Gigabit Ethernet Fiber (1G/10GBASE-X SFP+)	Multi-Gigabit, multi-speed ports to connect any type of device to a single switch
USB Configuration Port	Quickly and conveniently upgrade or restore firmware, load or backup configuration files, or download system log files for troubleshooting.
Energy Efficient Ethernet (IEEE 802.3az)	Maximum power reduction for ongoing operation cost savings.
Software Features	
Comprehensive IPv6 Support for Management, ACLs and QoS	Build current network with future in mind. Ensure investment protection and a smooth migration to an IPv6-based network without switch replacement.
IPv4 & IPv6 Static Routing	A simple way to provide segmentation of the network with internal routing through the switch – reserving the router for external traffic routing only, making the entire network more efficient.
Robust security features: • 802.1x authentication (EAP) • Port-based security by locked MAC • ACL filtering to permit or deny traffic based on MAC and IP addresses	Build a secured, converged network with all types of traffic by preventing external attacks and blocking malware while allowing secure access for authorized users.
Comprehensive QoS features: • Port-based or 802.1p-based prioritization • Layer 3-based (DSCP) prioritization • Port-based ingress and egress rate limiting	Advanced controls for optimized network performance and better delivery of mission-critical traffic such as voice and video.
Auto-VoIP, Auto-Voice VLAN, and Auto-Video VLAN	Automatic Voice over IP prioritization (Auto-VoIP) simplifies most complex multi-vendor IP telephone deployments either based on protocols (SIP, H.323 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. Similarly, Auto-Video VLAN enables IGMP snooping to minimize broadcast streams.
IGMP Snooping and MLD Snooping	Facilitate fast receiver joins and leaves for multicast streams. Save cost and improve network efficiency by ensuring multicast traffic only reaches designated receivers without the need of an extra multicast router.
Protected Ports	Ensure no exchange of unicast, broadcast, or multicast traffic between the protected ports on the switch, thereby improving the security of your converged network. This allows your sensitive phone phone conversations to stay private and your surveillance video clips can be forwarded to their designated storage device without leakage or alteration.
DHCP Snooping	Ensure IP address allocation integrity by only allowing DHCP messages from trusted DHCP servers and dropping malformed DHCP messages with a port or MAC address mismatch.
Dynamic VLAN Assignment (RADIUS)	IP phones and PCs can authenticate on the same port but under different VLAN assignment policies. Users are free to move around and enjoy the same level of network access regardless of their physical location on the network.
Private VLAN	Private VLANs help reduce broadcast with added security.
Dual Firmware Images and Configuration Files	Dual firmware images and dual configuration files for transparent firmware updates/configuration changes with minimum service interruption.

Application Sample

Desktop Switch with 10G Uplinks

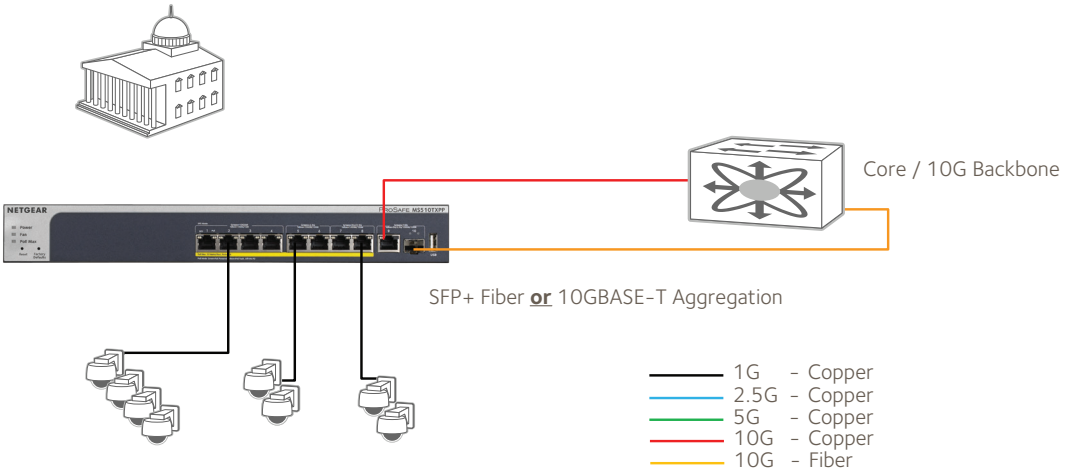
Desktop Switch with 10G Uplinks Application 1

Collapse Core for Advanced Small Businesses



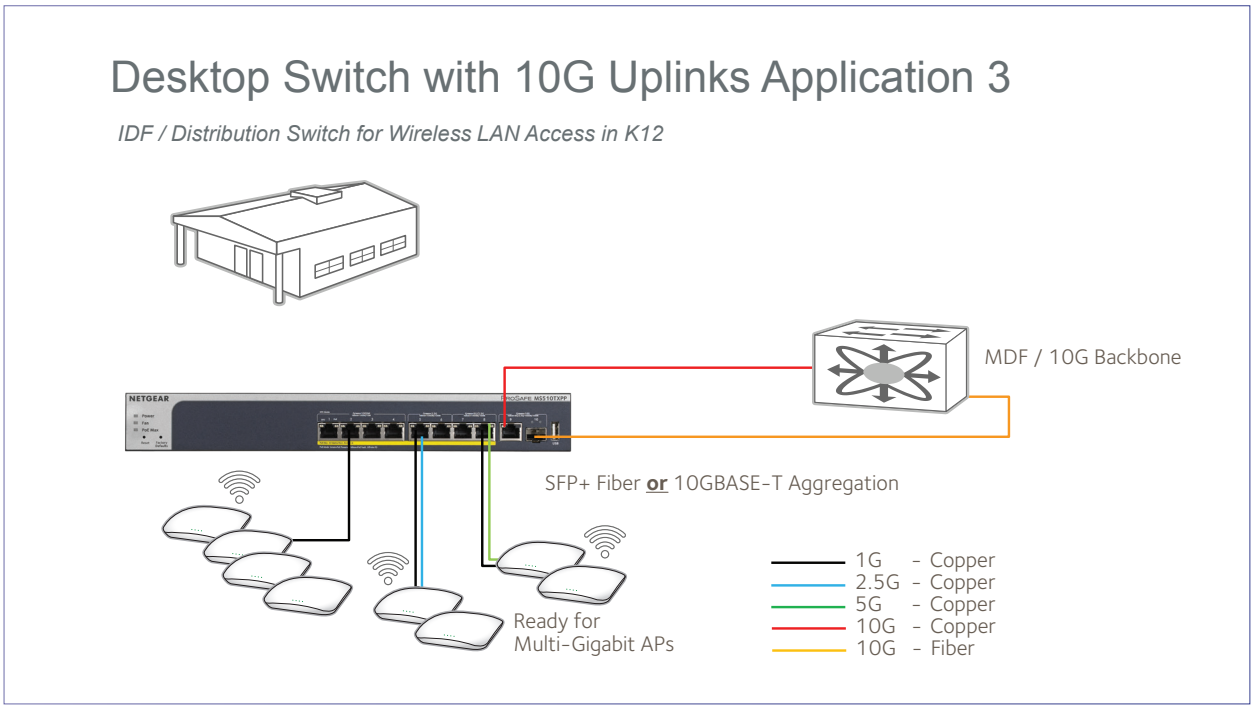
Desktop Switch with 10G Uplinks Application 2

Departmental / Relay IP Surveillance Switch
(Local Government, Hospitalities, Industry)



Application Sample

Desktop Switch with 10G Uplinks



Technical Specifications

Technical Specifications	MS510TX	MS510TXPP
10M/100M/1G RJ-45 copper ports	4	4
100M/1G/2.5G RJ-45 copper ports	2	2
100M/1G/2.5G/5G RJ-45 copper ports	2	2
100M/1G/2.5G/5G/10G RJ-45 copper ports	1 (dedicated)	1 (dedicated)
1G/10G SFP+ (fiber) ports	1 (dedicated)	1 (dedicated)
USB port (for config file upload/backup & firmware updates)	Yes	
Performance Specifications		
Packet buffer memory (Dynamically shared across only used ports)	1.5 MB	
Forwarding modes	Store-and-forward	
Bandwidth	78Gbps	
1G Copper Latency (64 byte packet size)	<2.60 µs	
2.5G Copper Latency (64 byte packet size)	<19.42 µs	
5G Copper Latency (64 byte packet size)	<13.4 µs	
10G Copper Latency (64 byte packet size)	<2.36 µs	
10G Fiber Latency (64 byte packet size)	<2.61 µs	
Priority queues	8	
Priority queuing	Weighted Round Robin (WRR) and Strict Priority	
MAC Address database size (48-bit MAC addresses)	16K	
Multicast groups	512	
Number of IPv4 static routes	32	
Number of IPv6 static routes	32	
Number of VLANs	256	
Number of ARP cache entries	512	
Number of DHCP snooping bindings	1K	
Access Control Lists (ACLs)	164 shared for MAC, IP and IPv6 ACLs	
Packet forwarding rate (64 byte packet size) (Mfps or Mpps)	58	
Jumbo frame support	Up to 10K packet size	
Acoustic noise level @ 25°C (dBA) (ANSI-S10.12)	21 dBA	28.8 dBA
Mean Time Between Failures (MTBF) @ 25°C	1,078,683 hours	376,434 hours
L2 Services - VLANs		
IEEE 802.1Q VLAN tagging	Yes	
IP-based VLANs	Yes	
MAC-based VLANs	Yes	

L2 Services - VLANs	MS510TX	MS510TXPP
Auto-VoIP VLAN / Auto-Voice VLAN	Yes, based on OUI bytes (default database and user-based OUIs) in the phone source MAC address, voice packets must have 802.1Q VLAN tag	
Auto-VoIP	Yes, based on protocols (SIP, H.323 and SCCP). Prioritzes traffic to a higher queue	
Voice VLAN	Yes	
Auto-Video VLAN	Yes	
Private VLAN	Yes	
L2 Services - Availability		
Broadcast, multicast, unknown unicast storm control	Yes	
IEEE 802.3ad - LAGs (LACP)	Yes	
IEEE 802.3x (full duplex and flow control)	Yes	
IEEE 802.1D Spanning Tree Protocol	Yes	
IEEE 802.1w Rapid Spanning Tree Protocol	Yes	
IEEE 802.1s Multiple Spanning Tree Protocol	Yes	
L2 Services - Multicast Filtering		
IGMP snooping (v1, v2 and v3)	Yes	
MLD snooping support (v1 and v2)	Yes	
IGMP snooping querier	Yes	
Block unknown multicast	Yes	
L3 Services - DHCP		
DHCP client	Yes	
DHCP snooping	Yes	
L3 Services - Routing		
IPv4 static routing	32	
IPv6 static routing	32	
VLAN routing	Yes	
Host ARP table (number of entries)	512	
Number of IP VLAN interfaces (routed VLANs)	32	
Link Aggregation		
IEEE 802.3ad - LAGs (LACP)	Yes	
Manual Static LAG	Yes	
# of Static or LACP LAGs # of members in each LAG	8 LAGs with max 8 members in each LAG	
Network Monitoring and Discovery Services		
802.1ab LLDP	Yes	
SNMP	v1/v2c/v3	
RMON group 1,2,3,9	Yes	

Network Security	MS510TX	MS510TXPP
IEEE 802.1x	Yes	
Guest VLAN	Yes	
RADIUS-based VLAN assignment via .1x	Yes	
MAC-based .1x	Yes	
RADIUS accounting	Yes	
Access Control Lists (ACLs)	L2 / L3 / L4 ingress	
IP-based ACLs (IPv4 and IPv6)	Yes	
MAC-based ACLs	Yes	
TCP/UPD-based ACLs	Yes	
MAC lockdown	Yes	
MAC lockdown by the number of MACs	Yes	
Control MAC # Dynamic learned entries (per port)	600	
Control MAC # static entries	600	
IEEE 802.1x RADIUS port access authentication	Yes	
Port-based security by locked MAC addresses	Yes	
Dynamic ARP inspection	Yes	
Broadcast, multicast, unknown unicast storm control	Yes	
DoS attacks prevention	Yes	
Quality of Service		
Port-based rate limiting	Ingress and egress	
Port-based QoS	Yes	
Support for IPv6 fields	Yes	
DiffServ QoS	Yes	
IEEE 802.1p COS	Yes	
Destination MAC and IP	Yes	
IPv4 and v6 DSCP	Yes	
IPv4 and IPv6 ToS	Yes	
TCP/UDP-based	Yes	
Weighted Round Robin (WRR)	Yes	
Strict priority queue technology	Yes	
Auto-VoIP VLAN / Auto-Voice VLAN	Yes, based on OUI bytes (default database and user- based OUIs) in the phone source MAC address, voice packets must have 802.1Q VLAN tag	
Auto-VoIP	Yes, based on protocols (SIP, H.323 and SCCP). Prioritzes traffic to a higher queue	
Voice VLAN	Yes	
Auto-Video VLAN	Yes	

IEEE Network Protocols	MS510TX	MS510TXPP
• IEEE 802.3 Ethernet • IEEE 802.3u 100BASE-T • IEEE 802.3ab 1000BASE-T • IEEE 802.3an 10GBASE-T 10Gbps Ethernet Over Copper Twisted Pair Cable • IEEE 802.3ae 10-Gigabit Ethernet Over Fiber (10GBASE-SR, 10GBASE-LR, 10GBASE-ER, 10GBASE-LX4) - All models • IEEE 802.3z Gigabit Ethernet 1000BASE-SX/LX • IEEE 802.3x Full-Duplex Flow Control	• IEEE 802.1Q VLAN Tagging • IEEE 802.3ad Trunking (LACP) • IEEE 802.1AB LLDP with ANSI/TIA-1057 (LLDP-MED) • IEEE 802.1p Class of Service • IEEE 802.1D Spanning Tree (STP) • IEEE 802.1s Multiple Spanning Tree (MSTP) • IEEE 802.1w Rapid Spanning Tree (RSTP) • IEEE 802.1x RADIUS Network Access Control • IEEE 802.3az Energy Efficient Ethernet (EEE)	
Management		
Password management	Yes	
Configurable management VLAN	Yes	
Admin access control via RADIUS and TACACS+	Yes	
IPv6 management	Yes	
SNTP client over UDP port 123	Yes	
SNMP v1/v2c	Yes	
SNMP v3 with multiple IP addresses	Yes	
RMON group 1,2,3,9	Yes	
Port mirroring	Yes	
Many-to-one port mirroring	8	
Web browser-based graphical user interface (GUI)	Yes	
Smart Control Center (SCC) for multi-switch management	Yes	
Dual software (firmware) image	Yes	
Dual configuration file	Yes	
Cable test utility	Yes	
SSL/HTTPS Web-based access (version)	Yes (v2)	
TLS Web-based access (version)	Yes (v1.0 ~ v1.2)	
File transfers (uploads, downloads)	TFTP / HTTP	
HTTP upload/download (firmware)	Yes	
Syslog (RFC 3164)	Yes	
USB port for firmware and config upload /download	Yes	
LEDs		
Per port	Speed, Link, Activity	Speed, Link, Activity, PoE Mode
Per device	Power and Fan	Power, Fan, Max PoE
Physical Specifications		
Dimensions (W x D x H)	330 x 206 x 43 mm (13.0 x 8.12 x 1.7 in)	330 x 206 x 43 mm (13.0 x 8.12 x 1.7 in)
Weight	2.08 kg (4.25 lb)	2.51 kg (5.53 lb)

Power Consumption	MS510TX	MS510TXPP
Max power (worst case, all ports used, line-rate traffic) (Watts)	26.1 W	234.31 W
Min power (link-down standby) (Watts)	10.19 W	19.39 W
Heat Dissipation (max and min) (BTU/hr)	Max: 89.06 BTU Min: 34.77 BTU	Max: 799.50 BTU/hr Min: 66.16 BTU/hr
Energy Efficient Ethernet (EEE) IEEE 802.3az	Yes (deactivated by default)	
Power back-off	Drops power consumption by 15% to 20% when short copper cables are detected	
Auto power down	Drops power consumption when no connection	
Fan	1	
Environmental Specifications		
Operating		
Operating Temperature	0° to 50°C (32° to 122°F)	
Humidity	95% maximum relative humidity (RH), non-condensing	
Altitude	10,000 ft (3,000 m) maximum	
Storage		
Storage Temperature	-20° to 70°C (- 4° to 158°F)	
Humidity (relative)	95% maximum relative humidity (RH), 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	
Warranty and Support		
Hardware Limited Warranty	Limited Lifetime*	
Lifetime 24x7 Online Technical Support*	Limited Lifetime*	
Lifetime Next-Business-Day (NBD) Replacement	Limited Lifetime*	
ProSUPPORT OnCall 24x7, Category 2** Service Packs	Category 2: PMB0312 (1 yr) PMB0332 (3 yrs) PMB0352 (5 yrs)	

Package Content	
All Models	Multi-Gigabit Ethernet Smart Switch Power cord (localized to country of sale) Rackmount kit Rubber footpads for tabletop installation Installation guide
Ordering Information	
MS510TX-100NAS	North America, Latin America
MS510TX-100EUS	Europe
MS510TX-100AJS	Asia Pacific and Australia
MS510TX-100PRS	China
MS510TX-100INS	India
MS510TXPP-100NAS	North America, Latin America
MS510TXPP-100EUS	Europe
MS510TXPP-100AJS	Asia Pacific and Australia
MS510TXPP-100PRS	China
MS510TXPP-100INS	India
Optional Modules, Software Licenses and Accessories	
AXM761-10000S	SFP+ Transceiver 10GBASE-SR (Short range, multimode)
AXM762-10000S	SFP+ Transceiver 10GBASE-LR (Long range, single mode)
AXM764-10000S	SFP+ Transceiver 10GBASE-LR Lite (Long range lite, single mode)
AXM765-10000S	SFP+ Transceiver 10GBASE-T Copper RJ45 GBIC - up to 30 meters only
AGM731F	SFP Transceiver 1000BASE-SX (Short range, multimode)
AGM732F	SFP Transceiver 1000BASE-LX (Long range, single mode)
AGM734-10000S	SFP Transceiver 1000BASE-T Copper RJ45 GBIC
AXC761-10000S	SFP+ DAC CABLE (1m)
AXC763-10000S	SFP+ DAC CABLE (3m)

*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.

**The NETGEAR OnCall 24x7 contract provides unlimited phone, chat and email technical support for your networking product.

† NETGEAR #1 in US Market Share according to NPD data for Unmanaged and Smart Switches, September 2019. NETGEAR #1 in Europe Market Share according to Context data for Unmanaged and Smart Switches, September 2019.

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