

# MS350 SERIES

Stackable access switches with 10G SFP+ uplinks, designed for high-performance campus networks



## CLOUD MANAGED STACKABLE ACCESS SWITCHES

The Cisco Meraki **MS350** series switches provide reliable and high bandwidth access switching ideal for deploying in campus networks. With high speed stacking capabilities and 10G SFP+ uplinks built in on every model, redundancy and performance are guaranteed. This family also supports options for multigigabit, UPoE, redundant, field-replaceable power supplies for mission critical networks.

Cisco Meraki switches are built from the ground up to be easy to manage without compromising any of the power and flexibility traditionally found in enterprise-class switches.

The Meraki MS is managed through an elegant, intuitive cloud interface, rather than a cryptic command line. To bring up a Meraki switch, just plug it in; there's no need for complicated configuration files, or even direct physical access to the switch.

Meraki's centralized management gives administrators deep visibility into the network and how it's used. See which switches are near capacity across hundreds of sites. Find all configuration changes made by a certain person with instant search.

## INDUSTRY LEADING CLOUD MANAGEMENT

Cloud management has a number of benefits that make it easier to build networks large and small:

- True zero-touch switch provisioning
- Virtual stacking: manage up to thousands of ports from a single pane of glass.
- Application layer visibility with automatic operating system, client, and hostname fingerprinting.
- Powerful Live Tools such as packet capture and cable test to isolate and troubleshoot network issues.
- Alerts upon power loss, downtime, or configuration changes.
- Role-based administration and automatic, scheduled firmware upgrades over the web.
- Regular feature updates and enhancements delivered on demand from the Meraki cloud.

### Product Highlights

- Gigabit and Multigigabit access switching with 24 and 48 port models and optional PoE+, UPoE
- 4 x 10G SFP+ uplink interfaces on all models
- High bandwidth dual stacking interfaces with up to 160G bandwidth
- Support for field replaceable, redundant power supplies
- Non-blocking switch backplane with up to 272 Gbps of switching capacity
- Up to 740 watt PoE budget with PoE+ and UPoE support, dynamic power allocation for powering APs, phones, cameras, and other PoE-enabled devices
- Multigigabit and UPoE (60w) options available for 802.11ac Wave 2 access points and other high bandwidth applications
- 8 dedicated QoS queues for converged voice, video, and data applications
- Low power consumption, quiet acoustic design, and shallow rack depth options, enabling flexible deployment in wiring closets as well as offices and classrooms
- Integrated mounting brackets for rack and desk mounting
- Lifetime hardware warranty and advanced replacement at no additional cost

# Features and Capabilities

Meraki switches include all of the traditional Ethernet features found in modern enterprise access switches, including:

## Powerful Campus Access Switching

- High-bandwidth physical stacking with support for up to 8 stack members for built-in redundancy and performance
- Link Aggregation Control Protocol (LACP) for high-capacity trunking, with Multichassis (MLAG) support on stacked switches
- Static and dynamic routing support with DHCP relay and server capabilities
- Quality-of-Service (QoS) to prioritize mission critical traffic such as voice and video
- Voice VLAN support for simplified VoIP deployments
- CDP, LLDP advertisement and snooping, with detailed neighbor visibility and discovery
- Port Mirroring to monitor network traffic
- IGMP Snooping to optimize network performance for multicast applications

## Network Security

- IEEE 802.1X, MAB, and Hybrid authentication support for wired access control with RADIUS server monitoring
- Port security and MAC whitelisting
- Change of Authorization (CoA) and RADIUS accounting support
- DHCP snooping to prevent users from adding unauthorized DHCP servers on the network
- Rapid spanning tree, BPDU guard, root guard, and other safeguards to help prevent misconfigurations and reduce convergence time
- Per port VLAN configuration and pruning support
- Multiple administrative roles with sophisticated security policy management and multi-tenancy

## Network Troubleshooting & Automation

- Virtual Stacking lets administrators manage up to thousands of ports in a single interface without having to physically connect stack members
- Configuration templates for rapid, zero-touch provisioning and auditing of all sites
- Network Topology for automatic and interactive network mapping
- Remote cable testing, packet capture and client discovery
- Automatic and scheduled firmware upgrades for the complete network

## Converged Voice, Video and Data Environments

The Meraki switch family is designed to unify data, voice, and video onto a single IP backbone. All Meraki switches support rich quality-of-service (QoS) functionality for prioritizing data, voice, and video traffic. The switches support eight class-of-service (CoS) queues on every port, enabling them to maintain end-to-end traffic prioritization.

PoE models provide power VoIP telephones, IP security cameras, wireless access points (APs), and other IP devices. In addition, using CDP and LLDP, PoE power is intelligently budgeted to maximize the number of PoE clients supported. For the most power-hungry applications, support for Cisco UPoE is also available. The Meraki MC products work flawlessly with Meraki switches, and create a unique and powerful experience to installing, supporting and troubleshooting VoIP technology

## Application Layer Visibility

Meraki is the only switch to include integrated Layer 7 fingerprinting. Identify hundreds of applications from business apps to BitTorrent and YouTube. User fingerprinting with Google-like search allows administrators to easily identify and control individual users, PCs, iPads, Androids, and other devices. This unprecedented visibility allows optimizing of network resources and maintaining optimal network performance.

## Beyond the Network Software Architecture

Meraki switches run the same Meraki operating system used by all of Meraki's products. The use of a common operating system allows Meraki to deliver a consistent experience across all product lines, from our Security products to our VoIP phones. When connected, MS350 switches automatically connect to the Meraki cloud, download configuration, and join the appropriate network. If new firmware is required, this is retrieved by the switch and updated automatically. This ensures the network is kept up-to-date with bug fixes, security updates, and new features.

Select a tool:

**Warning:** This test will disrupt traffic to 100 or 10 Mbit devices.

12

Testing the cable attached to port 12

Port	Link	Length	Status	Pair 1	Pair 2	Pair 3	Pair 4
12	down	94.5 m	Failure	open	ok	ok	open

Remote cable test in the Meraki Dashboard

# Powerful Yet Simplified Management and Operations

Meraki's cloud managed architecture makes it simpler than ever to quickly provision and reconfigure switch ports with security, QoS, and other parameters. The Meraki dashboard provides unified policies, event logs, and monitoring, which make it easy to manage and grow large network deployments.

By providing a complete, powerful set of management functions over the web, Meraki's cloud-based management eliminates the need for proprietary command line configuration interfaces which require expensive and time consuming certifications. Meraki MS switches can be fully deployed and provisioned in minutes, without requiring any local configuration or staging. Additional or replacement switches can be sent to remote offices and installed by non-technical staff, saving thousands of dollars in time and travel expenses.

The Meraki MS family also includes several remote diagnostic features, from network connectivity and cable integrity tests to latency measurement tools. For deep client troubleshooting, administrators can even perform per-port remote pcap packet captures without any additional probes or hardware on site.

Upgrade will occur on 11/06/2016 3:00 AM

times. Read more...

Devices to be upgraded

Device status	Name	Firmware status
●	AccessSwitch1	Upgrade available
●	AccessSwitch2	Upgrade available
●	AccessSwitch3	Upgrade available
●	CORE1	Upgrade available

### Scheduled & Automatic Firmware Updates

Slot 1

Slot 2

Slot 3

Operating normally

● Slot 1: POWERING
● Slot 2: FAILURE

Redundant power supply monitoring & alerts

# Designed for Reliability & Environmental Efficiency

The Meraki switch family was designed for reliable, long-lived operation in wiring closet environments, which may be prone to high temperatures and limited ventilation. By minimizing total component count and only using proven switching silicon, Meraki is able to deliver highly reliable products with exceptional mean time between failure (MTBF) ratings.

Each Meraki switch also operates with a split-plane architecture, where silicon-based switching and data forwarding are separated

from software-based control and management. By decoupling the underlying switching logic from control, each unit is able to deliver wire-speed switching even when advanced software features such as Layer 7 host and OS fingerprinting are enabled.

Finally, the highly integrated designs of Meraki switches result in power and cooling savings in large deployment environments of 30-60% when compared with similar managed Gigabit switches.

### CAMPUS EDGE

MS switches are ideal for small and large scale campus deployments, where reliability, scalability, and managability are top priorities.

- Physical stacking technology
- 10GbE SFP+ ports with link aggregation provide high speed fiber connectivity to aggregation switches with the MS425
- Get alerts if any switch fails or goes offline, before it impacts users

Access
6 switch stacks

Delete stacks
Add a stack

Stack Name	Stack Members
● 1.1 Access	<a href="#">Closet 1.1.3</a> <a href="#">Closet 1.1.2</a> <a href="#">Closet 1.1.1</a>
● 5.3 Access	<a href="#">Closet 5.3.4</a> <a href="#">Closet 5.3.5</a>
● 4.1 Access Orange	<a href="#">Closet 4.1.16</a> <a href="#">Closet 4.1.15</a> <a href="#">Closet 4.1.14</a>
● 3.1 Access Blue	<a href="#">Closet 3.1.11</a> <a href="#">Closet 3.1.9</a> <a href="#">Closet 3.1.10</a> <a href="#">Closet 3.1.12</a>
● 3.2 Access	<a href="#">Closet 3.2.1</a> <a href="#">Closet 3.2.2</a> <a href="#">Closet 3.2.3</a>

Managing and monitoring MS350 stacks in the Dashboard

## Dimensions & Interfaces

Model	Physical Dimensions (H x W x D) <sup>1</sup>	Weight <sup>2</sup>	Interface	Switching Capacity	Stacking Bandwidth
MS350-24	1.74" x 19.08" x 20.4" (4.44cm x 48.46cm x 51.81cm)	12.37 lb (5.61 kg)	<ul style="list-style-type: none"> <li>• 24 x 10/100/1000BASE-T Ethernet RJ45 with auto negotiation and auto-MDIX<sup>3</sup></li> <li>• 4 x SFP+ 10GbE uplink</li> <li>• 2 x stacking ports</li> </ul>	128 Gbps	160G (dual interface)
MS350-24P	1.74" x 19.08" x 20.4" (4.44cm x 48.46cm x 51.81cm)	13.14 lb (5.96 kg)	<ul style="list-style-type: none"> <li>• 24 x 10/100/1000BASE-T Ethernet RJ45 with with auto negotiation and auto-MDIX<sup>3</sup></li> <li>• 4 x SFP+ 10GbE uplink</li> <li>• 2 x stacking ports</li> </ul>	128 Gbps	160G (dual interface)
MS350-24X	1.74" x 19.08" x 23.4" (4.44cm x 48.46cm x 59.47cm)	14.48 lb (6.6 kg)	<ul style="list-style-type: none"> <li>• 16 x 10/100/1000BASE-T Ethernet RJ45 with auto negotiation and auto-MDIX</li> <li>• 8 x 1000/2.5G/5G/10G NBASE-T Ethernet RJ45 with auto negotiation and auto-MDIX<sup>3</sup></li> <li>• 4 x SFP+ 10GbE uplink</li> <li>• 2 x stacking ports</li> </ul>	272 Gbps	160G (dual interface)
MS350-48	1.74" x 19.08" x 20.4" (4.44cm x 48.46cm x 51.81cm)	12.85 lb (5.83 kg)	<ul style="list-style-type: none"> <li>• 48 x 10/100/1000BASE-T Ethernet RJ45 with auto negotiation and auto-MDIX*</li> <li>• 4 x SFP+ 10GbE uplink</li> <li>• 2 x stacking ports</li> </ul>	176 Gbps	160G (dual interface)
MS350-48LP	1.74" x 19.08" x 20.4" (4.44cm x 48.46cm x 51.81cm)	13.82 lb (6.27 kg)	<ul style="list-style-type: none"> <li>• 48 x 10/100/1000BASE-T Ethernet RJ45 with with auto negotiation and auto-MDIX<sup>3</sup></li> <li>• 4 x SFP+ 10GbE uplink</li> <li>• 2 x stacking ports</li> </ul>	176 Gbps	160G (dual interface)
MS350-48FP	1.74" x 19.08" x 22" (4.44cm x 48.46cm x 55.87cm)	14.26 lb (6.47 kg)	<ul style="list-style-type: none"> <li>• 48 x 10/100/1000BASE-T Ethernet RJ45 with auto negotiation and auto-MDIX<sup>3</sup></li> <li>• 4 x SFP+ 10GbE uplink</li> <li>• 2 x stacking ports</li> </ul>	176 Gbps	160G (dual interface)

<sup>1</sup>Depth includes accessories and FRUs (field-replaceable units) that ship with the product

<sup>2</sup>Weight includes base chassis only

<sup>3</sup>Note: Interfaces do not support 10M half-duplex

## Power Options & Specifications

Model	Idle / Full Load Power	Available PoE+ Power	Power Supply Configuration	Supported Power Supply (Included)
MS350-24	56 / 66 W	–	Hot-swappable	1 x 250W PSU*
MS350-24P	57 / 466 W	370 W	Hot-swappable	1 x 640W PSU*
MS350-24X	215 / 867 W	740 W	Hot-swappable	1 x 1025W PSU*
MS350-48	56 / 63 W	–	Hot-swappable	1 x 250W PSU*
MS350-48LP	63 / 478 W	370 W	Hot-swappable	1 x 640W PSU*
MS350-48FP	69 / 888 W	740 W	Hot-swappable	1 x 1025W PSU*

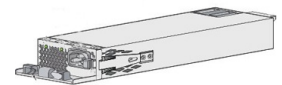
\* Single power supply (PSU) included. For redundancy, second PSU is sold separately

## What's Included

MS250-24	1 x Power Supply (MA-PWR-250WAC), Mounting screw kit
MS250-24P	1 x Power Supply (MA-PWR-640WAC), Mounting screw kit
MS250-48	1 x Power Supply (MA-PWR-250WAC), Mounting screw kit
MS250-48LP	1 x Power Supply (MA-PWR-640WAC), Mounting screw kit
MS250-48FP	1 x Power Supply (MA-PWR-1025WAC), Mounting screw kit



Rack Mounting Kit



Power Supply (PSU)

## Optional Accessories

MS350 switches support 40G stacking cables in various lengths as well as replaceable power supplies (PSU) and fans:

Description	Accessory	Supported Models
250W Power Supply	MA-PWR-250WAC	MS350-24, MS350-48
640W Power Supply	MA-PWR-640WAC	MS350-24P, MS350-48LP
1025W Power Supply	MA-PWR-1025WAC	MS350-24X, MS350-48FP
Meraki Stacking Cable, 0.5 Meter	MA-CBL-40G-50CM	All Models
Meraki Stacking Cable, 1 Meter	MA-CBL-40G-1M	All Models
Meraki Stacking Cable, 3 Meter	MA-CBL-40G-3M	All Models
16K System Fan	MA-FAN-16K	MS350-24, MS350-24P, MS350-48, MS350-48LP, MS350-48FP
18K System Fan	MA-FAN-18K	MS350-24X

The Meraki MS family also supports SFP/SFP+ pluggable optics for high-speed connectivity. Meraki offers a variety of Gigabit and 10 Gigabit accessories. Full specifications and compatibility information is available in the Meraki Accessories datasheet: [https://meraki.cisco.com/lib/pdf/meraki\\_datasheet\\_sfp.pdf](https://meraki.cisco.com/lib/pdf/meraki_datasheet_sfp.pdf)

# Specifications

## Management

Managed via the Web with the Meraki cloud management platform
Integrated with Meraki Wireless and complete portfolio of IT products and solutions
Zero-touch remote provisioning (no staging needed)
Detailed historical per-port and per-client usage statistics
DHCP, client, and hostname fingerprinting
SNMPd and SYSLOG support for integration with other network management solutions
Automatic firmware upgrades with scheduling control

## Remote Diagnostics

Email, SMS and Mobile push notification alerts <sup>1</sup>
Cable testing and link failure detection with alerting
Live remote packet capture
Dynamic and interactive network discovery and topology
Combined event and configuration change logs with instant search

## Flexible Stacking

Physical stacking of up to 8 switches with 160 Gbps stack bandwidth on all models
Virtual stacking supports thousands of switch ports in a single logical stack for unified management, monitoring, and configuration

## Ethernet Switching Capabilities

802.1p Quality of Service, 8 queues and configurable DSCP to CoS mapping
802.1Q VLAN and trunking support for up to 4,095 VLANs
802.1w, 802.1D Rapid Spanning Tree Protocol (RSTP, STP)
Broadcast storm control
802.1ab Link Layer Discovery Protocol (LLDP) and Cisco Discovery Protocol (CDP)
802.3ad Link aggregation with up to 8 ports per aggregate, Multichassis aggregates supported on stacked switches
Port mirroring
IGMP snooping for multicast filtering
MAC forwarding entries: 96K, 512K on MS350-24X

## Security

Integrated two-factor authentication for Dashboard management
Role-based access control (RBAC) with granular device and configuration control
Corporate wide password policy enforcement
IEEE 802.1X RADIUS, hybrid authentication and RADIUS server testing
MAC-based RADIUS authentication (MAB)
Port security: Sticky MAC, MAC whitelisting
DHCP snooping, detection and blocking
STP Enhancements: BPDU guard, Root guard
IPv4 ACLs

<sup>1</sup> Requires carrier-supported email to SMS gateway and/or Meraki Mobile app

<sup>2</sup> OSPF and Warm Spare do not operate concurrently

## Performance

<b>Switching capacity</b> 128 Gbps on 24-port models, 176 Gbps on 48-port models 272 Gbps on 24X
<b>Forwarding rate</b> 95.24 mpps on 24-port models, 127.98 mpps on 48-port models, 202.38 mpps on 24X
Jumbo frame support (9600 byte Ethernet frame)
Flow control support

## Layer 3

Static routing, OSPFv2
Multicast routing
Warm Spare (VRRP) <sup>2</sup>
DHCP Relay, DHCP Server

## Power

Power input: 100 - 240 VAC, 47-63 Hz
Power consumption: 56 - 1655W

## Mounting

1U rack-mountable with included rack mount hardware
2-post front mounting options available

## Environment

Operating temperature: 32 °F to 104 °F (0 °C to 40 °C), 45 °C
Humidity: 5 to 95% non-condensing
Variable speed fans

## Regulatory

For international availability, please contact [sales@meraki.com](mailto:sales@meraki.com)

CSA-US (US, Canada)
FCC (USA)
IC (Canada)
CE (Europe)
RCM (Australia/New Zealand)
RoHS

## Warranty

Full lifetime hardware warranty with next-day advanced replacement included
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## MTBF Rating

Model	MTBF at 25°C
MS350-24	808,000
MS350-24P	568,000
MS350-24X	321,515
MS350-48	588,000
MS350-48LP	536,000
MS350-48FP	518,000