

HP MSM Controller Series



Key features

- Ease of use, scalability, and redundancy
- Enhanced architecture for flexible network design
- Supports IEEE 802.11a/b/g/n and .11ac AP and access devices
- Comprehensive WLAN security
- Appliance and blade form factors

Product overview

Working in unison with HP Access Points, the HP MSM Controller Series delivers a high-performance networking solution. The enhanced controller architecture scales to new WLAN standards without requiring a controller replacement. The MSM controllers provide advanced Radio Resource Management (RRM), including client load balancing and interference mitigation. The MSM wireless controllers also support a fast-roaming capability.

Wireless security is comprehensive with integrated wireless IDS and support for internal and external Authentication, Authorization, and Accounting (AAA) servers; a built-in stateful firewall; per-user VLAN mapping; and authentication.

Features and benefits

Management

- Wi-Fi Clear Connect

Provides a system-wide approach to delivering WLAN reliability by proactively determining and adjusting to changing RF conditions; optimizes WLAN performance by detecting interference from Wi-Fi and non-Wi-Fi sources—by using spectrum analysis capabilities built into the specific access points (refer to the HP Access Point—Controller compatibility matrix), identifying rogue activity and making decisions at a system-wide level.

- Advanced radio resource management

- Automatic radio power adjustments

Include real-time power adjustments based on changing environmental conditions and signal coverage adjustment

- Automatic radio channel

Provides intelligent channel switching and real-time interference detection

- Intelligent client load balancing

Determines the number of clients across neighboring APs and adjusts client allocation to balance the load

- Airtime fairness

helps ensure equal RF transmission time for wireless clients

- Spectrum analysis

- Power/frequency spectrum analysis

Measures noise from IEEE 802.11 remote sources

- Signal detection/classification

Identifies source of RF interference; for example, Bluetooth, cordless phones, and microwave ovens

- Evaluation of channel quality

Helps detect severe channel degradation and improves the reporting of poor RF performance

- Automated work flows

- Initial controller settings

Defines basic operational settings for the controller; for example, network connections, security settings, and system time

- Wireless network for employees

Enables setup of a new wireless network for employees; for example, network and security settings, and basic voice and video settings

- Wireless network for guests

Provides wireless access for guest users; for example, network and security settings specific to guest access

- Dashboard Monitoring and Analytics
 - Allow administrators to monitor and troubleshoot their HP WLAN infrastructure at a glance
 - Provide analytical visibility into multiple areas such as: Wireless Clients, Access Points and Alarms utilizing intuitive graphics and colors
 - Display a quick operational health assessment of the Wi-Fi network and easy identification of potential issues
- Support for environments using Bonjour services
 - Gateway
 - Allows discovery of Bonjour services located in a different layer-3 network
 - HP Zerocast
 - Eliminates Bonjour multicast traffic from the WLAN enabling scalable deployment of Apple devices with no performance impact on the Wi-Fi network
 - Access control
 - Enables filters to be applied inbound and outbound (on the AP) to SSIDs, groups of or specific APs. User based filtering can block Bonjour traffic until the user is authenticated
- Remote configuration and management
 - Are available through a secure Web browser, command-line interface (console port or SSH), SOAP, or SNMP
- Management interface control
 - Allows interfaces to be enabled or disabled depending on security preferences
- Management VLAN
 - Segments traffic to and from management interfaces, including CLI, Web browser interface, and SNMP
- RADIUS accounting support
 - separates RADIUS accounting server support per SSID; provides detailed session, usage, and billing information for each client activity
- Logging
 - provides local and remote logging of events via SNMP (v2c and v3) and syslog; provides log throttling and log filtering to reduce the number of log events generated
- Controller networking
 - Includes IEEE 802.1D-compliant bridging and bridge MIB (RFC 4188), which is supported only on a primary bridge interface; stateful firewall; PPPoE client (RFC 2516); ICMP (RFC 792); IEEE 802.1Q VLAN tagging; NAT (RFC 1631); CIDR (RFC 1519); L2TP and PPTP servers for wireless clients; VPN client, which establishes PPTP or IPsec tunnels to other devices; and IGMP snooping (IGMP proxy v1 and v2), which is supported on the wireless interfaces of APs
- DHCP support
 - Includes RFC 2131 and RFC 3046 (DHCP relay option 82) for server and built-in DHCP client for client
- Band steering
 - Redirects 5 GHz-capable clients automatically to the less-congested 5 GHz spectrum

- **Controller management**
Provides a secure Web browser (Secure Sockets Layer [SSL] and VPN), command-line interface, SOAP, SNMP v2c and v3, MIB-II with traps, RADIUS Authentication Client MIB (RFC 2618), and RIPv2 MIB extension (RFC 1724); implements scheduled configuration and firmware upgrades from a central server; offers per-user activity records by time used or data transferred; and supports remote syslog
- **HP Intelligent Management Center (IMC) and Wireless Services Manager Software**
Provide centralized management for discovery, logging, status, and configuration management
- **Unified network visibility**
Provides visibility between a wired and wireless network, using the IEEE 802.1AB Link Layer Discovery Protocol (LLDP) and sFlow
- **Diagnostics**
Records association, authentication, and DHCP events in client event log; includes a packet capture tool for Ethernet and IEEE 802.11 interfaces (PCAP format), a wireless client data rate matrix, and a client status page; complete session logging provides detailed information for problem identification and resolution
- **New Group Bandwidth Management**
Ability to assign users to groups and control bandwidth by group

Firewall

- **Stateful firewall**
enforces firewall policies to control traffic and filter access to network services; maintains session information for every connection passing through it, enabling the firewall to control packets based on existing sessions
- **NAT/PAT**
Leverages a choice of dynamic partial address translation (PAT) or static network address translation (NAT) preserves a network's IP address pool or conceals the private address of network resources such as Web servers, which are made accessible to users of a guest or public wireless LAN
- **Authenticated network access**
Authenticates users with an internal or external RADIUS server or Microsoft® Active Directory before allowing full network connectivity

Quality of Service (QoS)

- **Rate limiting**
Supports per-wireless client, ingress-enforced maximums and per-wireless client, per-queue guaranteed minimums
- **Centralized traffic**
Layer 2 and Layer 3 QoS settings are maintained when using the Mobility Traffic Manager or guest access

Mobility

- **HP MSM solutions enhanced for businesses**
Delivers services for a range of vertical markets, including healthcare, hospitality, education, manufacturing, transportation, and service providers
- **Powerful security capabilities**
Enables robust identity- and role-based user account profiles to use internal or external AAA services

- Solutions that cover the most important WLAN applications
 - Deliver rich application support, including guest access, location-based services, Voice over Wi-Fi (VoW), hotspot, surveillance, and secure point of sale
- Capacity that scales from small office to large campus
 - Deploy wireless LANs (WLANs) efficiently with the MSM720 controller (which supports 10 to 40 APs) and the MSM760, MSM765 zl, and MSM775 zl controllers (which control 40 to 200 APs)
- Premium Mobility scalability features
 - Virtual Controller
 - Managed by a single IP address the MSM76x and MSM775 zl each support a team of up to 800 APs and five controllers and the MSM720 a team of up to 40 APs across two controllers (a team requires the same controller type)
 - N+1 redundancy
 - Teaming provides N+1 redundancy
 - Seamless failover
 - APs can fail-over without rebooting, preserving mobility services when client traffic is bridged locally at the AP
 - 64 VSC profiles
 - can be defined
- Mobility Traffic Manager
 - Provides flexible and multiple network distribution schemes address a range of business needs; policies for user network and security profiles are consistently applied and enforced; wireless traffic can be directed anywhere in the network as required; enterprise businesses can easily migrate to the MSM mobility solution, preserving prior network designs
- Controller client access control
 - provides SSL-protected universal access method, MAC address authentication, and IEEE 802.1x authentication; Web proxy server; support for centralized portal; AAA Security; WPA and WPA2 encryption; client-fixed IP address spoofing; per-site and per-user access lists; white list and black list support; bandwidth limiting per user, per VLAN, or per VSC; and concurrent users (250 for the MSM720, and 2,000 for the MSM760, MSM765 zl and MSM775 zl controllers)
- Simplified management with central control
 - Reduces the time and complexity of managing a wireless network; the solution controls up to hundreds of APs (depending on the controller) from a single management interface and helps ensure that a consistent set of services is delivered throughout the wireless network; and the controllers push authentication, encryption, QoS enforcement, and access policies to the APs, delivering intelligence to the edge of mobile networks
- Services
 - Provides standard L2 roaming and VoWLAN support on all controllers, advanced fast roaming on mobility controllers, plug-and-play AP management, as well as public and guest Internet access
- Advanced fast roaming (requires a mobility controller or upgrade)
 - Provides WPA2 opportunistic key caching through controller support as well as inter/intra-subnet roaming and seamless roaming (less than 50 ms roaming delay) support for VoW deployments

Security

- Integrated IDS support (Premium Mobility version required)
 - Automated AP and client classification
 - reduces manual effort (administrator can override AP classification)
 - Comprehensive detection capabilities
 - detects a wide range of attacks
 - Flexible event reporting
 - enables configuration of which events will result in notifications
 - Location tracking capabilities
 - helps identify the location of a rogue device
 - Flexible deployment models
 - supports time slicing or dedicating a radio to detect full time
- Secure shell
 - encrypts all transmitted data for secure remote CLI access over IP networks
- Secure Sockets Layer (SSL)
 - encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch
- IEEE 802.1X, Active Directory, and RADIUS network logins
 - Control wireless network access for authentication and accountability, using the IEEE 802.1X, Microsoft Active Directory, and RADIUS
- RADIUS-based MAC authentication
 - authenticates a wireless client with a RADIUS server based on the MAC address of the client; this is useful for clients with minimal or no user interface
- Web-based authentication
 - Provides a Web browser-based environment to authenticate clients that may not support the IEEE 802.1X supplicant
- IEEE 802.1X supplicant on MSM APs
 - Helps prevent deployment of rogue networking equipment
- Secure management access
 - Encrypts all access methods (CLI, GUI, or MIB) securely through SSH v2c, SSL, and/or SNMPv3

Policy management

- Standards-based authentication support for Microsoft Active Directory and IEEE 802.1X
 - Integrates seamlessly into existing authentication services or uses the built-in database
- Integration with HP IMC Network Management software
 - Helps ensure consistent policy enforcement across wired and wireless networks

Connectivity

- 10GbE connections to the switch fabric (the MSM765 zl and MSM775 zl premium mobility controllers only)

Leverages two 10GbE wire-speed internal connections to help ensure that the network connections from the application to the switch backplane do not limit application performance

- IPv6 wireless client traffic forwarding

Is supported for L2 and L3 mobility (MTM) and for client traffic directly bridged at the APs

- IEEE 802.3ad link-aggregation control protocol (LACP) and HP port trunking (the MSM720 controller only)

Support up to six ports bonded via LACP; and facilitates manually configured trunks between an HP switch and the controller

Comprehensive portfolio

- Access point support

Refer to the HP Access Point—Controller Compatibility Matrix (h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA5-0345ENW&cc=us&lc=en).

Performance

- High-performance processor system

– MSM720 controllers

Freescale Dual Core 800 MHz P1020 Processor, 256 KB cache, and 1 GB DDR3 memory

– MSM760 controllers

Intel® Core™ 2 Duo Processor E6400, 2.13 GHz, and 2 MB cache

– MSM765 zl controller

Intel Core 2 Duo Processor T7500, 2.2 GHz, and 4 MB cache

– MSM775 zl controller

Intel® Ivy Bridge Dual Core CPU Core i3-3120ME, 2.4 GHz, and 3 MB cache

- Memory subsystems

– MSM720 controllers

1 GB of DDR3 memory

– MSM760 controllers

2 GB of DDR2 memory

– MSM765 zl controllers

4 GB of DDR2 memory

– MSM775 zl controllers

4 GB ECC DDR3-1333 SO-DIMM

- Disk drive (MSM76x models)

Enables rapid data reads/writes via the 250 GB SATA II 7200 rpm hard disk drive, providing improved application performance

- Solid state drive (MSM775 zl model)

Enables rapid data reads/writes via the 32 GB SATA solid state drive (SSD), providing improved application performance

Additional information

- Licensing model for guest user access (v5.7 and later)

The full number of supported guest access user sessions is enabled with the base-level controller models and is no longer tied to the AP upgrade license; for example, the base MSM720 (access and premium mobility) controllers will now support 250 concurrent guest access user sessions and the MSM76x base controllers will now support 2,000 guest access user sessions without requiring additional AP license upgrades

- 10-AP license upgrade option

This can be used on the MSM720, MSM76x, and MSM775 zl products on all supported firmware releases

- Licensing model for the MSM317 access device (v5.7 and later)

No additional AP license is required for the MSM317; non-MSM317 devices are subject to AP licensing; maximum wireless device limits per controller and team are unchanged, and all devices count toward these maximums; for example, an MSM760 could manage 200 MSM317 devices with no additional AP license, 40 APs and 160 MSM317 devices with no additional AP license; or 80 APs and 120 MSM317 devices with an additional 40-AP license

- AP support

Refer to the HP Access Point—Controller Compatibility Matrix at h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA5-0345ENW&cc=us&lc=en

Warranty and support

- Limited Lifetime Warranty 2.0—5y HDD

Advance hardware replacement for as long as you own the MSM720 and MSM765 zl controllers, with the exception of the hard disk drive in the MSM765 zl controller (which comes with a 5-year warranty); and next-business-day delivery (available in most countries)¹

- Limited Lifetime Warranty 2.0

Advance hardware replacement for as long as you own the MSM775 zl controller with next-business-day delivery (available in most countries)

- Electronic and telephone support (for Limited Lifetime Warranty 2.0)

limited 24x7 telephone support is available from HP for the first 3 years; limited electronic and business hours telephone support is available from HP for the entire warranty period; to reach our support centers, refer to hp.com/networking/contact-support; for details on the duration of support provided with your product purchase, refer to hp.com/networking/warrantysummary

- 1-year Warranty 2.0

Advance hardware replacement for the MSM760 controller with next-business-day delivery (available in most countries)

- Electronic and telephone support (for Warranty 2.0)

limited electronic and 24x7 telephone support is available from HP for the entire warranty period; to reach our support centers, refer to hp.com/networking/contact-support; for details on the duration of support provided with your product purchase, refer to hp.com/networking/warrantysummary

- Software releases and warranty

The MSM720 and MSM775 zl controllers include all offered software releases for as long as you own the products; the MSM765 zl and MSM760 controllers include one year of bug fixes; for details on the software releases available with your product purchase, visit hp.com/networking/warrantysummary; to find software for your product, visit hp.com/networking/support

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Specifications

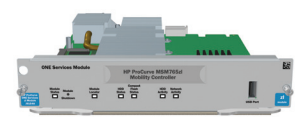


	HP MSM720 Premium Mobility Controller (WW) (J9694A)	HP MSM720 Access Controller (WW) (J9693A)	HP MSM760 Premium Mobility Controller (J9420A)
I/O ports and slots	4 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 2 RJ-45 dual-personality 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T)	4 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only 2 RJ-45 dual-personality 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T)	2 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only
Additional ports and slots	1 RJ-45 serial console port	1 RJ-45 serial console port	1 RJ-45 serial console port
Physical characteristics			
Dimensions	6.28(w) x 10(d) x 1.75(h) in (15.95 x 25.4 x 4.45 cm) (1U height)	6.28(w) x 10(d) x 1.75(h) in (15.95 x 25.4 x 4.45 cm) (1U height)	17.32(w) x 15.38(d) x 1.75(h) in (43.99 x 39.07 x 4.45 cm) (1U height)
Weight	3.62 lb (1.64 kg)	3.62 lb (1.64 kg)	13.45 lb (6.1 kg)
Mounting and enclosure	Supports the mounting options of the 2520-8 PoE switch, including EIA-standard 19 in. telco rack or equipment cabinet (rack-mounting kit included); horizontal surface or wall mounting	Supports the mounting options of the 2520-8 PoE switch, including EIA-standard 19 in. telco rack or equipment cabinet (rack-mounting kit included); horizontal surface or wall mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance			
100 Mb Latency	< 20.4 μ s (LIFO 64-byte packets)	< 20.4 μ s (LIFO 64-byte packets)	
1000 Mb Latency	< 6.3 μ s (LIFO 64-byte packets)	< 6.3 μ s (LIFO 64-byte packets)	
Throughput	up to 8.9 million pps	up to 8.9 million pps	
Environment			
Operating temperature	41°F to 113°F (5°C to 45°C)	41°F to 113°F (5°C to 45°C)	41°F to 104°F (5°C to 40°C)
Operating relative humidity	15% to 95% @ 104°F (40°C)	15% to 95% @ 104°F (40°C)	15% to 80%, noncondensing
Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 149°F (-40°C to 65°C)
Nonoperating/Storage relative humidity	15% to 95% @ 149°F (65°C)	15% to 95% @ 149°F (65°C)	15% to 80%, noncondensing

	HP MSM720 Premium Mobility Controller (WW) (J9694A)	HP MSM720 Access Controller (WW) (J9693A)	HP MSM760 Premium Mobility Controller (J9420A)
Electrical characteristics			
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Maximum heat dissipation	70 BTU/hr (73.85 kJ/hr)	70 BTU/hr (73.85 kJ/hr)	434 BTU/hr (457.87 kJ/hr)
AC voltage	100 - 240 VAC	100 - 240 VAC	100 - 240 VAC
Current	.2/1 A	.2/1 A	2/1 A
Maximum power rating	20 W	20 W	127 W
Safety	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1
Emissions	FCC part 15 Class A; EN 55022 Class A; CISPR 22 Class A; ICES-003	FCC part 15 Class A; EN 55022 Class A; CISPR 22 Class A; ICES-003	FCC part 15 Class A; EN 55022 Class A; CISPR 22 Class A; ICES-003
Features	<p>Supported:</p> <ul style="list-style-type: none"> • IEEE 802.11 a/b/g/n and .11ac access points and devices • 10 to 40 access points and/or access devices (in increments of 10) • IEEE 802.3ad Link Aggregation Control Protocol (LACP) • Up to 250 concurrent total users • Up to 80 VLAN interfaces • Up to 4094 VLAN ID's <p>Included services:</p> <ul style="list-style-type: none"> • Plug-and-play AP management and WLAN management • Guest access • Captive portal • PCI DSS compliance for wireless PoS traffic • Support for Real-Time Location Services (RTLS) • Advanced fast roaming with VoWLAN support • Mobility Traffic Manager (MTM) • Support for up to 64 VSC profiles • Unified policy enforcement and network visibility • Virtual controller (up to two MSM720 controllers and 40 APs with resiliency; 250 maximum concurrent users) • Group bandwidth management 	<p>Supported:</p> <ul style="list-style-type: none"> • IEEE 802.11 a/b/g/n and .11ac access points and devices • 10 to 40 access points and/or access devices (in increments of 10) • IEEE 802.3ad Link Aggregation Control Protocol (LACP) • Up to 250 concurrent total users • Up to 80 VLAN interfaces • Up to 4094 VLAN ID's <p>Included services:</p> <ul style="list-style-type: none"> • Plug-and-play AP management and WLAN management • Guest access • Captive portal • PCI DSS compliance for wireless PoS traffic • Support for Real-Time Location Services (RTLS) • Standard Layer 2 roaming with VoWLAN support • Support for up to 16 VSC profiles • Unified policy enforcement and network visibility • Group bandwidth management 	<p>Supported:</p> <ul style="list-style-type: none"> • IEEE 802.11 a/b/g/n and .11ac access points and devices • 40 to 200 access points and/or access devices (in increments of 10 or 40) • IEEE 802.3ad Link Aggregation Control Protocol (LACP) • Up to a maximum of 2,000 concurrent total users • Up to 200 VLAN interfaces • Up to 4094 VLAN ID's <p>Included services:</p> <ul style="list-style-type: none"> • Plug-and-play AP management and WLAN management • Guest access • Captive portal • PCI DSS compliance for wireless PoS traffic • Support for Real-Time Location Services (RTLS) • Advanced fast roaming with VoWLAN support • Mobility Traffic Manager (MTM) • Support for up to 64 VSC profiles • Unified policy enforcement and network visibility • Virtual controller (up to five MSM760 controllers and 800 APs with resiliency). When controllers are teamed the limit remains 2000 concurrent users regardless of the number of controllers in the team. • Group bandwidth management
Notes	<p>Latency values refer to client traffic bridged locally at the AP.</p> <p>Not all services are supported with the Virtual Controller feature. Please refer to the user documentation for more detail.</p>	<p>Latency values refer to client traffic bridged locally at the AP.</p> <p>Not all services are supported with the Virtual Controller feature. Please refer to the user documentation for more detail.</p>	<p>Latency values refer to client traffic bridged locally at the AP.</p> <p>Not all services are supported with the Virtual Controller feature. Please refer to the user documentation for more detail.</p>
Services	Refer to the HP website at hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	Refer to the HP website at hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	Refer to the HP website at hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

HP MSM Controller Series

Specifications (continued)



	HP MSM760 Access Controller (J9421A)	HP MSM775 zL Premium Controller Module (J9840A)	HP MSM765 zL Premium Mobility Controller (J9370A)
I/O ports and slots	2 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only		
Additional ports and slots	1 RJ-45 serial console port		
Physical characteristics			
Dimensions	17.32(w) x 15.38(d) x 1.75(h) in (43.99 x 39.07 x 4.45 cm) (1U height)	8.13(w) x 9.75(d) x 1.75(h) in (20.65 x 24.77 x 4.45 cm)	8.13(w) x 10.3(d) x 1.75(h) in (20.65 x 26.16 x 4.45 cm)
Weight	13.45 lb (6.1 kg)	2.65 lb (1.2 kg)	2.05 lb (0.93 kg)
Mounting and enclosure	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Can be installed in any of the following chassis: HP5406R zL2 (J9821A), 5412R zL2 (J9822A), HP 5406 zL (J8697A), 5412 zL (J8698A), HP 8206 zL (J9640A), and 8212 zL (J8715A).	Can be installed in any of the following chassis: HP 5406 zL (J8697A), 5412 zL (J8698A), and 8212 zL (J8715A)
Environment			
Operating temperature	41°F to 104°F (5°C to 40°C)	32°F to 113°F (0°C to 45°C)	32°F to 113°F (0°C to 45°C)
Operating relative humidity	15% to 80%, noncondensing	15% to 95% @ 104°F (40°C), noncondensing	15% to 95% @ 131°F (55°C), noncondensing
Nonoperating/Storage temperature	-40°F to 149°F (-40°C to 65°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Nonoperating/Storage relative humidity	15% to 80%, noncondensing	15% to 90% @ 149°F (65°C), noncondensing	15% to 95%, noncondensing
Altitude		up to 10,000 ft (3 km)	
		Note Non-operating/Storage Altitude up to 15,000 ft (4.6 km) The SSD has a maximum operational wet bulb temperature of 35°C (95°F) and a maximum non-operational wet bulb temperature of 40°C (104°F)	

	HP MSM760 Access Controller (J9421A)	HP MSM775 zl Premium Controller Module (J9840A)	HP MSM765 zl Premium Mobility Controller (J9370A)
Electrical characteristics			
Frequency	50/60 Hz	188 BTU/hr (198.34 kJ/hr)	272 BTU/hr (287 kJ/hr)
Maximum heat dissipation	434 BTU/hr (457.87 kJ/hr)		
AC voltage	100 - 240 VAC		
Current	2/1 A		
Maximum power rating	127 W	55 W	80 W
Idle power		30 W	36 W
Note			
		Idle power is the actual power consumption of the device with no ports connected.	Idle power is the actual power consumption of the device with no ports connected.
Safety			
	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1	UL 60950-1; IEC 60950-1; EN 60950-1; CAN/CSA-C22.2 No. 60950-1
Emissions			
	FCC part 15 Class A; EN 55022 Class A; CISPR 22 Class A; ICES-003	FCC part 15 Class A; EN 55022 Class A; CISPR 22 Class A; ICES-003	FCC part 15 Class A; EN 55022 Class A; CISPR 22 Class A; ICES-003
Features			
	<p>Supported:</p> <ul style="list-style-type: none"> • IEEE 802.11 a/b/g/n and .11ac access points and devices • 40 to 200 access points and/or access devices (in increments of 10 or 40) • Up to a maximum of 2,000 guest access users • Up to 200 VLAN interfaces • Up to 4094 VLAN ID's <p>Included services:</p> <ul style="list-style-type: none"> • Plug-and-play AP management and WLAN management • Guest access • Captive portal • PCI DSS compliance for wireless PoS traffic • Support for Real-Time Location Services (RTLS) • Standard Layer 2 roaming with VoWLAN support • Support for up to 16 VSC profiles • Unified policy enforcement and network visibility • Group bandwidth management 	<p>Supported:</p> <ul style="list-style-type: none"> • IEEE 802.11 a/b/g/n and .11ac access points and devices • 40 to 200 access points and/or access devices (in increments of 10 or 40) • Up to a maximum of 2,000 guest access users • Up to 200 VLAN interfaces • Up to 4094 VLAN ID's <p>Included services:</p> <ul style="list-style-type: none"> • Plug-and-play AP management and WLAN management • Guest access • Captive portal • PCI DSS compliance for wireless PoS traffic • Support for Real-Time Location Services (RTLS) • Advanced fast roaming with VoWLAN support • Mobility Traffic Manager (MTM) • Support for up to 64 VSC profiles • Unified policy enforcement and network visibility • Group bandwidth management • Virtual controller (up to five MSM775 zl controllers and 800 APs with resiliency) • The MSM775zl module has a 2000 concurrent user limit. When controllers are teamed the limit remains 2000 concurrent users regardless of the number of modules in the team <p>The MSM775 zl module provides a module reset switch on the front panel. Refer to the user documentation for more detail.</p> <p>The MSM775 zl module has a USB port on the front panel. Use of this port is not supported.</p>	<p>Supported:</p> <ul style="list-style-type: none"> • IEEE 802.11 a/b/g/n and .11ac access points and devices • 40 to 200 access points and/or access devices (in increments of 10 or 40) • Up to a maximum of 2,000 guest access users • Up to 200 VLAN interfaces • Up to 4094 VLAN ID's <p>Included services:</p> <ul style="list-style-type: none"> • Plug-and-play AP management and WLAN management • Guest access • Captive portal • PCI DSS compliance for wireless PoS traffic • Support for Real-Time Location Services (RTLS) • Advanced fast roaming with VoWLAN support • Mobility Traffic Manager (MTM) • Support for up to 64 VSC profiles • Unified policy enforcement and network visibility • Virtual controller (up to five MSM765 zl controllers and 800 APs with resiliency) • Group bandwidth management

	HP MSM760 Access Controller (J9421A)	HP MSM775 zl Premium Controller Module (J9840A)	HP MSM765 zl Premium Mobility Controller (J9370A)
Notes		<ul style="list-style-type: none"> • Not all services are supported with the Virtual Controller feature. Please refer to the user documentation for more detail. • MSM775 zl modules can only be teamed with other MSM775 zl modules. • Chassis Configuration Guidelines: <ul style="list-style-type: none"> – No more than six zl modules can be installed in a zl or zl2 chassis. – There are no restrictions on what slots the MSM775 zl modules are inserted into. – Maximum chassis operating temperature specifications of the zl chassis when the MSM775 zl module is installed is 45°C. Note that the maximum temperature of the chassis is determined by the module with the lowest operating temperature. 	<ul style="list-style-type: none"> • A maximum of four MSM765 zl controllers can be installed in the same chassis, and a maximum of three MSM765 zl controllers are supported in the 5406 zl switch. • The MSM765 zl module has a 2000 concurrent user limit. When controllers are teamed the limit remains 2000 concurrent users regardless of the number of modules in the team. • Not all services are supported with the Virtual Controller feature. Please refer to the user documentation for more detail.
Services	<p>Refer to the HP website at hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>	<p>Refer to the HP website at hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>	<p>Refer to the HP website at hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.</p>

Standards and Protocols

(applies to all products in series)

Device management	RFC 1155 Structure and Mgmt Information (SMlv1) RFC 1157 SNMPv1/v2c RFC 1305 NTPv3 RFC 1591 DNS (client)	RFC 1901 (Community based SNMPv2) RFC 2030 SNMP RFC 2578-2580 SMLv2 RFC 2580 (SMLv2 Conformance)	RFC 2616 HTTP RFC 2782 DNS SRV RFC 3410 (Management Framework) RFC 3416 (SNMP Protocol Operations v2) RFC 3417 (SNMP Transport Mappings)
General protocols	IEEE 802.11i Wireless Security IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1X PAE IEEE 802.3ab 1000BASE-T Gigabit Ethernet over twisted pair (10/100/1000 models only) IEEE 802.3x Flow Control RFC 768 UDP	RFC 791 IP RFC 792 ICMP RFC 793 TCP RFC 826 ARP RFC 1122 Host Requirements RFC 1213 Management Information Base for Network Management of TCP/IP-based internets	RFC 1305 NTPv3 (IPv4 only) RFC 1519 CIDR RFC 1542 BOOTP RFC 2131 DHCP RFC 3176 sFlow RFC 4446 IANA Allocations for Pseudowire Edge to Edge Emulation (PWE3)
MIBs	RFC 1156 (TCP/IP MIB) RFC 1157 A Simple Network Management Protocol (SNMP)	RFC 1212 Concise MIB Definitions RFC 1213 MIB II	RFC 2578 Structure of Management Information Version 2 (SMLv2) RFC 2863 The Interfaces Group MIB
Network management	IEEE 802.1AB Link Layer Discovery Protocol (LLDP) IEEE 802.1D (STP) RFC 1155 Structure of Management Information RFC 1157 SNMPv1 RFC 1212 Concise MIB definitions RFC 1215 Convention for defining traps for use with the SNMP RFC 1901 SNMPv2 Introduction RFC 2578 SMLv2	RFC 2578 Structure of Management Information Version 2 (SMLv2) RFC 2580 Conformance Statements for SMLv2 RFC 3164 BSD syslog Protocol RFC 3410 Introduction to Version 3 of the Internet-standard Network Management Framework RFC 3411 SNMP Management Frameworks RFC 3412 SNMPv3 Message Processing	RFC 3413 Simple Network Management Protocol (SNMP) Applications RFC 3414 SNMPv3 User-based Security Model (USM) RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP) RFC 3584 Coexistence between Version 1 and Version 2 of the Internet-standard Network Management Protocol (SNMP)
Security	RFC 1321 The MD5 Message-Digest Algorithm RFC 1851 ESP Triple DES Transform RFC 2104 Keyed-Hashing for Message Authentication RFC 2246 Transport Layer Security (TLS) RFC 2401 Security Architecture for the Internet Protocol RFC 2408 Internet Security Association and Key Management Protocol (ISAKMP)	RFC 2409 The Internet Key Exchange (IKE) RFC 2548 Microsoft Vendor-specific RADIUS Attributes RFC 2716 PPP EAP TLS Authentication Protocol RFC 2865 RADIUS Authentication RFC 2866 RADIUS Accounting RFC 3579 RADIUS Support For Extensible Authentication Protocol (EAP)	RFC 3580 IEEE 802.1X RADIUS Guidelines RFC 3686 Using AES Counter Mode with IPsec ESP AES: CCM, CCMP SSL and TLS: RC4 128-bit and RSA 1024- and 2048-bit Web Authentication WPA (Wi-Fi Protected Access) WPA (Wi-Fi Protected Access)/WPA2
IPSec	RFC 2403 The Use of HMAC-MD5-96 within ESP and AH RFC 2404 The Use of HMAC-SHA-1-96 within ESP and AH	RFC 2406 IP Encapsulating Security Payload RFC 2407 - Domain of interpretation	RFC 2451 The ESP CBC-Mode Cipher Algorithms RFC 3602 The AES-CBC Cipher Algorithm and Its Use with IPsec
IKEv1	RFC 2407 The Internet IP Security Domain of Interpretation for ISAKMP	RFC 2408 Internet Security Association and Key Management Protocol (ISAKMP). RFC 2409 The Internet Key Exchange (IKE)	RFC 2865 - Remote Authentication Dial In User Service(RADIUS) RFC 3748 - Extensible Authentication Protocol (EAP)
PKI		RFC 3280 Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile	

HP MSM Controller Series accessories

HP MSM720 Premium Mobility Controller (WW) (J9694A)

HP X121 1G SFP LC LX Transceiver (J4859C)
 HP X121 1G SFP LC LH Transceiver (J4860C)
 HP X121 1G SFP RJ45 T Transceiver (J8177C)
 HP X111 100M SFP LC FX Transceiver (J9054C)
 HP X112 100M SFP LC BX-D Transceiver (J9099B)
 HP X112 100M SFP LC BX-U Transceiver (J9100B)
 HP X122 1G SFP LC BX-D Transceiver (J9142B)
 HP X122 1G SFP LC BX-U Transceiver (J9143B)
 HP MSM Additional 10 Access Point E-LTU (J9697AAE)

HP MSM720 Access Controller (WW) (J9693A)

HP X121 1G SFP LC LX Transceiver (J4859C)
 HP X121 1G SFP LC LH Transceiver (J4860C)
 HP X121 1G SFP RJ45 T Transceiver (J8177C)
 HP X111 100M SFP LC FX Transceiver (J9054C)
 HP X112 100M SFP LC BX-D Transceiver (J9099B)
 HP X112 100M SFP LC BX-U Transceiver (J9100B)
 HP X122 1G SFP LC BX-D Transceiver (J9142B)
 HP X122 1G SFP LC BX-U Transceiver (J9143B)
 HP MSM Additional 10 Access Point E-LTU (J9697AAE)
 HP MSM720 Premium E-LTU (J9698AAE)

HP MSM760 Premium Mobility Controller (J9420A)

HP MSM Additional 10 Access Point E-LTU (J9697AAE)
 HP MSM Additional 40 Access Point E-LTU (J9371AAE)

HP MSM760 Access Controller (J9421A)

HP MSM Additional 10 Access Point E-LTU (J9697AAE)
 HP MSM Additional 40 Access Point E-LTU (J9371AAE)
 HP MSM760 Premium E-LTU (J9491AAE)

HP MSM775 zL Premium Controller Module (J9840A)

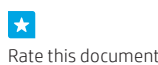
HP MSM Additional 10 Access Point E-LTU (J9697AAE)
 HP MSM Additional 40 Access Point E-LTU (J9371AAE)

HP MSM765 zL Premium Mobility Controller (J9370A)

HP MSM Additional 10 Access Point E-LTU (J9697AAE)
 HP MSM Additional 40 Access Point E-LTU (J9371AAE)

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