



An important breakthrough, Managed Gigabit UPoE+ (bt 90W) Switch for System Integrators. Select your new network engine!

Benchu group SP7500-16PGE4GC-4BT-L2M, an ideal Gigabit Managed UPoE+ Switch, provides a cost-effective advantage to local area networks of SMBs. Offering Layer 2 data packet switching and stable operation, this model also complies with IEEE 802.3bt ultra Power over Ethernet Plus (UPoE+) at an affordable price.

By offering reliable switching technology and advanced networking features, the SP7500-16PGE4GC-4BT-L2M optimizes the installation and power management of network devices such as wireless access points, VoIP phones, and PTZ cameras.

The SP7500-16PGE4GC-4BT-L2M is equipped with 16-10/100/1000BASE-T Gigabit Ethernet ports and 4-1000BASE-T/X RJ45/SFP Combo interfaces with inner power system. Its 4 Gigabit Ethernet ports are integrated with an 802.3bt UPoE+ up to 90W injector function, 12 Gigabit Ethernet ports are integrated with an 802.3at PoE+ up to 30W injector function. It offers a rack-mountable, safe and reliable power solution for SMBs deploying Power over Ethernet networks.

The PoE in-line power following the IEEE 802.3bt/at/af standard makes the SP7500-16PGE4GC-4BT-L2M able to deliver Gigabit speed data and up to 90 watts of power port to 16 PoE compliant powered devices (PDs) with a combined power output budget of up to 500 watts. The SP7500-16PGE4GC-4BT-L2M provides more flexibility in power requirement for all kinds of PDs with affordable installation costs.

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## Highlights

The Benchu group SP7500-16PGE4GC-4BT-L2M UPoE+ Gigabit Smart Switches with Remote Management provides a great value, Adopts the IEEE 802.3bt UPoE+ standard technology, it is capable to source up to 90 watts of power remote PoE compliant powered device (PD). Its an ideal solution for those high power consuming network PDs. with configurable L2 network features like VLANs and PoE operation scheduling, allowing SMB customers to deploy PoE-based VoIP phones, IP cameras, video-over-IP endpoints and Wireless access points simply and securely. Advanced features such as IPv4/IPv6 Layer 3 static routing, LACP link aggregation, ERPS, DHCP, DiffServ QoS, Private VLANs, Multicast VLAN and Spanning Tree will satisfy even the most advanced small business networks.

#### Key features include:

- Complies with IEEE 802.3af/at/bt Power over Ethernet end-span PSE
- Up to 90W of IEEE 802.3af/802.3at/802.3bt devices powered
- Supports PoE power up to 90 watts for 1-4 PoE port, 30 watts for 5-16 PoE port, all power up to 470W PoE budget.
- 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...)
- Layer 3 static routing (IPv4 and IPv6)
- L2/L3/L4 access control lists (ACLs) for granular network access control including 802.1x port authentication
- Advanced QoS (Quality of Service) for traffic prioritization including port-based, 802.1p and L2/L3/L4 DSCP-based
- IGMP Snooping and Querier for multicast optimization
- Dynamic ARP for increased security targeting a class of Man in the Middle attack
- Rate limiting and priority queuing for better bandwidth allocation
- Port mirroring for network monitoring
- Energy Efficient Ethernet (IEEE 802.3az) for maximum power savings
- SNMP v1, v2c and RMON remote monitoring

#### Build a future-proof network with BENCHU:

- Solid performance with non-blocking architecture, 8K MAC addresses, 100 shared (ingress) ACLs and 512 Multicast groups
- Comprehensive IPv6 supporting, QoS, ACL and routing, ensuring investment protection and a smooth migration to IPv6-based network
- PoE+ support on all models and on all ports
- 4 Dedicated SFPs, not only providing fiber uplinks, but also uplink redundancy and failover, improving reliability and availability for the network

#### 802.3bt UPoE+ 90-watt for high power consuming network PD

- Adopts the IEEE 802.bt UPoE+ standard technology, it is capable to source up to 90 watts of power by using all the four pairs of standard Cat5e/6 Ethernet cabling to deliver power and full-speed data to each remote PoE compliant powered device (PD). Its power capability is three times more than that of the conventional 802.3at PoE+ and it is an ideal solution for those high power consuming network PDs.

#### Powerful Network Security

- The SP7500 Series offers comprehensive Layer 2 to Layer 4 Access Control List (ACL) for enforcing security to the edge. It can be used to restrict network access by denying packets based on source and destination IP address, TCP/UDP ports or defined typical network applications. Its protection mechanism also comprises 802.1X Port-based and MAC-based user and device authentication.

#### BENCHU Quality and Reliability

- Contact Discharge 8KV DC; Air Discharge 15KV DC
- -20 to 55 degrees operating temperature
- CE, FCC, RoHS, CB.
- The user-friendly panel can show the device status through the LED indicator of PWR, Link.

#### Easy operation and maintenance management

- Web management, CLI command line (Console, Telnet), SNMP (V1/V2/V3).
- HTTPS, and SSHV1/V2.
- RMON, system log, LLDP, and port traffic statistics.
- CPU monitoring, memory monitoring, Ping test, and cable diagnose.



## Hardware at a Glance

FRONT					REAR		SIDE
Model Name	10/100/1000Base-T RJ45 ports	1Gb RJ45/SFP Combo Ports	UPoE+ 802.3bt Ports	PoE+ 802.3bt Ports	Power Budget	Power Supply	Fans
SP7500-16PGE4GC-4BT-L2M	16	4(Combo)	4 UPoE+	12 PoE+	500W	1 internal PSU, fixed	Fanless

## Software at a Glance

LAYER 2+ / LAYER 3 LITE FEATURES							
Management	IPv4/IPv6 ACL and QoS	IPv4/IPv6 Multicast Filtering	G.8032 ERPS STP/RSTP/MSTP	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 VLAN	LLDP-MED, RADIUS, 802.1X	Yes

## Performance at a Glance

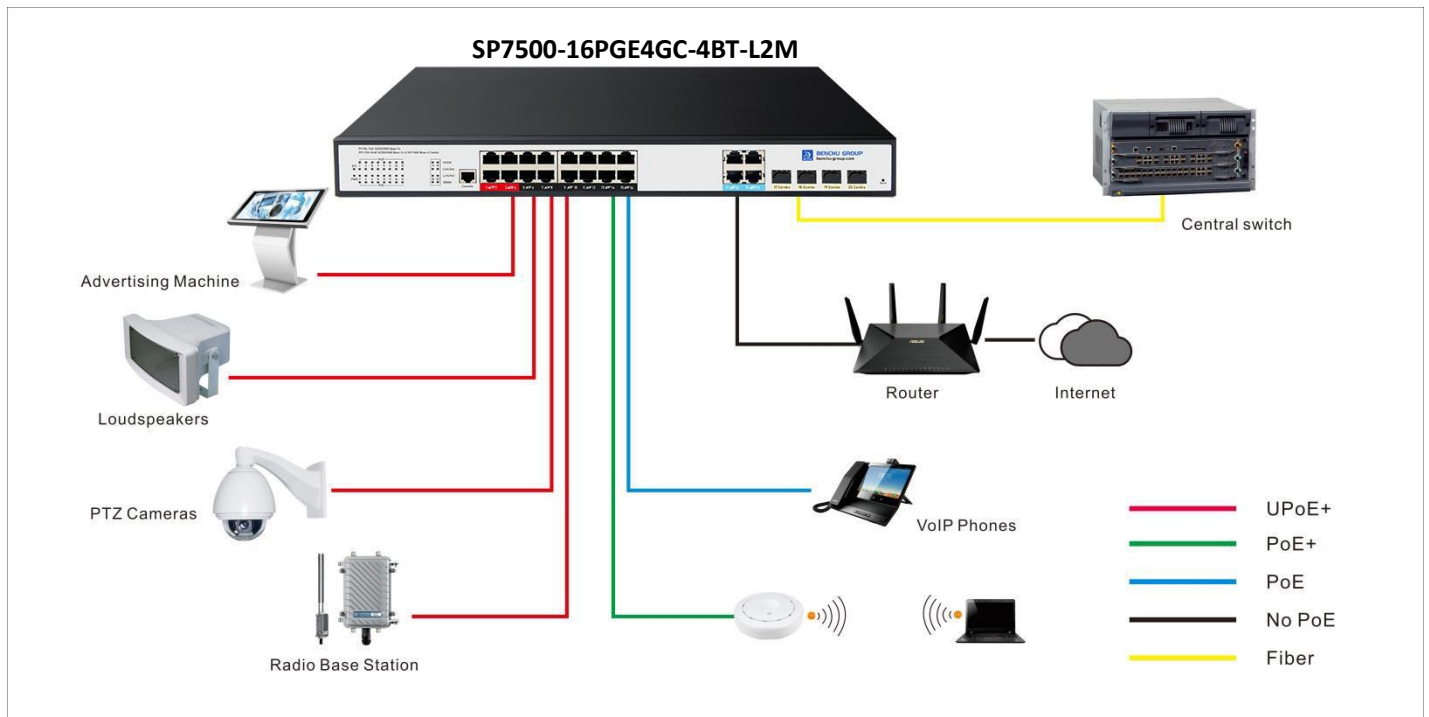
Model Name	Packet buffer	CPU	ACLs	MAC Address Table ARP Table VLANs	Fabric	Latency (Max Connection Speed)	Static Routes (IPv4 & IPv6)	Multicast IGMP Group
SP7500-16PGE4GC-4BT-L2M	12MB	Dual-Core 512GHz MIPS InterAptive CPU subsystem 1GB DDR RAM	100 shared	8K MAC 512 ARP 4K VLANs QinQ	128Gbps 35.72Mpps line-rate	1G Copper: <3.35µs 1G Fiber: <2.5µs	IPv4: 100 IPv6: 100	512

## Features and Benefits

Hardware Features	
1000BASE-T Copper Ethernet PoE+ connections	Support high-density VoIP, Surveillance and Wi-Fi AP deployments, scal-able for future growth. Never face the risk of running out of PoE ports.
1GBASE-X Fiber SFP ports	Four dedicated 1G SFP ports for aggregation to the network core. Support for Fiber and Copper modules. Can also build dual redundancy by a trunked uplink with link aggregation.
Great choice of PoE port counts and PoE power budgets that can adapt to the business's needs	470W PoE budget available across 16 Gigabit PoE+ ports (802.3af/at) – Connect multiple power demanding devices to your network with a single wire for power and connectivity.
Energy Efficient Ethernet (IEEE 802.3az)	Maximum power reduction for onging operational cost savings.
Software Features	
Comprehensive IPv6 Support for Management, ACL 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: <ul style="list-style-type: none"> <li>• 802.1x authentication (EAP)</li> <li>• Port-based security by locked MAC</li> <li>• ACL filtering to permit or deny traffic based on MAC and IP addresses</li> </ul>	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: <ul style="list-style-type: none"> <li>• Port-based or 802.1p-based prioritization</li> <li>• Layer 3-based (DSCP) prioritization</li> <li>• Port-based ingress and egress rate limiting</li> </ul>	Advanced controls for optimized network performance and better delivery of mission-critical traffic such as voice and video.
IGMP (IPv4) and MLD (IPv6) Snooping and Querier modes with Fast Leave	Facilitate fast receiver joins and leaves for multicast streams. Save cost and improve network efficiency by ensuring multicast traffic only reaches desig-nated receivers without the need of an extra multicast router.

## Target Application

### Network Convergence

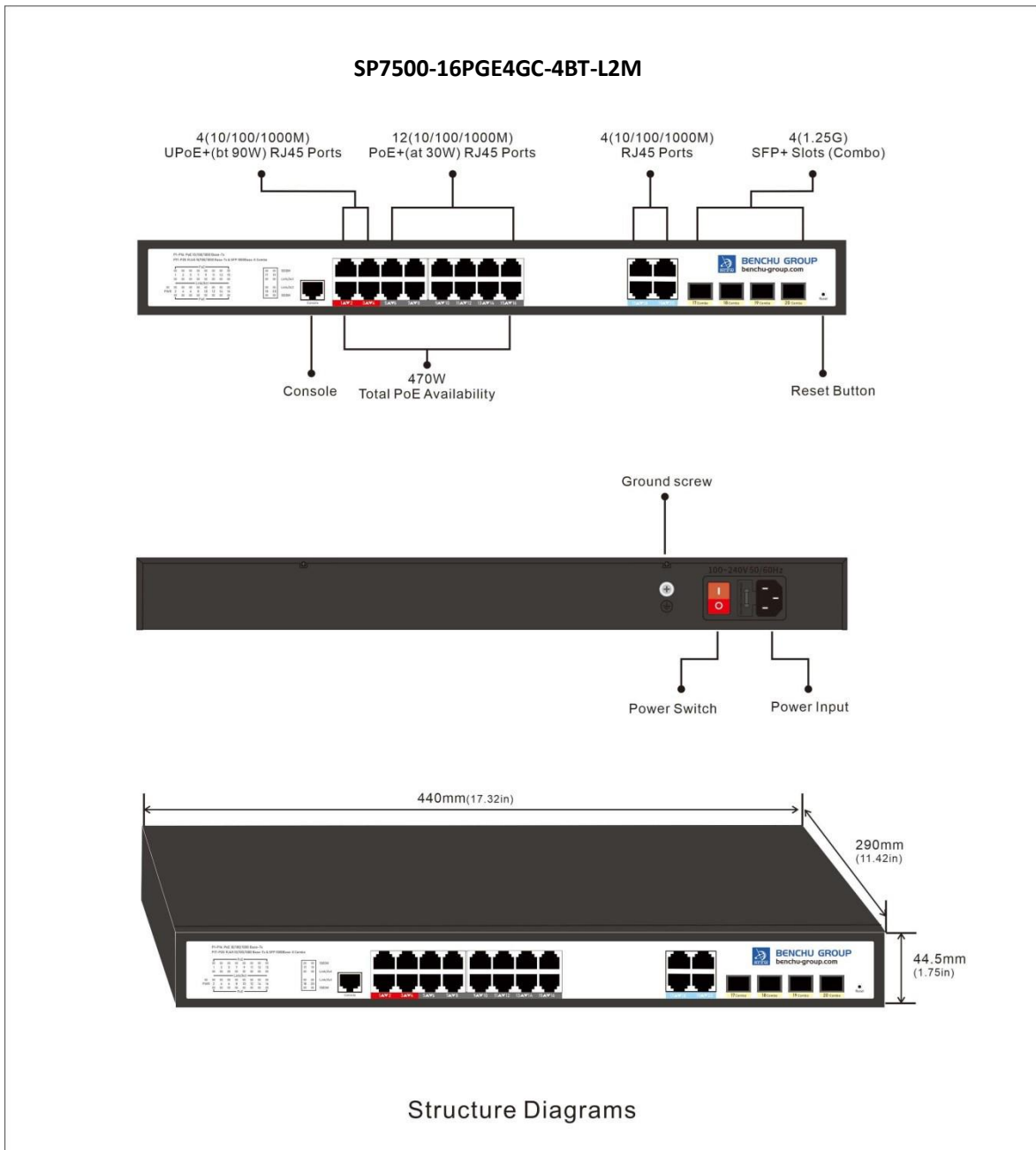


Within small and medium-sized organizations — especially in the hospitality, catering, education, and retail industries — there is growing deployment of VoIP phones, IP security cameras, video-over-IP endpoints, proximity sensors, LED lighting, secure access door locks, and other IoT devices. The dense proximity of these devices requires network switches capable of supporting PoE so a network manager can add power-hungry devices to the network with a single wire for power AND connectivity. Wave 2 802.11ac wireless access points and pan-tilt-zoom HD surveillance cameras with features such as night vision and built-in motion tracking also require PoE+ power (802.3at), increasing the power demands on PoE switches.

The new 16-port BENCHU GROUP Smart UPoE+ Switches support dense deployments of these modern high-power UPoE+ devices. They offer powerful Layer 2 and Layer 3 features for IPv4 and IPv6 with enhanced performance and a focus on usability within SMB environments:

- 470W PoE budget across 4 Gigabit UPoE+ ports and 12 Gigabit PoE+ Ports
- 4 x 1Gb RJ45 and 4 x 1Gb SFP Combo ports for aggregation to the network core to facilitate users' flexible networking
- Comply with IEEE 802.3 af/at/bt PoE power supply standard, automatically identify PoE equipment for power supply.
- Built-in 802.3bt type-4 PoE 90W injector function
- Layer 3 static routing (IPv4 and IPv6) for interVLAN local routing
- IGMP Snooping, IGMP Querier and IGMP Fast Leave for multicast optimization
- ERPS(G.8032) STP/FSTP/MSTP for Ring network and Link protection
- Include VLANs, PoE scheduling, ACLs, DiffServ, LACP, MVR and DHCP
- Easy-to-use Web browser-based management GUI — No need for an IT expert
- Limited Lifetime\* Warranty, Tech support

## Structure Diagrams



Structure Diagrams



Technical Specifications	SP7500-16PGE4GC-4BT-L2M
10M/100M/1000M RJ-45 copper ports	16
1G RJ45/SFP (fiber) ports	4 Combo
Console Port (For config )	Yes
PoE / PoE+/PoE++ ports	4 (up to 90W per port)
PoE / PoE+ ports	12 (up to 30W per port)
Performance Specification	
CPU	Dual-Core 512GHz MIPS InterAptive CPU subsystem
Packet buffer memory (Dynamically shared across only used ports)	8Mb
Forwarding modes	Store-and-forward
Bandwidth	128 Gbps
Priority queues	8
MAC address database size (48-bit MAC addresses)	8K
Multicast groups	512K
Number of IPv4 static routes	100
Number of IPv6 static routes	100
Number of VLANs	4094
Number of VLANs(Open QinQ)	16,760,836(4094*4094)
Number of ARP cache entries	512 ARP
Number of DHCP snooping bindings	256
Access Control Lists (ACLs)	100 shared for MAC, IP and IPv6 ACLs (ingress)
Packet forwarding rate (64 byte packet size) (Mpps)	35.72Mpps
Jumbo frame support (bytes)	Up to 9K packet size
Mean Time Between Failures (MTBF) @ 25°C	135,432 hours
100M Copper Latency (64-byte; 1518-byte; 9216-byte frames)	8.321μs; 8.623μs; 8.449μs
1G Copper Latency (64-byte; 1518-byte; 9216-byte frames)	3.606μs; 3.541μs; 3.615μs
1G Fiber Latency (64-byte; 1518-byte; 9216-byte frames)	2.978μs; 3.105μs; 3.176μs

<b>L2 Services - VLANs</b>	<b>SP7500-16PGE4GC-4BT-L2M</b>
IEEE 802.1Q VLAN tagging	Yes
QinQ VLAN tagging	Yes
IP-based VLANs	Yes
MAC-based VLANs	Yes
Protocol-based VLAN	Yes
Voice VLAN	Yes
VLAN mapping	Yes
<b>L2 Services - Availability</b>	
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
ITU-TG.8032 (ERPS)	Yes, Recovery time < 50ms
<b>L2 Services - Multicast Filtering</b>	
IGMP snooping (v1, v2 and v3)	Yes
MLD snooping support (v1 and v2)	Yes
IGMP snooping querier (v2)	Yes
MLD snooping querier (v1)	Yes
Multicast VLAN Registration (MVR)	Yes
<b>L3 Services - DHCP</b>	
DHCP client	Yes
DHCP snooping	Yes
DHCP server	Yes
<b>L3 Services - Routing</b>	
IPv4 static routing	100
IPv6 static routing	100

Link Aggregation	SP7500-16PGE4GC-4BT-L2M
IEEE 802.3ad - LAGs (LACP)	Yes
Manual LAG	Yes
# of 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	
IEEE 802.1x	Yes
RADIUS accounting	Yes
Access Control Lists (ACLs)	Yes
IP-based ACLs (IPv4 and IPv6)	L2 / L3 / L4
MAC-based ACLs	Yes
TCP/UDP-based ACLs	Yes
Control MAC # static entries	48
Port-based security by locked MAC addresses	Yes
Dynamic ARP inspection	Yes
Quality of Service (QoS)	
Port-based rate limiting	Yes ingress and egress
Port-based QoS	Yes
Support for IPv6 fields	Yes
DiffServ QoS	Yes ingress
IEEE 802.1p COS	Yes
Destination MAC and IP	Yes
Weighted Round Robin (WRR)	Yes
Strict priority queue technology	Yes
Rata limit	Yes

IEEE Network Protocols	SP7500-16PGE4GC-4BT-L2M
<ul style="list-style-type: none"> <li>• IEEE 802.3 Ethernet</li> <li>• IEEE 802.3u 100BASE-T</li> <li>• IEEE 802.3ab 1000BASE-T</li> <li>• IEEE 802.3af PoE</li> <li>• IEEE 802.3at PoE+</li> <li>• IEEE 802.3az Energy Efficient Ethernet (EEE)</li> <li>• IEEE 802.3ad Trunking (LACP)</li> <li>• IEEE 802.3z Gigabit Ethernet 1000BASE-SX/LX</li> </ul>	<ul style="list-style-type: none"> <li>• IEEE 802.3x Full-Duplex Flow Control</li> <li>• IEEE 802.1Q VLAN Tagging</li> <li>• IEEE 802.1AB LLDP with ANSI/TIA-1057 (LLDP-MED)</li> <li>• IEEE 802.1p Class of Service</li> <li>• IEEE 802.1D Spanning Tree (STP)</li> <li>• IEEE 802.1s Multiple Spanning Tree (MSTP)</li> <li>• IEEE 802.1w Rapid Spanning Tree (RSTP)</li> <li>• ITU-TG.8032 Ethernet Ring Protection Switching (ERPS)</li> <li>• IEEE 802.1x RADIUS Network Access Control</li> </ul>
Management, Monitoring & Troubleshooting	
Password management	Yes
Admin access control via RADIUS and TACACS+	Yes
IPv6 management	Yes
SNMP v1/v2c/v3	Yes
RMON group 1,2,3,9	Yes
Port mirroring	Yes ingress and egress
Many-to-one port mirroring	20
Cable test utility	Yes
TLS/HTTPS Web-based access (version)	Yes (v1.2)
File transfers (uploads, downloads)	TFTP / HTTP
HTTP upload/download (firmware)	Yes
LEDs	Yes
Per port	Speed, Link, Activity; or PoE in different mode
Per device	Power, system
Physical Specifications	
Dimensions	440 x 290 x 44.5 mm (17.32 x 11.42 x 1.75 in)
Weight	4.8 kg (10.58 lb)
Power Requirements	AC 100~240V 50/60Hz
Power Consumption (when all ports used, line-rate traffic and max PoE)	500W
Max power (worst case, all ports used, full PoE, line-rate traffic) (Watts)	20W
Idle power consumption (all ports link-down standby) (Watts)	15W
Energy Efficient Ethernet (EEE) IEEE 802.3az	Yes (deactivated by default)
Fan	2 internal fans, fixed

<b>Environmental Specifications</b>		<b>SP7500-16PGE4GC-4BT-L2M</b>
<b>Operating</b>		
Operating Temperature	-20° to 50°C (-4° to 122°F)	
Humidity	90% maximum relative humidity (RH), non-condensing	
Altitude	10,000 ft (3,000 m) maximum	
<b>Storage</b>		
Storage Temperature	-20° to 70°C (-4° to 158°F)	
Humidity (relative)	95% maximum relative humidity, non-condensing	
Altitude	10,000 ft (3,000 m) maximum	
<b>Electromagnetic Emissions and Immunity</b>		
Certifications	CE mark, commercial	
	FCC Part 15 Class A, VCCI Class A	
	Class A EN 55022 (CISPR 22) Class A	
	Class A C-Tick	
	EN 55024	
	CCC	
47 CFR FCC Part 15, SubpartB, Class A ICES-003: 2016 Issue 6, Class A		
ANSI C63.4:2014		
IEC 60950-1:2005 (ed.2)+A1:2009+A2:2013 AN/NZS CISPR 22:2009+A1:2010 CLASS A		
<b>Safety</b>		
Certifications	CB mark, commercial	
	CSA certified (CSA 22.2 #950)	
	EN 60950-1: 2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 IEC 60950-1:2005 (ed.2)+A1:2009+A2:2013	
	AN/NZS 60950.1:2015	
	CCC (China Compulsory Certificate)	
<b>Warranty and Support</b>		
Hardware Limited Warranty	Limited Lifetime*	
Technical Support via Phone and Email*	Limited Lifetime*	
Limited Lifetime* 24x7 Online Chat Technical Support	Limited Lifetime*	
<b>Package Contents</b>		
All models	Smart Managed PoE++ Switch	
	AC Power cord with C13 connector (localized to region of sale)	
	Brackets and screws for rack mounting	
	Rubber protection caps, which are already installed in the SFP sockets Installation guide	
	User's manual	