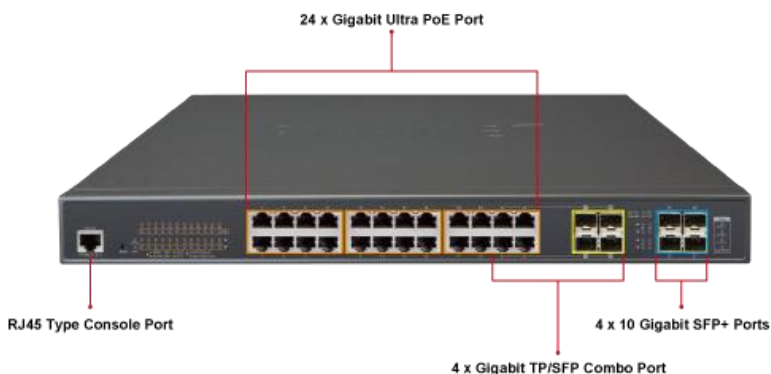


L2+ 24-Port 10/100/1000T Ultra PoE + 4-Port 10G SFP+ Managed Switch



Amazing Ultra PoE Managed Switch with Advanced L2+/L4 Switching and Security

RISK'EXPERT Switch series are cost-optimized, 1U, Gigabit Ultra PoE Managed Switch featuring RISK'EXPERT intelligent PoE functions to improve the availability of critical business applications. It provides IPv6/IPv4 dual stack management and built-in L2+/L4 Gigabit switching engine along with 24 10/100/1000BASE-T ports featuring 75-watt Ultra PoE, 4 Gigabit TP/SFP combo ports and 4 additional 10Gigabit SFP+ ports. With a total power budget of up to 400 watts for different kinds of PoE applications, the Switch series provide a quick, safe and cost-effective ultra PoE network solution for small businesses and enterprises.



Convenient and Smart ONVIF Devices with Detection Feature

RISK'EXPERT has newly developed an awesome feature -- ONVIF Support -- which is specifically designed for co-operating with Video IP Surveillances. From the switch series GUI, clients just need one click to search and show all of the ONVIF devices via network application. In addition, clients can upload floor images into switch and allows for deploying location of surveillance devices for easier inspection and planning. Moreover, clients can get real-time surveillance's information and online/offline status, and also allows PoE reboot control from GUI.

Physical Port

- **24 10/100/1000BASE-T** Gigabit RJ45 copper ports with 24-port **IEEE 802.3at/af/Ultra PoE** injector
- **4 100/1000BASE-X mini-GBIC/SFP** slots, shared with port-21 to port-24 compatible with 100BASE-FX SFP
- **4 10GBASE-SR/LR SFP+ slots**, compatible with 1000BASE-SX/LX/BX SFP
- RJ45 console interface for switch basic management and setup

Power over Ethernet

- Complies with IEEE 802.3at Power over Ethernet Plus, end-span/mid-span PSE
- Backward compatible with IEEE 802.3af Power over Ethernet
- Up to 24 ports of IEEE 802.3af/IEEE 802.3at/ultra PoE devices powered
- Supports PoE power up to 75 watts for each ultra PoE port
- Auto detects powered device (PD)
- Circuit protection prevents power interference between ports
- Remote power feeding up to 100 meters
- PoE management

- Total PoE power budget control
- Per port PoE function enable/disable
- PoE admin-mode control
- PoE port power feeding priority
- Per PoE port power limitation
- PD classification detection
- Temperature threshold control
- PD alive check
- PoE schedule

Layer 2 Features

- Prevents packet loss with back pressure (half-duplex) and IEEE 802.3x pause frame flow control (full-duplex)
- High performance of Store-and-Forward architecture and runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Storm Control support
 - Broadcast/Multicast/Unknown unicast
- Supports **VLAN**
 - IEEE 802.1Q tagged VLAN
 - Up to 255 VLANs groups, out of 4094 VLAN IDs
 - Supports provider bridging (VLAN Q-in-Q, IEEE 802.1ad)

- Private VLAN Edge (PVE)



75 Watts of Power over 4-pair UTP

The Switch series ultra PoE solution adopts the IEEE 802.3at/af standard. Instead of delivering power over 2-pair twisted UTP – be it end-span (Pins 1,2,3 and 6) or mid-span (Pins 4,5,7 and 8), it provides the capability to source up to 75 watts of power by using all the four pairs of standard Cat.5e/6 Ethernet cabling. In the new 4-pair system, two PSE controllers will be used to power both the data pairs and the spare pairs. It can offer more PoE applications, such as:

- PoE PTZ speed dome
- Any network device that needs higher PoE power to work normally
- Thin-client
- AIO (All-in-One) touch PC
- Remote digital signage display



- Protocol-based VLAN
- MAC-based VLAN
- Voice VLAN

- Supports Spanning Tree Protocol

- IEEE 802.1D Spanning Tree Protocol
- IEEE 802.1w Rapid Spanning Tree Protocol
- IEEE 802.1s Multiple Spanning Tree Protocol, spanning tree by VLAN
- BPDU Guard

- Supports Link Aggregation

- 802.3ad Link Aggregation Control Protocol (LACP)
- Cisco ether-channel (static trunk)
- Maximum 14 trunk groups, up to 8 ports per trunk group
- Up to 16Gbps bandwidth (full duplex mode)

- Provides port mirror (many-to-1)
- Port mirroring to monitor the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops

Layer 3 Features

- IP interfaces (Max. 8 VLAN interfaces)
- Routing table (Max. 32 routing entries)
- Routing Protocols (IPv4/IPv6 software static routing)

Quality of Service

- Ingress Shaper and Egress Rate Limit per port bandwidth control
- 8 priority queues on all switch ports
- Traffic classification
 - IEEE 802.1p CoS
 - TOS/DSCP/IP precedence of IPv4/IPv6 packets
 - IP TCP/UDP port number
 - Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- Supports QoS and In/Out bandwidth control on each port
- Traffic-policing policies on the switch port
- DSCP remarking

Multicast

- Supports IGMP snooping v1, v2 and v3
- Supports MLD snooping v1 and v2
- Querier mode support
- IGMP snooping port filtering
- MLD snooping port filtering
- Multicast VLAN Registration (MVR) support

Security

- Authentication
 - IEEE 802.1x port-based/MAC-based network access authentication
 - Built-in RADIUS client to cooperate with the RADIUS servers
 - TACACS+ login users access authentication

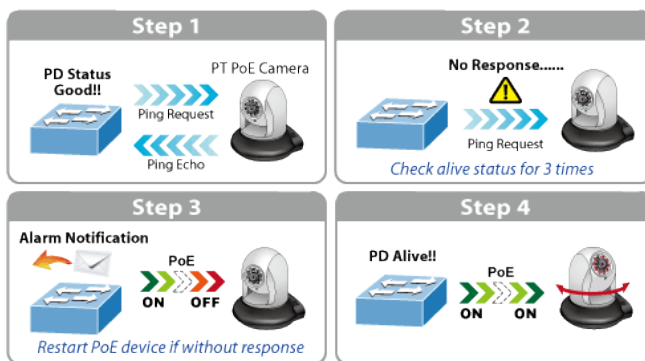
Built-in Unique PoE Functions for Powered Devices Management

As it is the managed PoE switch for surveillance, wireless and VoIP networks, the switch series feature the following special PoE management functions:

- PD alive check
- Scheduled power recycling
- PoE schedule
- PoE usage monitoring

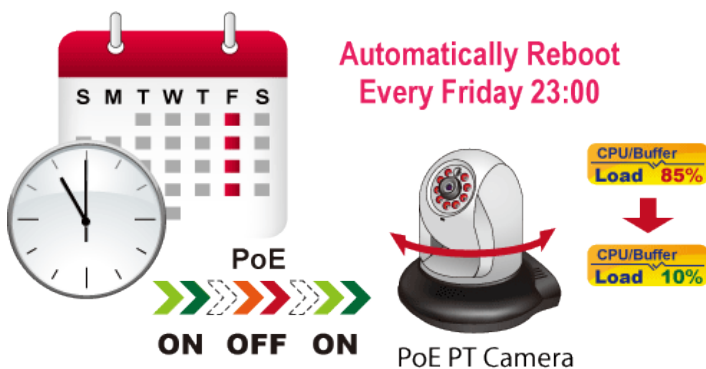
Intelligent Powered Device Alive Check

The Switch series can be configured to monitor connected PD (powered device) status in real time via ping action. Once the PD stops working and responding, the Switch series will resume the PoE port power and bring the PD back to work. It will greatly enhance the network reliability through the PoE port resetting the PD's power source and reducing administrator management burden.



Scheduled Power Recycling

The Switch series allow each of the connected PoE IP cameras or PoE wireless access points to reboot at a specified time each week. Therefore, it will reduce the chance of IP camera or AP crash resulting from buffer overflow.



- RADIUS/TACACS+ users access authentication

- Access Control List

- IP-based Access Control List (ACL)
- MAC-based Access Control List

- Source MAC/IP address binding
- **DHCP Snooping** to filter untrusted DHCP messages
- **Dynamic ARP Inspection** discards ARP packets with invalid MAC address to IP address binding
- **IP Source Guard** prevents IP spoofing attacks
- Auto DoS rule to defend DoS attack
- IP address access management to prevent unauthorized intruder

Management

- IPv4 and IPv6 dual stack management
- Switch Management Interfaces

- Console/Telnet Command Line Interface
- Web switch management
- SNMP v1, v2c, and v3 switch management
- SSH/SSL secure access

- **IPv6** IP Address/NTP/DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- System Maintenance

- Firmware upload/download via HTTP/TFTP
- Reset button for system reboot or reset to factory default
- Dual images

- DHCP Relay
- DHCP Option 82
- User Privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- Network Diagnostic

- ICMPv6/ICMPv4 remote ping
- Cable diagnostic technology provides the mechanism to detect and report potential cabling issues

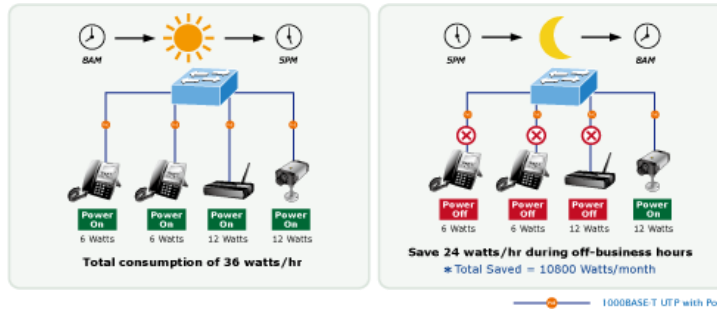
- SMTP/Syslog remote alarm
- Four RMON groups (history, statistics, alarms and events)
- SNMP trap for interface Link Up and Link Down notification
- System Log
- RISK'EXPERT Smart Discovery Utility for deployment management
- Smart fan with speed control

Redundant Power System

- Redundant 100~240V AC/36-60V DC dual power
- Active-active redundant power failure protection
- Backup of catastrophic power failure on one supply
- Fault tolerance and resilience

PoE Schedule for Energy Saving

Under the trend of energy saving worldwide and contributing to environmental protection, the Switch series can effectively control the power supply besides its capability of giving high watts power. The “PoE schedule” function helps you to enable or disable PoE power feeding for each PoE port during specified time intervals and it is a powerful function to help SMBs or Enterprises save power and money. It also increases security by powering off PDs that should not be in use during non-business hours.



PoE Usage Monitoring

Via the power usage chart in the web management interface, the Switch series enable the administrator to monitor the status of the power usage of the connected PDs in real time. Thus, it greatly enhances the management efficiency of the facilities.

Cost-effective 10Gbps Uplink Capacity

10G Ethernet is a big leap in the evolution of Ethernet. The four 10G SFP+ slots of the Switch series support dual-speed 10GBASE-SR/LR or 1000BASE-SX/LX, meaning the administrator now can flexibly choose the suitable SFP/SFP+ transceiver according to the transmission distance or the transmission speed required to extend the network efficiently. They greatly support SMB network to achieve the maximum performance of 10Gbps in a cost-effective way because the 10GbE interface usually could be available in Layer 3 Switch but Layer 3 Switch could be too expensive to SMBs.

Redundant AC/DC Power Supply to Ensure Continuous Operation

The switch series is particularly equipped with one 100–240V AC power supply unit and one 36–60V DC power supply unit to provide an enhanced reliable and scalable redundant power supply. The continuous power system is specifically designed to fulfill the demands of high-tech facilities requiring the highest power integrity. With the 36–60V DC power supply, the redundant switch is able to act as a telecom-level device that can be located in the electronic room.

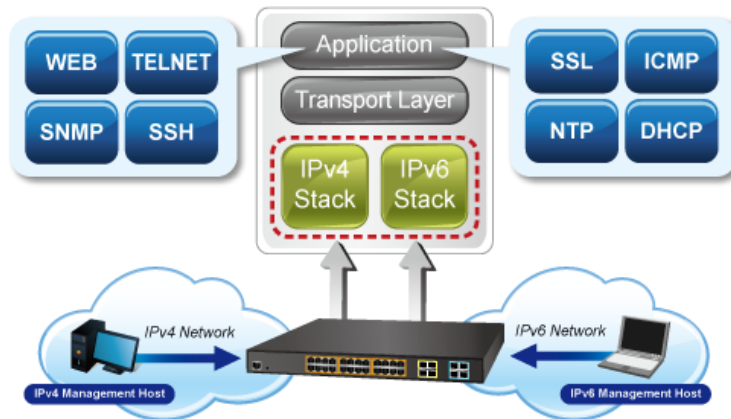


Environment-friendly, Smart Fan Design for Silent Operation

The Switch series feature a desktop-sized metal housing, a low noise design and an effective ventilation system. It supports the smart fan technology that automatically controls the speed of the built-in fan to reduce noise and maintain the temperature of the PoE switch for optimal power output capability. The Switch series are able to operate reliably, stably and quietly in any environment without affecting its performance.

Solution for IPv6 Networking

By supporting IPv6/IPv4 dual stack and plenty of management functions with easy and friendly user interfaces, the switch series are the best choices for IP surveillance, VoIP and wireless service providers to deploy the IPv6 network. It also helps the SMBs to step in the IPv6 era with the lowest investment but not necessary to replace the network facilities while the ISPs construct the IPv6 FTTx edge network.



IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

To help customers stay on top of their businesses, the switch series not only provides ultra high transmission performance and excellent layer 2 technologies, but also offers IPv4/IPv6 VLAN routing feature which allows to cross over different VLANs and different IP addresses for the purpose of having a highly-secure, flexible management and simpler networking application.

Robust Layer 2 Features

The series can be programmed for advanced switch management functions, such as dynamic port link aggregation, Q-in-Q VLAN, Multiple Spanning Tree Protocol (MSTP), Layer 2/4 QoS, bandwidth control and IGMP/MLD snooping. The Sseries allows the operation of a high-speed trunk combining multiple ports. It consists of a maximum of 14 trunk groups with 8 ports for each group, and supports connection fail-over as well.

Powerful Security

The series offers a 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 port number or defined typical network applications. Its protection mechanism also comprises 802.1x Port-based and MAC-based user and device authentication. With the private VLAN function, communication between edge ports can be prevented to ensure user privacy.

Enhanced Security and Traffic Control

The series also provides DHCP Snooping, IP Source Guard and Dynamic ARP Inspection functions to prevent IP snooping from attack and discard ARP packets with invalid MAC address. The network administrator can now construct highly-secure corporate networks with considerably less time and effort than before.

User-friendly Secure Management

For efficient management, the managed switch series is equipped with console, web and SNMP management interfaces. With the built-in web-based management interface, the series offers an easy-to-use, platform independent management and configuration facility. The series supports SNMP and it can be managed via any management software based on the standard SNMP v1 or v2 Protocol. For reducing product learning time, the series offers Cisco-like command via Telnet or console port and customer doesn't need to learn new command from these switches. Moreover, the series offers the remotely secure management by supporting SSH, SSL and SNMP v3 connection where the packet content can be encrypted at each session.

Flexible and Extendable Solution

The 4 mini-GBIC SFP slots built in the Switch series support dual speed as it features 100BASE-FX and 1000BASE-SX/ LX SFP (Small Form-factor Pluggable) fiber-optic modules. Now the administrator can flexibly choose the suitable SFP transceiver according to not only the transmission distance, but also the transmission speed required. The distance can be extended from 550 m to 2 km (multi-mode fiber) and to 10/20/30/40/50/70/120 km (single-mode fiber or WDM fiber). They are well suited for applications within the enterprise data centers and distributions.

Intelligent SFP Diagnosis Mechanism

The Switch series support SFP-DDM (Digital Diagnostic Monitor) function that greatly helps network administrator to easily monitor real-time parameters of the SFP and SFP+ transceivers, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

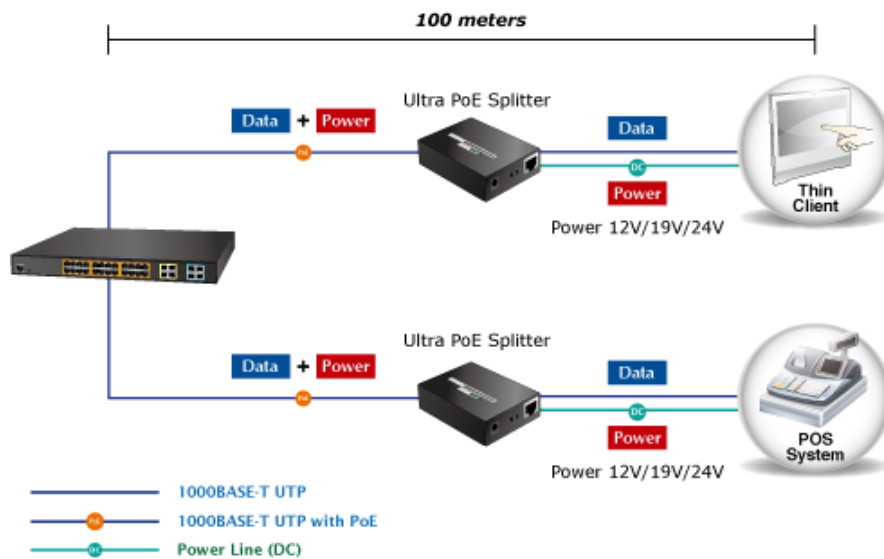
Digital Diagnostic Monitor (DDM)



Applications

Ultra PoE Networking Solution

RISK'EXPERT Switch series can easily build an ultra PoE networking solution on the cyber security system for the enterprises. For instance, it can work with the POS system and thin client to perform comprehensive security protection for today's businesses. The switch series and Ultra PoE Splitter operate as a pair to provide the easiest way to power your Ethernet devices which need high power input. Receiving data and power from the switch series, the Ultra PoE Splitter separates digital data and power into several optional outputs (12V, 19V or 24V DC) to non-PoE devices such as laptops, thin client, POS system, PTZ (Pan, Tilt & Zoom) network cameras, PTZ speed dome, color touch-screen IP phones, multi-channel wireless LAN access points and other network devices at distance up to 100 meters.



Multiple Spanning Tree Protocol with PoE IP Office Solution for SMBs and Workgroups

The Switch series feature strong, rapid self-recovery capability to prevent interruptions and external intrusions. They incorporate Multiple Spanning Tree Protocol (802.1s MSTP) into customer's automation network to enhance system reliability and uptime. Adopting the IEEE 802.3af/ IEEE 802.3at/ Ultra PoE standard, the Switch series can directly connect with any IEEE 802.3at/ultra PoE end-nodes like PTZ (Pan, Tilt & Zoom) network cameras and speed dome cameras. The Switch series can easily help enterprises with the available network infrastructure to build wireless AP, IP camera and VoIP systems where power can be centrally-controlled.





Specifications

Product	Non-redundant	Redundant
Hardware Specifications		
Copper Ports	24 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports	
SFP/mini-GBIC Slots	4 100/1000BASE-X SFP interfaces, shared with Port-21 to Port-24 Compatible with 100BASE-FX SFP transceiver	
SFP+ Slots	4 10GbBASE-SR/LR SFP+ interfaces (Port-25 to Port-28) Compatible with 1000BASE-SX/LX/BX SFP transceiver	
Console	1 x RS232-to-RJ45 serial port (115200, 8, N, 1)	
Switch Architecture	Store-and-Forward	
Switch Fabric	128Gbps/non-blocking	
Throughput	95.23Mpps@64Bytes	
Address Table	16K entries, automatic source address learning and aging	
Shared Data Buffer	32M bits	
Flow Control	IEEE 802.3x pause frame for full-duplex Back pressure for half-duplex	
Jumbo Frame	10K bytes	
Reset Button	< 5 sec: System reboot > 5 sec: Factory default	
Dimensions (W x D x H)	440 x 300 x 44.5 mm, 1U height	
Weight	4551g (non-redundant switch) 4588g (redundant switch)	
LED	System: SYS (Green) AC/PWR (Green) DC (Green) (redundant switch Only) Fan1/2/3 Alert (Red) PoE PWR Alert (Red) PoE Ethernet Interfaces (Port 1 to Port 24): PoE-in-Use (bt-Green) (af/at- Orange) Ethernet Interfaces (Port 1 to Port 24): 1000 LNK/ACT (Green), 10/100 LNK/ACT (Orange) 100/1000Mbps SFP Combo Interfaces (Port 21 to Port 24): 1000 (Green), 100 (Orange) 1/10G SFP+ Interfaces (Port 25 to Port 28): 1000 (Green), 10G (Orange)	
Power Consumption	Max. 446.6 watts/1522.9 BTU	
Power Requirements – AC	AC 100~240V, 50/60Hz, 7A	
Power Requirements – DC	DC 36~60V, 2A	
ESD Protection	6KV DC	
Fan	3 smart fan	
Power over Ethernet		
PoE Standard	IEEE 802.3af/802.3at/802.3bt Ultra PoE PSE	
PoE Power Supply Type	End-span/Mid-span/UPoE	
PoE Power Output	Per port 54V DC, 75 watts (max.)	
Power Pin Assignment	End-span: 1/2(-), 3/6(+) Mid-span: 4/5(+), 7/8(-) UPoE: 1/2(-), 3/6(+), 4/5(+), 7/8(-)	
PoE Power Budget	400 watts (max.)	
PoE Ability PD @ 15 watts	24 units	
PoE Ability PD @ 30 watts	13 units	
PoE Ability PD @ 60 watts	6 units	
Layer 2 Management Functions		
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable	
Port Status	Display each port's speed duplex mode, link status, flow control status, auto-negotiation status, trunk status	
Port Mirroring	TX/RX/Both Many-to-1 monitor	

VLAN	802.1Q tagged based VLAN Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN IP subnet-based VLAN MVR (Multicast VLAN registration) Up to 255 VLAN groups, out of 4095 VLAN IDs	
Link Aggregation	IEEE 802.3ad LACP/static trunk 14 groups with 8 port per trunk	
Spanning Tree Protocol	IEEE 802.1D Spanning Tree Protocol (STP) IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)	
QoS	Traffic classification based, strict priority and WRR 8-level priority for switching: - Port number - 802.1p priority - 802.1Q VLAN tag - DSCP/ToS field in IP packet	
IGMP Snooping	IGMP (v1/v2/v3) snooping, up to 255 multicast groups IGMP querier mode support	
MLD Snooping	MLD (v1/v2) snooping, up to 255 multicast groups MLD querier mode support	
Access Control List	IP-based ACL/MAC-based ACL Up to 256 entries	
Bandwidth Control	Per port bandwidth control Ingress: 100Kbps~1000Mbps Egress: 100Kbps~1000Mbps	
Layer 3 Functions		
IP Interfaces	Max. 8 VLAN interfaces	
Routing Table	Max. 32 routing entries	
Routing Protocols	IPv4 software static routing IPv6 software static routing	
Management		
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c	
Secure Management Interfaces	SSH, SSL, SNMP v3	
SNMP MIBs	RFC 1213 MIB-II RFC 1493 Bridge MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2819 RMON MIB (Groups 1, 2, 3 and 9) RFC 2737 Entity MIB	RFC 2618 RADIUS Client MIB RFC 2863 IF-MIB RFC 2933 IGMP-STD-MIB RFC 3411 SNMP-Frameworks-MIB RFC 4292 IP Forward MIB RFC 4293 IP MIB RFC 4836 MAU-MIB IEEE 802.1X PAE LLDP
Regulatory Compliance	FCC Part 15 Class A, CE	
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000T IEEE 802.3ae 10Gb/s Ethernet IEEE 802.3x flow control and back pressure IEEE 802.3ad port trunk with LACP IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol IEEE 802.1p Class of Service	IEEE 802.1Q VLAN tagging IEEE 802.1x Port Authentication Network Control IEEE 802.1ab LLDP IEEE 802.3af Power over Ethernet IEEE 802.3at Power over Ethernet Plus IEEE 802.3bt 4-pair Power over Ethernet RFC 768 UDP RFC 793 TFTP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP v1 RFC 2236 IGMP v2 RFC 3376 IGMP v3 RFC 2710 MLD v1 RFC 3810 MLD v2
Environment		
Operating	Temperature: 0 ~ 50 degrees C for AC power input Relative Humidity: 5 ~ 95% (non-condensing)	
Storage	Temperature: -40 ~ 80 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	