

This **Long Reach PoE Solution** enables all enterprises and network service providers to set up an IP infrastructure in a remote location where 802.3af/at PoE compliant powered devices can receive both data and power via switches, and LRP extenders and injectors over a long distance but not limited to the normal 100 meters.

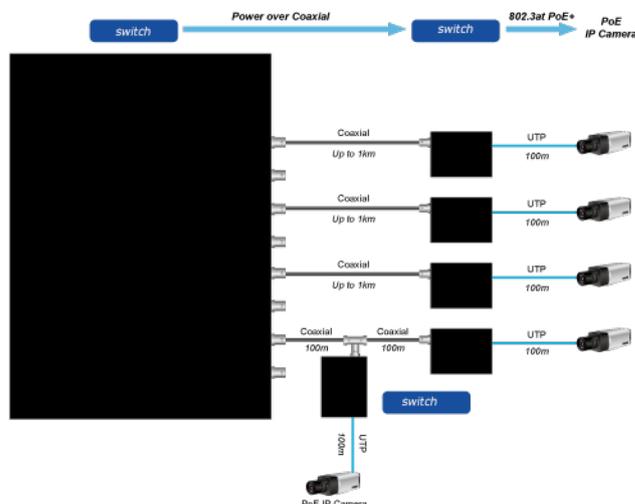
## Intelligent Long Reach PoE Switch on Coaxial-based Network

A brand-new Multi-channel Long Reach PoE Switch, features an extended Ethernet and PoE networking of up to 1,000 meters over the existing coaxial cables going to multiple PoE IP cameras. It provides IPv6 / IPv4 dual stack management and built-in L2/L4 Gigabit Switching engine along with **8 BNC ports** with Long Reach PoE Injector function, **2 Gigabit copper ports** and **2 extra 100/1000BASE-X SFP fiber slots**. Each of the eight BNC ports provides 36 watts of power with a total power budget of up to **240 watts**. As an advanced PoE switch, the switch features **intelligent PoE** functions to improve the availability of critical applications. It provides a quick, safe and cost-effective PoE network solution to upgrading the existing coaxial cable infrastructure from the analog system to the HD IP surveillance system.



## Multi-channel Long Reach Power over Ethernet

To support the enterprises in easily building a multi-channel and centrally-controlled Long Reach PoE system, the SWITCH works with the Long Reach PoE Extenders, via its **8 BNC ports** being the Long Reach PoE injectors for all connected LRP Extenders. Each of the BNC port features long range data and power transmission for distance up to **1,000m (3,280ft)** over **coaxial cable** to the LRP Extender, and another **100m** over **Ethernet cable** to remote PoE IP camera, PoE wireless AP or access control systems complied with **802.3af/at PoE**.



## Centralized Power Management

With the centrally-managed 240-watt PoE budget, the SWITCH eliminates the need for an additional remote site power while allowing a single power source to provide power to both LRP extenders and the PoE powered devices at long range. The Long Reach PoE capabilities provided help to reduce installation time and deployment costs for network devices as a result of freeing from restrictions of power outlet locations.

## Daisy-chaining Multiple Nodes

This Long Reach PoE solution can easily build a power system for centrally-controlled IP cameras in a high availability network infrastructure. It gives users the flexibility to expand small area network with **BNC T-connector** for sharing **four nodes** per port when needed, making the SWITCH with 8 BNC Long Reach PoE Ports an ideal support for up to 32 IP cameras.

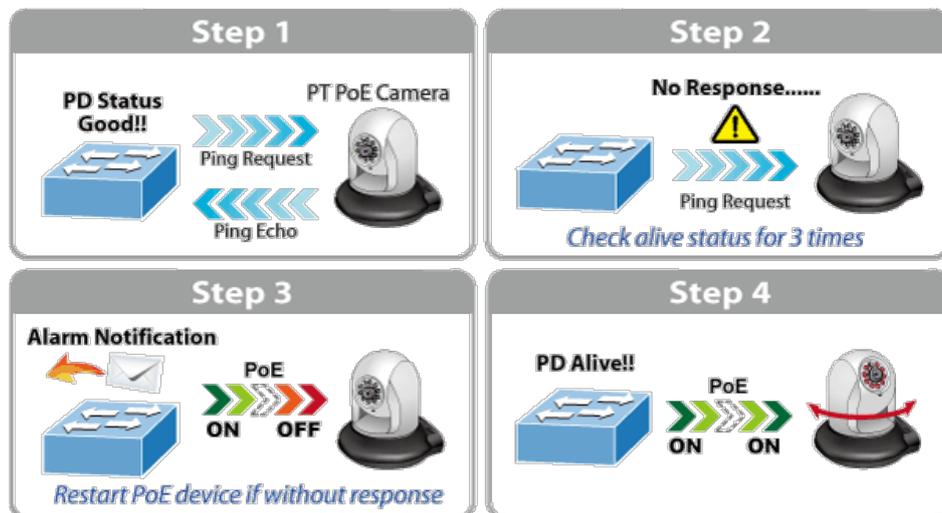
## Built-in Unique PoE Functions for Powered Devices Management

As a managed PoE switch for surveillance, wireless and VoIP networks, the SWITCH particularly features the following special PoE Management functions to accomplish a highly-efficient Long Reach network:

- PD Alive Check
- Scheduled Power Recycling
- PoE Schedule
- PoE Usage Monitoring

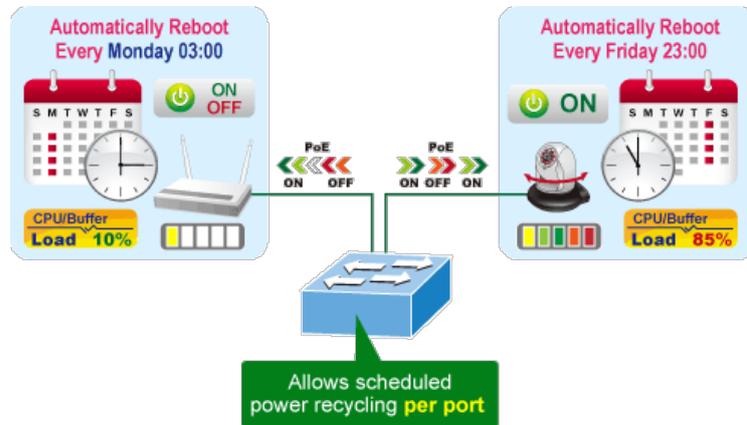
## Intelligent Powered Device Alive Check

The SWITCH 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 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.



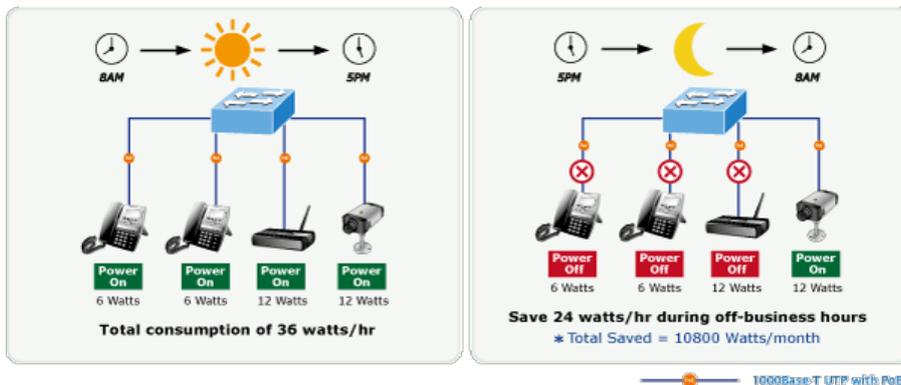
### Scheduled Power Recycling

The SWITCH allows each of the connected PoE IP cameras or PoE wireless access points via the extender to reboot at a specific time each week. Therefore, it will reduce the chance of IP camera or wireless AP crash resulting from buffer overflow.



### PoE Schedule for Energy Saving

Under the trend of energy saving worldwide and contributing to environmental protection, the SWITCH 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 enables 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.

### PoE Over-temperature Protection System

The **over-temperature protection** of the SWITCH offers a safe and stable PoE operation by limiting the output power in order to avoid destructive breakdown due to unexpected overheating.

### Environment-friendly, Smart Fan Design for Silent Operation

The SWITCH features a 19-inch metal housing, a low noise design and an effective ventilation system. It supports the smart fan technology to automatically control 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 is able to operate reliably, stably and quietly in any environment without affecting its performance.



63, rue de Hollerich  
L 1741 Luxembourg  
www.riskexpert.lu  
Tél . : +352 26 19 02 74

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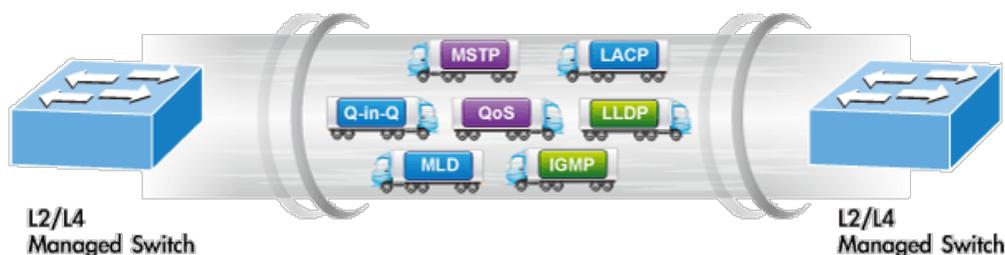
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## IPv6 / IPv4 Dual Stack

Supporting both IPv6 and IPv4 protocols, the SWITCH helps the SMBs to step in the IPv6 era with the lowest investment as its network facilities need not be replaced or overhauled if the IPv6 FTTx edge network is set up.

## Robust Layer 2 Features

The SWITCH can be programmed for advanced switch management functions such as dynamic port link aggregation, 802.1Q VLAN and **Q-in-Q VLAN**, **Multiple Spanning Tree Protocol (MSTP)**, Loop and **BPDU Guard**, **IGMP Snooping**, and **MLD Snooping**. Via the link aggregation, the SWITCH allows the operation of a high-speed trunk to combine with multiple ports such as an 8Gbps fat pipe, and supports fail-over as well. Also, the Link Layer Discovery Protocol (LLDP) is the Layer 2 Protocol included to help discover basic information about neighboring devices on the local broadcast domain.



## Efficient Traffic Control

The switch is loaded with robust QoS features and powerful traffic management to enhance services to business-class data, voice, and video solutions. The functionality includes broadcast / multicast **storm control**, per port **bandwidth control**, IP DSCP QoS priority and remarking. It guarantees the best performance for VoIP and video stream transmission, and empowers the enterprises to take full advantage of the limited network resources.

## Powerful Security

The switch offers comprehensive **IPv4 / IPv6** 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** user and device authentication, which can be deployed with RADIUS to ensure the port level security and block illegal users. With the **Protected Port** function, communication between edge ports can be prevented to guarantee user privacy. Furthermore, **Port Security** function allows to limit the number of network devices on a given port.

## Advanced Network Security

The SWITCH 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 administrators can now build highly-secured corporate networks with considerably less time and effort than before.

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### Friendly and Secure Management

For efficient management, the SWITCH is equipped with console, **Web**, **Telnet** and **SNMP** management interfaces. With the built-in Web-based management interface, the SWITCH offers an easy-to-use, platform-independent management and configuration facility. By supporting the standard Simple Network Management Protocol (SNMP), the switch can be managed via any standard management software. For text-based management, the switch can be accessed via Telnet and the console port. Moreover, the SWITCH offers secure remote management by supporting **SSH**, **SSL** and **SNMP v3** connections which encrypt the packet content at each session.

### Flexibility and Long-distance Extension Solution

The SWITCH provides two Gigabit TP interfaces supporting 10/100/1000BASE-T RJ45 copper to be connected with surveillance network devices such as NVR, Video Streaming Server or NAS to facilitate surveillance management. Or through another two **dual-speed fiber SFP slots**, it can connect with the **100BASE-FX / 1000BASE-SX/LX SFP** (Small Form-factor Pluggable) fiber transceiver to uplink to backbone switch and monitoring center in long distance. The distance can be extended from 550 meters to 2 kilometers (multi-mode fiber) and up to 10/20/30/40/50/70/120 kilometers (single-mode fiber or WDM fiber). The SWITCH is well suited for applications within the enterprise data centers and distributions.

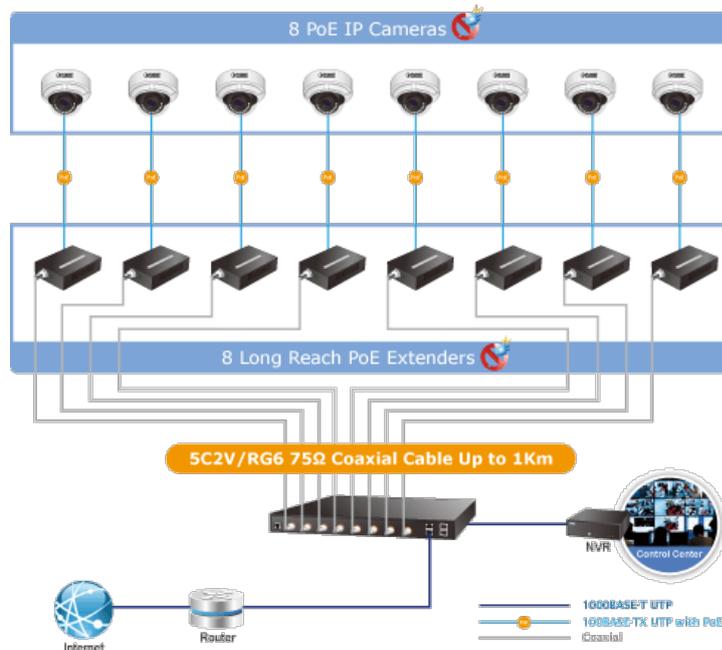
### Intelligent SFP Diagnosis Mechanism

The SWITCH also supports **SFP-DDM (Digital Diagnostic Monitor)** function that can easily monitor real-time parameters of the SFP for network administrator, such as optical output power, optical input power, temperature, laser bias current and transceiver supply voltage.

## Application

### Long Reach PoE IP Surveillance Solution

The SWITCH provides robust Long Reach PoE features to prevent network interruptions and extend the transmission of data and power via coaxial cable for up to 1km by working with the Long Reach Extender. It incorporates new **Long Reach PoE** technology into customer's IP surveillance network to increase the distance of system transmission but to decrease the cost of installation. Applying the Long Reach Power over Ethernet functions in the switch, the extender can directly connect with any IEEE 802.3at/af end-nodes like IP cameras. Furthermore, the power management of the IP camera system can be centrally controlled via the switch.



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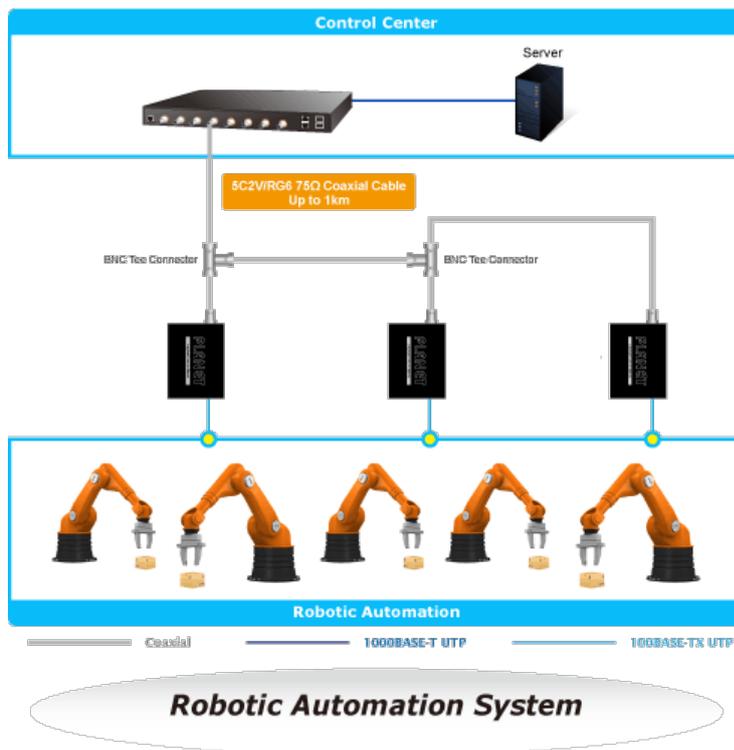
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### Highly-scalable Solution for Robotic Automation System

The SWITCH brings network infrastructure higher flexibility but lower in cost. Providing eight Fast Ethernet Long Reach PoE coaxial ports, two Gigabit TP ports and two Gigabit SFP slots, the SWITCH can easily build a Long Reach Ethernet (LRE) networking area consisting of **1km coaxial cable** on the robotic automation system for the factory. Obviously, the Long Reach PoE system gives you the flexibility to expand small area network with **BNC Tee Connector** for sharing four nodes per port when needed.



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## Specifications

Hardware Specifications																																	
<b>Ethernet Interfaces</b>	<ul style="list-style-type: none"> <li>■ Copper:                             <ul style="list-style-type: none"> <li>• 2 x 10/100/1000BASE-T RJ45</li> <li>• Auto-negotiation/ Auto-MDI/MDI-X</li> </ul> </li> <li>■ Fiber Optic:                             <ul style="list-style-type: none"> <li>• 2 x 100/1000BASE-X SFP slot</li> <li>• Supports 100/1000Mbps dual mode and DDM</li> </ul> </li> <li>■ Jumbo Frame:                             <ul style="list-style-type: none"> <li>• 10Kbytes with GE1 to GE4</li> </ul> </li> </ul>																																
<b>Long Reach PoE Interfaces</b>	<ul style="list-style-type: none"> <li>■ Connectivity:                             <ul style="list-style-type: none"> <li>• 8 x BNC female connectors</li> </ul>                             Long Reach PoE over coaxial PSE (Power Source Equipment)                             <ul style="list-style-type: none"> <li>- BNC center pole : DC+ / Hi</li> <li>- BNC shield : DC - / Lo</li> </ul> </li> <li>■ Power Output:                             <ul style="list-style-type: none"> <li>• Per port 54V DC, 36 watts max.</li> </ul> </li> <li>■ Total Power Budget:                             <ul style="list-style-type: none"> <li>• 240 watts (max.) @ 25 degrees C</li> <li>• 200 watts (max.) @ 50 degrees C</li> </ul> </li> <li>■ Cabling:                             <ul style="list-style-type: none"> <li>• Coaxial cable: 75 ohm</li> <li>• RG-6/U cable (Recommended)</li> </ul> </li> <li>■ Maximum Distance:                             <ul style="list-style-type: none"> <li>• Max. 200m with PoE+ output (1,640ft.)</li> <li>• Max. 400m with PoE output (2,624ft.)</li> <li>• Max. 1200m without PoE output (3,937ft.)</li> </ul> </li> <li>■ Long Reach Ethernet Standard:                             <ul style="list-style-type: none"> <li>• IEEE 1901</li> </ul> </li> <li>■ Modulation Type:                             <ul style="list-style-type: none"> <li>• Wavelet-OFDM</li> </ul> </li> <li>■ Security:                             <ul style="list-style-type: none"> <li>• 128-bit AES encryption</li> </ul> </li> <li>■ Frequency Band:                             <ul style="list-style-type: none"> <li>• 2 ~ 28MHz</li> </ul> </li> <li>■ Performance:</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">RG-6/U Distance</th> <th colspan="2">Data Rate*</th> <th rowspan="2">LRP-101CE PoE Output@25 degrees C*</th> </tr> <tr> <th>TX**</th> <th>RX**</th> </tr> </thead> <tbody> <tr> <td>200m</td> <td>93.2Mbps</td> <td>92.0Mbps</td> <td>22.9W</td> </tr> <tr> <td>400m</td> <td>82.4Mbps</td> <td>73.6Mbps</td> <td>18.7W</td> </tr> <tr> <td>600m</td> <td>77.2Mbps</td> <td>62.3Mbps</td> <td>15.0W</td> </tr> <tr> <td>800m</td> <td>60.2Mbps</td> <td>54.3Mbps</td> <td>10.4W</td> </tr> <tr> <td>1000m</td> <td>38.1Mbps</td> <td>38.1Mbps</td> <td>7.8W</td> </tr> <tr> <td>1200m</td> <td>25.6Mbps</td> <td>25.0Mbps</td> <td>---</td> </tr> </tbody> </table>			RG-6/U Distance	Data Rate*		LRP-101CE PoE Output@25 degrees C*	TX**	RX**	200m	93.2Mbps	92.0Mbps	22.9W	400m	82.4Mbps	73.6Mbps	18.7W	600m	77.2Mbps	62.3Mbps	15.0W	800m	60.2Mbps	54.3Mbps	10.4W	1000m	38.1Mbps	38.1Mbps	7.8W	1200m	25.6Mbps	25.0Mbps	---
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	<p>* The actual data rate and PoE output vary on the quality of the copper wire and environmental factors. The performance result above is based on the testing via the RG-6/U coaxial cable.</p> <p>■ Multiple Nodes: Up to 4 LRP extenders within 1km RG-6/U coaxial cable*</p> <p>* The actual extender nodes vary on the quality of the copper wire and environmental factors.</p> <p>■ LRP Compatibility: LRP-101CE: 1-Port 10/100TX PoE PSE + 1-Port Coax Long Reach PoE Extender</p>
<b>Console</b>	1 x RS232-to-RJ45 serial port (115200, 8, N, 1)
<b>Switch Architecture</b>	Store-and-Forward
<b>Switch Fabric</b>	9.6Gbps / non-blocking
<b>Address Table</b>	8K entries
<b>Shared Data Buffer</b>	4.1 megabits
<b>Flow Control</b>	IEEE 802.3x pause frame for full-duplex Back pressure for half-duplex
<b>Reset Button</b>	< 5 sec: System reboot > 5 sec: Factory default
<b>LED</b>	PWR, SYS, LNK, PoE-in-Use, 1000, LNK/ACK, Fan 1 Alert, Fan 2 Alert, PoE PWR Alert
<b>Dimensions (W x D x H)</b>	440 x 300 x 44.5 mm, 1U height
<b>Weight</b>	3878g
<b>Power Requirements</b>	AC 100~240V, 50/60Hz, auto-sensing
<b>ESD Protection</b>	6KV DC
<b>Power Consumption</b>	320 watts / 1091.8 BTU
<b>Enclosure</b>	Metal
<b>Layer 2 Functions</b>	
<b>Port Mirroring</b>	TX / RX / both Many-to-1 monitor
<b>VLAN</b>	802.1Q tagged-based VLAN Up to 256 VLAN groups, out of 4094 VLAN IDs 802.1ad Q-in-Q tunneling Voice VLAN Protocol VLAN Private VLAN (Protected port)



	GVRP
<b>Link Aggregation</b>	IEEE 802.3ad LACP and static trunk Supports 4 groups of 4-port trunk
<b>Spanning Tree Protocol</b>	STP / RSTP / MSTP
<b>IGMP Snooping</b>	IGMP (v2/v3) Snooping IGMP Querier Up to 256 multicast groups
<b>MLD Snooping</b>	MLD (v1/v2) Snooping, up to 256 multicast groups
<b>Access Control List</b>	IPv4/IPv6 IP-based ACL / MAC-based ACL
<b>QoS</b>	8 mapping ID to 8 level priority queues - Port number - 802.1p priority - 802.1Q VLAN tag - DSCP field in IP packet Traffic classification based, strict priority and WRR
<b>Security</b>	IEEE 802.1X – Port-based authentication Built-in RADIUS client to co-operate with RADIUS server RADIUS / TACACS+ user access authentication IP-MAC port binding MAC filter Static MAC address DHCP Snooping and DHCP Option82 STP BPDU guard, BPDU filtering and BPDU forwarding DoS attack prevention ARP inspection IP source guard
<b>Management Functions</b>	
<b>Basic Management Interfaces</b>	Web browser / Telnet / SNMP v1, v2c Firmware upgrade by HTTP / TFTP protocol through Ethernet network Remote / Local Syslog System log LLDP protocol SNTP
<b>Secure Management Interfaces</b>	SSH, SSL, SNMP v3
<b>SNMP MIBs</b>	RFC 1213 MIB-II RFC 1215 Generic Traps RFC 1493 Bridge MIB RFC 2674 Bridge MIB Extensions RFC 2737 Entity MIB (Version 2) RFC 2819 RMON (1, 2, 3, 9) RFC 2863 Interface Group MIB RFC 3635 Ethernet-like MIB
<b>Standards Conformance</b>	



<b>Regulation Compliance</b>	FCC Part 15 Class A, CE
<b>Standards Compliance</b>	IEEE 1901 Broadband Power Line IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000T IEEE 802.3x 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 RFC 768 UDP RFC 793 TFTP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP version 1 RFC 2236 IGMP version 2 RFC 3376 IGMP version 3 RFC 2710 MLD version 1 RFC 3810 MLD version 2
<b>Environment</b>	
<b>Operating</b>	Temperature: 0 ~ 50 degrees C Relative Humidity: 5 ~ 95% (non-condensing)
<b>Storage</b>	Temperature: -10 ~ 70 degrees C Relative Humidity: 5 ~ 95% (non-condensing)

