

## PT-2960 Series

### Overview

The PT-2960 series is a new-generation intelligent L2 Ethernet switch designed by Opzoon to offer high performance, comprehensive access control policies, security features, and great reliability for building highly secure networks.

The PT-2960 series can act as an access switch for demands of high-security requirements like e-government and enterprise networks. This series provides hardware support for IPv4/IPv6 switching and Opzoon unique expansion features to meet the requirements of the coming IPv6 era.



### Product Highlights

#### Performance

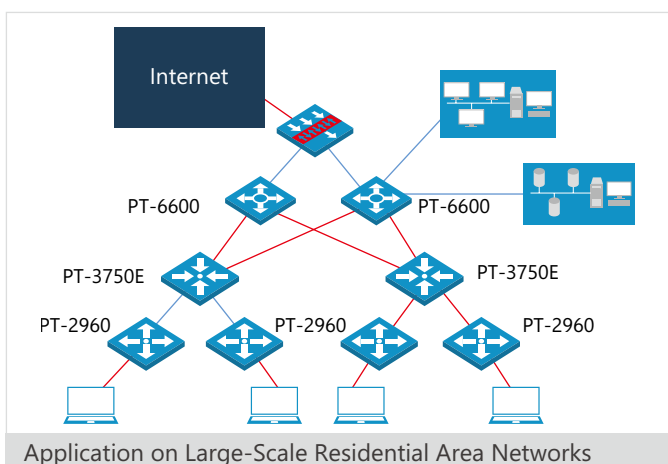
- Up to 17.6Gbps throughput
- Up to 13.1Mpps forwarding
- Support High port density for 1GbE
- Wire-speed L2/L3 forwarding

### Support IPv6 Features

The PT-2960 series provides hardware support for IPv4/IPv6 switching at line rate and supports various IPv6 functions including basic IPv6 host features, IPv6 ACL, QoS, DHCPv6, MLD Snooping, IPv6 Multicast VLAN, sFlow ...etc., and various security technologies to guarantee the reliability.

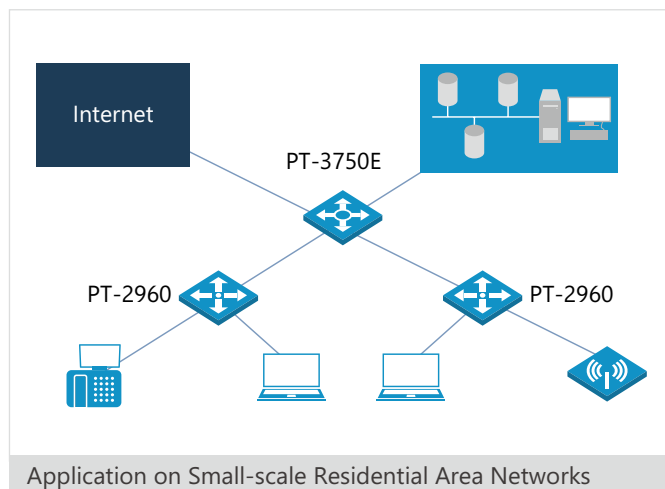
### Multi-service Capability

The PT-2960 series supports flexible Q-in-Q function expanding VLAN range to realize the agile packets forwarded by different services, users, priorities, and traffic flows.



### High Reliability

The PT-2960 series supports STP, RSTP, MSTP and Smart Link to ensure rapid convergence and network stability. Moreover, the PT-2960 series supports Fast Ethernet ring network protection and UDLD to keep the communication continuous and reliable ensuring network stability.



### Enhanced Security Protection

The PT-2960 series supports complete ARP intrusion detection and anti-spoofing attack functions, such as ARP-scan, ARP guard, ARP/Port binding, ARP rate-limiting, and DHCP Snooping binding ARP...etc.. All these effectively prevent lots kind of ARP packet attacks. It also provides multiple features of effective authentication by MAC security and extensive packet filtering from L2 to L7 by hardware ACL to protect the network and become more secure and stable.

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### Efficient IEEE802.1x for AAA Solution

The PT-2960 series provides standard and proprietary 802.1x features for the customer who requires AAA (Authentication, Authorization, Accounting) solution to accomplish the user account control. Unauthorized user can be blocked by Port, MAC, traffic flow, and specific time; moreover, to reduce management overhead, the supports of Anti-BT, IP Conflict Prevention, Trust View, Free Resource, Auto VLAN, and Guest VLAN features provide secured and flexible way of user identification regardless of networks which customers connect to.

### Guarantee for Major Services

For the customers who operate the network services running a variety of applications with critical traffics, the PT-2960 switch provides comprehensive QoS mechanisms to guarantee those critical traffics can be transmitted with high priority, sufficient bandwidth, and controllable latency. Meanwhile, the guaranteeing critical traffics do not cause other traffics fail. The PT-2960 supports QoS features including:

- Up to 4 queues per port
- 802.1p based classification
- DSCP based classification and remarking
- QoS interface trust (COS / DSCP)
- Strict priority queuing
- Deficit Weighted Round Robin (DWRR) Scheduling
- ACL based DSCP Marking
- ACL based Policing
- Policing/Shaping
- Rate limiting

### High-performance Power Supply Capacity

The PT-2960 series has the "P" Model that supports Power over Ethernet(PoE) feature for providing DC power through

Ethernet connection to PDs (Powered Device)such as IP Phone, IP camera, and wireless AP. The power supply system can reduce the power cable layout and maintenance cost for PDs.

The PT-2960 supports the IEEE802.3af power-supply standards which is compatible with the non-standard PDs.The series supports the PD detection function to discover standard or non-standard PDs.

### Simple and Convenient Management

With plenty of secure management functions, the PT-2960 series can be easily managed through SNMPv1/v2/v3, WEB, SSH, Syslog, TELNET, and SHELL to complete the configuration, management, access, and monitoring by different levels of administrators for system operation to avoid the risk of unauthorized reconfiguration by non-trusted users.

### Ideal Design for Efficient IT architecture

The PT-2960 series adopts the leading processor to increase efficiency and utility; the intelligent power supplies and fans provide not only real-time monitoring and dynamic alert but also automatic adjustment to reach the concept of energy efficiency.

### Standards Compliance

- 802.1D Bridging and Spanning Tree
- 802.1p QoS/COS
- 802.1Q VLAN Tagging
- 802.1w Rapid Spanning Tree
- 802.1s Multiple Spanning Tree Protocol
- 802.1AB Link Layer Discovery Protocol
- 802.3 10BASE-T Ethernet
- 802.3u 100BASE-TX Fast Ethernet
- 802.3ab 1000BASE-T Gigabit Ethernet
- 802.3z 1000BASE-X Gigabit Ethernet

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- 802.3ad Link Aggregation (LACP)
- 802.3x Flow control
- RFC 2460 IPv6
- RFC 2461 Neighbor Discovery for IP Version 6 (IPv6)
- RFC 2462 IPv6 Stateless Address Autoconfiguration
- RFC 2463 Internet Control Message Protocol (ICMPv6)

## SNMP MIBs

- RFC 783 TFTP
- RFC 854 Telnet
- RFC 1156 TCP/IP-MIB
- RFC 1157 SNMPv1
- RFC 1212 MIB definitions
- RFC 1213 SNMP MIB II
- RFC 1493 BRIDGE-MIB
- RFC 1650 EtherLike-MIB
- RFC 1757 RMON MIB
- RFC 1907 SNMPv2-MIB
- RFC 2021 RMON2 probes
- RFC 2037 ENTITY-MIB
- RFC 2096 IP-FORWARD-MIB
- RFC 2233 IF-MIB
- RFC 2466 MIB for IPv6: ICMPv6 Group
- RFC 2674 Q-BRIDGE-MIB
- LLDP-MIB
- LLDP-EXT-DOT1-MIB
- LLDP-EXT-DOT3-MIB

### Specifications

Product	PT-2960-10T	PT-2960-26T	PT-2960-52T	PT-2960-26P	PT-2960-50P
Ports	8 x 10/100 BASE-T ports, 2 x GbE Combo ports, 1 RJ45 console port	24 x 10/100 BASE-T ports, 2 x GbE Combo ports,1 RJ45 console port	48 x 10/100 BASE-T ports, 4 x GbE Combo ports, 1 RJ45 console port	24 x 10/100 BASE-T (PoE) ports, 2 x GbE Combo ports, 1 RJ45 console port	48 x 10/100 BASE-T (PoE) ports, 2 x GbE Combo ports, 1 RJ45 console port
Switching Capacity	5.6Gbps	8.8Gbps	17.6Gbps	8.8Gbps	13.6Gbps
Package Forwarding Rate	4.2Mpps	6.5Mpps	13.1Mpps	6.5Mpps	10.1Mpps
PoE	/	/	/	802.3af standard (max 15.4w)	802.3af standard (max 15.4w)
Jumbo frame	10KB	10KB	10KB	10KB	10KB
<b>Hardware configuration</b>					
Dimension(W*H*D mm)	330*43.4*200	440*43.4*250	440*43.4*250	440*43.4*318	440*43.4*396
Working Humidity	5%~95% Non-condensing	5%~95% Non-condensing	5%~95% Non-condensing	5%~95% Non-condensing	5%~95% Non-condensing
Working Temperature	0°C~50°C	0°C~50°C	0°C~50°C	0°C~50°C	0°C~50°C
Storage Temperature	-40°C~70°C	-40°C~70°C	-40°C~70°C	-40°C~70°C	-40°C~70°C
Power Supply	AC:100-240V, 50-60 Hz	AC:100-240V, 50-60 Hz	AC:100-240V, 50-60 Hz	AC:100-240V, 50-60 Hz	AC:100-240V, 50-60 Hz
Power Consumption	≤13W	15W	≤65W	≤240W(PoE)	≤501W(PoE)

#### Layer 2 feature

VLAN	<ul style="list-style-type: none"> <li>• Up to 4096 VLANs</li> <li>• Support Protocol based VLAN</li> <li>• Support basic QinQ</li> <li>• Support port isolation</li> <li>• Support GVRP</li> </ul>
MAC Address Table	<ul style="list-style-type: none"> <li>• Up to 16K(8K for PT-2960-10T) unicast MAC addresses</li> <li>• Up to 1023(256 for PT-2960-10T) multicast MAC address</li> <li>• Support black hole MAC addresses                             <ul style="list-style-type: none"> <li>- Source address based MAC filter</li> <li>- Destination address based MAC filter</li> </ul> </li> <li>• Supports dynamic MAC management</li> <li>• Support MAC-binding based on source MAC addresses.</li> <li>• Support MAC quantity control                             <ul style="list-style-type: none"> <li>- Port based MAC quantity control</li> </ul> </li> </ul>

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Reliability	<ul style="list-style-type: none"><li>• Support IEEE 802.1d Spanning Tree Protocol (STP)</li><li>• Support IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)</li><li>• Support IEEE 802.1s Multiple Spanning Tree Protocol instances (MSTP)</li><li>• Support STP Root Guard</li><li>• Support BPDU Guard</li><li>• Support BPDU transparent transmission</li><li>• Support Smart Link/Monitor Link</li><li>• Support Fast Ethernet ring network protection</li></ul>
Port Mirroring	<ul style="list-style-type: none"><li>• Support one-to-one mirroring</li><li>• Support many-to-one mirroring</li><li>• Support flow-based mirroring</li><li>• Support RSPAN</li></ul>
Flow control	<ul style="list-style-type: none"><li>• Support IEEE802.3x flow control and back pressure</li><li>• Support Storm control</li></ul>
Link aggregation	<ul style="list-style-type: none"><li>• Support LACP(802.3ad)<ul style="list-style-type: none"><li>- 8 ports</li><li>- 32groups per system</li></ul></li><li>• Support Static link aggregation</li></ul>
<b>Layer 3 feature</b>	
IPv4	<ul style="list-style-type: none"><li>• Support ARP<ul style="list-style-type: none"><li>- ARP basic function and static ARP</li><li>- Anti ARP packet attack</li><li>- ARP re-certification</li><li>- ARP and L2 port binding, ARP binding</li><li>- Anti ARP scan</li><li>- ARP guard</li><li>- Gratuitous ARP</li></ul></li><li>• Support ICMP<ul style="list-style-type: none"><li>- ICMP basic function</li></ul></li><li>• Support Default gateway</li><li>• Support Anti IP packet DOS attack</li><li>• Support CIDR</li></ul>
IPv6	<ul style="list-style-type: none"><li>• Support IPv4/IPv6 Dual Protocol Stack</li><li>• Support ICMPv6, ND,ND SNOOPING</li></ul>

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DHCP	<ul style="list-style-type: none"><li>• Support DHCPv4<ul style="list-style-type: none"><li>- DHCP Server</li><li>- DHCP Client/BOOTP</li><li>- DHCP Relay / DHCP Relay option 82</li><li>- DHCP Snooping<ul style="list-style-type: none"><li>&gt; Support binding user IP and MAC / prevent illegal DHCP server / DHCP packets dos attack prevention / DHCP snooping option82</li></ul></li></ul></li><li>• Support DHCPv6<ul style="list-style-type: none"><li>- DHCPv6 Server</li><li>- DHCPv6 Client</li><li>- DHCPv6 Relay /DHCPv6 Relay option37/38</li><li>- DHCPv6 Snooping<ul style="list-style-type: none"><li>&gt; Support binding user IP and MAC / prevent illegal DHCP server / DHCP packets dos attack prevention</li></ul></li></ul></li></ul>
Multicast	
Multicast	<ul style="list-style-type: none"><li>• Support IGMP snooping v1/v2/v3</li><li>• Support IGMP Fast leave(v2v3)</li><li>• Support MLD snooping v1/v2</li><li>• Support Multicast VLAN and Controlled Multicast for IPv4 and IPv6</li></ul>
Security	
Security / Authentication	<ul style="list-style-type: none"><li>• Support IP source guard</li><li>• Support 802.1x<ul style="list-style-type: none"><li>- Support dot1x packet Transparent Transmission (pass through)</li><li>- Support port based, MAC based and based on user (Port,MAC) authentication</li><li>- Support EAP ( TLS, PEAP, MD5 )</li><li>- Support windows XP standard dot1x CPE</li><li>- Support guest VLAN and auto VLAN</li><li>- Support time-based or traffic-base billing</li></ul></li><li>• Support TACACS+</li><li>• Support RADIUS</li></ul>
Protection	<ul style="list-style-type: none"><li>• CPU protection</li><li>• Software watchdog<ul style="list-style-type: none"><li>- Support tasks anomaly detection / memory error detection / CPU utilization monitoring / stack anomaly detection / uplink port up / down monitoring</li></ul></li><li>• Hardware watchdog<ul style="list-style-type: none"><li>- After the complete collapse of the software or the CPU status is abnormal, the hardware watchdog will automatically reset.</li></ul></li></ul>

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ACL	<ul style="list-style-type: none"><li>- Support standard and extended ACL</li><li>- Support dynamic ACL</li><li>- Support IPv6 ACL</li></ul>
<hr/> <b>Management/ Maintenance</b> <hr/>	
Management	<ul style="list-style-type: none"><li>• Support image upgrading through FTP, TFTP<ul style="list-style-type: none"><li>- Support TFTP/FTP server</li><li>- Support TFTP/FTP client</li></ul></li><li>• Support System configuration with<ul style="list-style-type: none"><li>- WEB (HTTP,HTTPs and SSL)</li><li>- SNMP v1/v2c /v3</li><li>- CLI by console port, Telnet and SSH</li></ul></li><li>• Support standard centralized network management software</li><li>• Support OPManager basic network infrastructure management suite.</li><li>• Support SNMP and NTP</li></ul>
Maintenance	<ul style="list-style-type: none"><li>• Support RMON (Remote Monitoring) v1/v2/v3/v9 groups of MIBs</li><li>• Support Syslog</li><li>• Support Virtual Cable Test(VCT)</li><li>• Support LLDP</li><li>• Support UDLD</li><li>• Support port loop detection</li><li>• Support sFlow for IPv4 and IPv6</li><li>• Support network diagnose<ul style="list-style-type: none"><li>- Ping</li><li>- Traceroute</li></ul></li></ul>
<hr/> <b>Quality of Service (QoS)</b> <hr/>	
QoS	<ul style="list-style-type: none"><li>• Up to 4 queues per port</li><li>• Support Queue scheduling algorithms including SP(Strict Priority), DWRR(Deficit Weighted Round Robin)</li><li>• Support 802.1p, DiffServ for traffic classification</li><li>• Support the use of ACL for traffic classification</li><li>• Support Traffic Shaping</li><li>• Support priority Mark / Remark</li></ul>

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### Ordering Information

Model Name	Description
PT-2960-10T	version 2 , Manageable L2 Switch , 8-Port 10/100BASE-TX+2 Combo Gigabit Port(RJ-45/SFP)
PT-2960-26T	version 2 , Manageable L2 Switch , 24-Port 10/100BASE-TX+2 Combo Gigabit Port(RJ-45/SFP)
PT-2960-52T	version 2 , Manageable L2 Switch , 48-Port 10/100BASE-TX+4 Combo Gigabit Port(RJ-45/SFP)
PT-2960-26P	version 2 , Manageable L2 Switch , 24-Port 10/100BASE-TX POE(802.3af)+2 Combo Gigabit Port(RJ-45/SFP)
PT-2960-50P	version 2 , Manageable L2 Switch , 48-Port 10/100Base-TX POE(802.3af)+2 Combo Gigabit Port(RJ-45/SFP)
SFP-SX	1000BASE-SX SFP Transceiver(850nm,MMF,550m), LC Connector
SFP-LX	1000BASE-LX SFP Transceiver(1310nm,SMF,10km or MMF,550m), LC Connector
SFP-LX-20	1000BASE-LX SFP Transceiver(1310nm,SMF,20km),LC Connector
SFP-LX-40	1000BASE-LX SFP Transceiver(1310nm,SMF,40km),LC Connector
SFP-LX-80	1000BASE-LX SFP Transceiver(1550nm,SMF,80km),LC Connector
SFP-GT	1000BASE-T SFP Transceiver,RJ-45 Connector

#### Beijing Headquarters

10-11th floor, Tower B, Yintai Center, 2 Jianguomenwai St., Beijing, China 100022

#### Taipei Global Office

6F.-5, No.408, Ruiguang Rd., Neihu Dist., Taipei City 114, Taiwan  
+886-2-7736-9808

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[www.opzoon.com](http://www.opzoon.com)

#### Support

[global.support@opzoon.com](mailto:global.support@opzoon.com)

#### Sales

[global.sales@opzoon.com](mailto:global.sales@opzoon.com)

#### Version

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