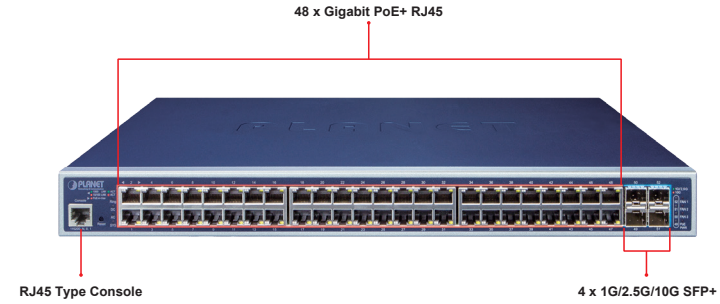
GS-5220-48P4X
GS-5220-48PL4XR

L3 48-Port 10/100/1000T 802.3at PoE + 4-Port 10G SFP+ Managed Switch

IPv6 Routing and 10G Ethernet Switch Solutions with PoE Plus for SMBs

PLANET GS-5220-48P4X high-density, Layer 3 Managed PoE Switch series features PLANET intelligent PoE functions to improve the availability of critical business applications. It provides IPv6/IPv4 dual stack management and built-in **Layer 3 dynamic OSPFv2 and static routing** capability along with **48 10/100/1000BASE-T** ports featuring **IEEE 802.3at PoE+** and 4 additional 10G SFP+ uplink slots. With a total power budget of up to **400/720watts** for different kinds of PoE applications, the GS-5220-48P4X series provides a quick, safe and cost-effective PoE network solution for small businesses and enterprises.



The GS-5220-48P4X series can handle extremely large amounts of data in a secure topology linking to deploying Power over Ethernet networks, data center/service provider backbone or high capacity servers. It can work with a 10Gbps SFP+ server adapter to help SMBs build the 10Gbps Ethernet network providing 10Gbps NAS (Network Attached Storage) or heavy transmission of video streaming service.

Redundant Ring, Fast Recovery for Critical Network Applications

The GS-5220-48P4X series supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** technology and Spanning Tree Protocol (802.1w RSTP) into customer's network to

Physical Port

- **48 10/100/1000BASE-T** Gigabit RJ45 copper ports with 48-port **IEEE 802.3af/at PoE+** injector function
- **4 10GBASE-SR/LR SFP+ slots**, compatible with 1000/2500BASE-SX/LX/BX SFP
- RJ45 console interface for switch basic management and setup

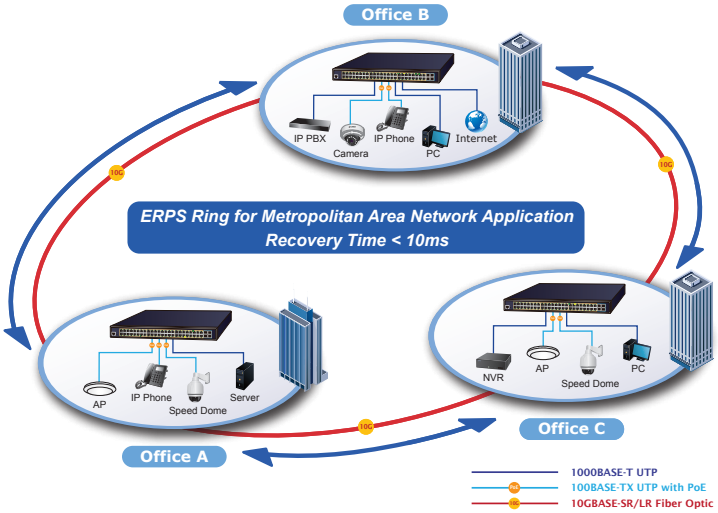
Power over Ethernet

- Complies with IEEE 802.3at Power over Ethernet Plus/end-span PSE
- Backward compatible with IEEE 802.3af Power over Ethernet
- Up to 48 ports of IEEE 802.3af/IEEE 802.3at devices powered
- Supports PoE power up to 36 watts for each PoE port
- Auto detects powered device (PD)
- Circuit protection prevents power interference between ports
- Remote power feeding up to 100 meters in standard mode and 200m in extended mode
- 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
  - Sequence port PoE
  - PoE extension
- Intelligent PoE features
  - 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 4K VLANs groups, out of 4094 VLAN IDs

enhance system reliability and uptime in harsh environments. In a certain simple Ring network, the recovery time could be **less than 10ms** to quickly bring the network back to normal operation.



Layer 3 Routing Support

The GS-5220-48P4X series enables the administrator to conveniently boost network efficiency by configuring Layer 3 IPv4/IPv6 VLAN static routing manually, and the **OSPFv2** (Open Shortest Path First) settings automatically. The OSPF is an interior dynamic routing protocol for autonomous system based on link state. The protocol creates a database for link state by exchanging link states among Layer 3 switches, and then uses the Shortest Path First algorithm to generate a route table based on that database.

Cybersecurity Network Solution to Minimize Security Risks

The cybersecurity feature included to protect the switch management in a mission-critical network virtually needs no effort and cost to install. The SSH, TLS and SSL protocols are utilized to provide strong protection against advanced threats. The network administrator can now construct highly-secure corporate networks with considerably less time and effort than before.

Flexible and Extendable 10Gbps Ethernet Solution

Each of the SFP+ slot supports triple speed **10GBASE-SR/LR**, **2500BASE-X** or **1000BASE-SX/LX/BX**, 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. With its 4-port, 10Gbps Ethernet link capability, the GS-5220-48P4X series provides broad bandwidth and powerful processing capacity.

Redundant AC/DC Power Supply to Ensure Continuous Operation

The GS-5220-48PL4XR are 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, it is able to act as a telecom-level device that can be located in the electronic room.

  - Supports provider bridging (VLAN Q-in-Q, IEEE 802.1ad)
  - Private VLAN Edge (PVE)
  - Protocol-based VLAN
  - MAC-based VLAN
  - Voice VLAN
  - GVRP (GARP VLAN Registration Protocol)
- Supports 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), spanning tree by VLAN
  - BPDU Guard
- Supports **Link Aggregation**
  - 802.3ad Link Aggregation Control Protocol (LACP)
  - Cisco ether-channel (static trunk)
  - Maximum 26 trunk groups with 4 ports for each trunk group
  - Up to 80Gbps 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
- Supports ERPS (Ethernet Ring Protection Switching)
- Compatible with Cisco uni-directional link detection(UDLD) that monitors a link between two switches and blocks the ports on both ends of the link if the link fails at any point between the two devices
- Link Layer Discovery Protocol (LLDP)
- Supports G.8032 ERPS (Ethernet Ring Protection Switching)

Layer 3 Features

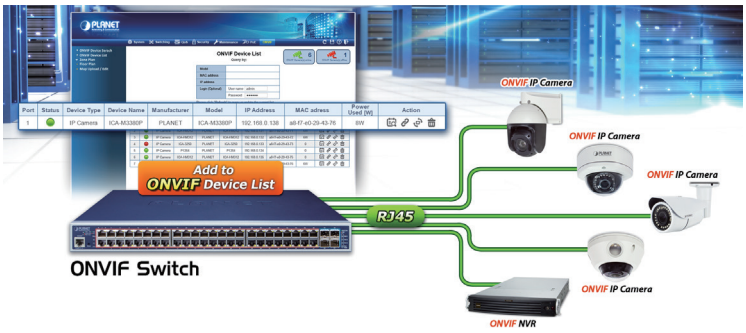
- IP dynamic routing protocol supports OSPFv2
- IPv4/IPv6 hardware static routing
- Routing interface provides per VLAN routing mode
- IP interfaces (Max. 128 VLAN interfaces)
- Routing table (Max. 128 routing entries)

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

Convenient and Smart ONVIF Devices with Detection Feature

PLANET has newly developed an awesome feature -- ONVIF Support -- which is specifically designed for co-operating with Video IP Surveillances. From the GS-5220-48P4X 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 to switch and allows for deployment 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.



Centralized Power Management for Gigabit Ethernet PoE Networking

To fulfill the needs of higher power required PoE network applications with Gigabit speed transmission, the GS-5220-48P4X series features IEEE 802.3at PoE+ that combines up to 36 watts of power output and data per port over one Cat5E/6 Ethernet cable. It is designed specifically to meet the demand of higher power consuming network PD (powered device) such as IR, PTZ, speed dome cameras or even box-type IP camera with a built-in fan and heater. Compliant with both 802.3at and 802.3af PoE, it allows more flexibility in power requirement for a variety of PDs.

Built-in Unique PoE Functions for Surveillance Management

As a managed PoE Switch for surveillance network, the GS-5220-48P4X series features four special PoE management functions:

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

Intelligent Powered Device Alive Check

The GS-5220-48P4X series can be configured to monitor connected PD status in real time via ping action. Once the PD stops working and has no response, the GS-5220-48P4X 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 reduce administrator management burden.

- Supports QoS and In/Out bandwidth control on each port
- Traffic-policing on the switch port
- DSCP remarking

Multicast

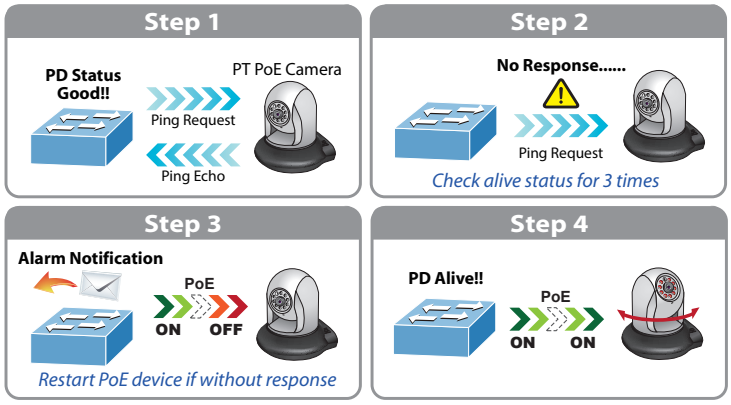
- Supports IPv4 IGMP snooping v1, v2 and v3
- Supports IPv6 MLD snooping v1 and v2
- Querier mode support
- IPv4 IGMP snooping port filtering
- IPv6 MLD snooping port filtering
- Multicast VLAN Registration (MVR) support

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
  - RADIUS/TACACS+ users access authentication
  - Guest VLAN assigns clients to a restricted VLAN with limited services
- 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
- IP address access management to prevent unauthorized intruder

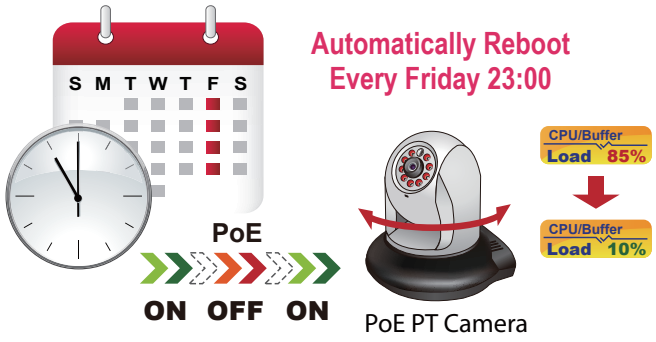
Management

- IPv4 and IPv6 dual stack management
- Switch Management Interfaces
  - Console/Telnet Command Line Interface
  - Web switch management
  - SNMP v1, v2c, and v3 switch management
  - SSHv2, TLSv1.2 secure access
- SNMP Management
  - Four RMON groups (history, statistics, alarms and events)
  - SNMP trap for interface Link Up and Link Down notification
- **IPv6** IP address/NTP/DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment



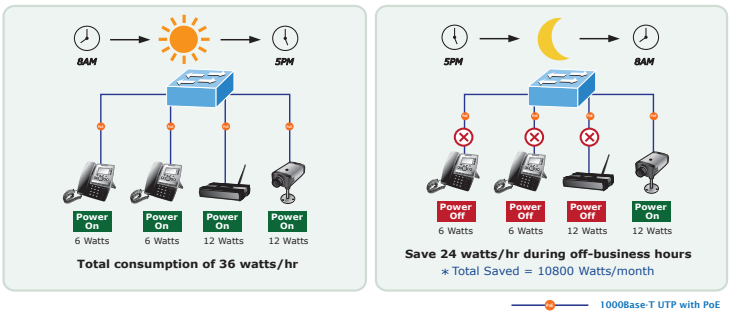
Scheduled Power Recycling

The GS-5220-48P4X series allows each of the connected PoE IP cameras to reboot at a specific time each week. Therefore, it will reduce the chance of IP camera crash resulting from buffer overflow.



PoE Schedule for Energy Saving

Besides IP surveillance, the GS-5220-48P4X series is certainly applicable to construct any PoE network including VoIP and wireless LAN. Under the trend of energy saving worldwide and contributing to environment protection on the Earth, the GS-5220-48P4X 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.



IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

To help customer stay on top of business, the GS-5220-48P4X series does not only offer ultra high transmission performance, but also IPv4/IPv6 VLAN routing feature which allows to cross over different VLAN groups and IP addresses for the purpose of having a highly-secure, flexible management.

- System Maintenance
  - Firmware upload/download via HTTP/TFTP
  - Reset button for system reboot or reset to factory default
  - Dual images
- DHCP Relay and DHCP Option 82
- DHCP Server
- User Privilege levels control
- NTP (Network Time Protocol)
- Network Diagnostic
  - ICMPv6/ICMPv4 remote ping
  - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
  - SFP-DDM (Digital Diagnostic Monitor)
- SMTP/Syslog remote alarm
- System Log
- PLANET Smart Discovery Utility for deployment management
- PLANET UNI-NMS (Universal Network Management) and Smart Discovery Utility for deployment management
- Smart fan with speed control

Redundant Power System (GS-5220-48P4XR and GS-5220-48PL4XR)

- 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

Robust Layer 2 Features

The GS-5220-48P4X series can be programmed for advanced switch management functions such as dynamic port link aggregation, **Q-in-Q VLAN**, private VLAN, **Multiple Spanning Tree Protocol (MSTP)**, Layer 2/4 QoS, bandwidth control and **IGMP/MLD snooping**. The GS-5220-48P4X series provides 802.1Q tagged VLAN, and the VLAN groups allowed will be maximally up to 256. Via aggregation of supporting ports, the GS-5220-48P4X series allows the operation of a high-speed trunk combining multiple ports. The switch enables a maximum of up to 26 trunk groups with 4 ports for each trunk group and supports connection fail-over as well.

Powerful Network Security

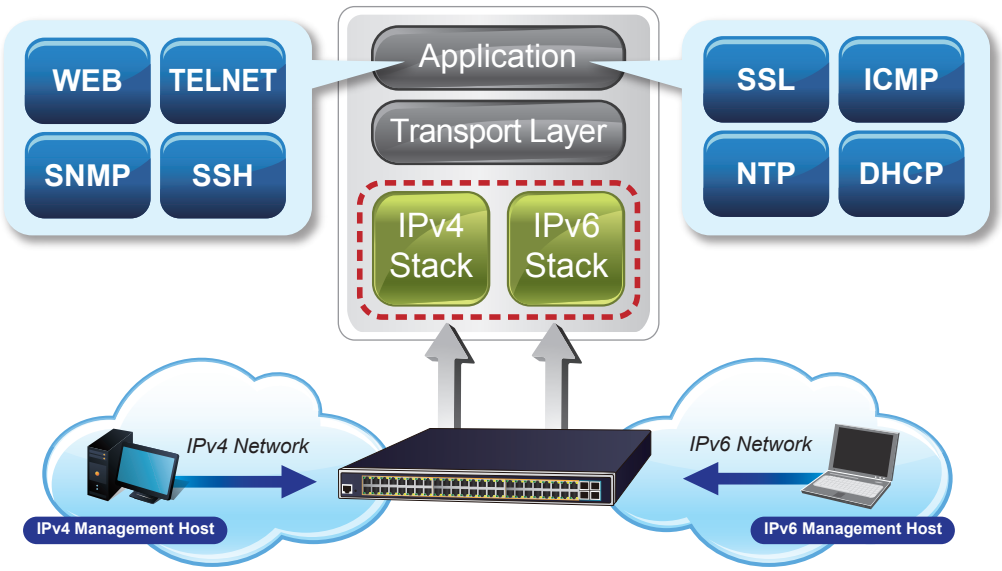
The GS-5220-48P4X series offers comprehensive **Layer 2 to Layer 4 Access Control List (ACL)** for enforcing security to the edge. It can be used to restrict network access by denying packets based on source and destination IP address, TCP/UDP ports or defined typical network application. Its protection mechanism also comprises **802.1x Port-based** and **MAC-based** customer and device authentication. As to **private VLAN** function, communications between edge ports can be protected to ensure customer privacy.

Enhanced Security and Traffic Control

The GS-5220-48P4X series also provides functions of **DHCP snooping**, **IP source guard** and **dynamic ARP inspection** so as to prevent IP from attacking and discarding ARP packets with invalid MAC address. The network administrators can now construct a highly-secure corporate network with considerably less time and effort than before.

IPv6/IPv4 Dual Stack

As the GS-5220-48P4X series supports the IPv6 Protocol, it helps SMBs and enterprises to step in the IPv6 era with the lowest investment, meaning the existing network facilities need not be replaced.



Efficient and Secure Management

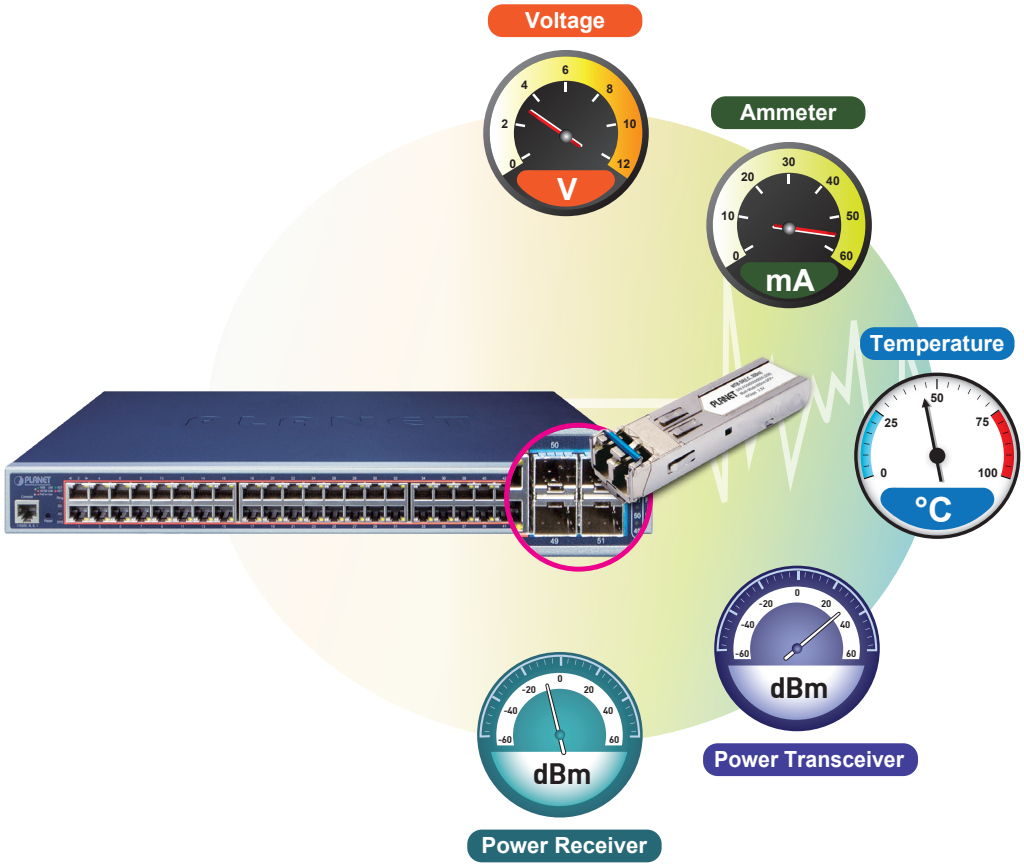
For efficient management, the GS-5220-48P4X series is equipped with console, Web and SNMP management interfaces. With the built-in Web-based management interface, the GS-5220-48P4X series offers an easy-to-use, platform-independent management and configuration facility. The GS-5220-48P4X series supports standard Simple Network Management Protocol (SNMP) and can be managed via any standard-based management software. For text-based management, the GS-5220-48P4X series can be accessed via Telnet and the console port. Moreover, the GS-5220-48P4X series offers secure remote management by supporting **SSHv2**, **TLS** and **SNMP v3** connection which encrypt the packet content at each session.

More and more engineers or administrators use Cisco command to manage Ethernet switch. For reducing product learning time, the GS-5220-48P4X series offers Cisco-like command and customers do not need to learn new command. With easy and friendly management interfaces, and plenty of management functions included, the GS-5220-48P4X series is the best choice for ISPs to build the IPv6 FTTx edge service and for SMBs to connect with the IPv6 network.

Intelligent SFP/SFP+ Diagnosis Mechanism

The GS-5220-48P4X series supports 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.

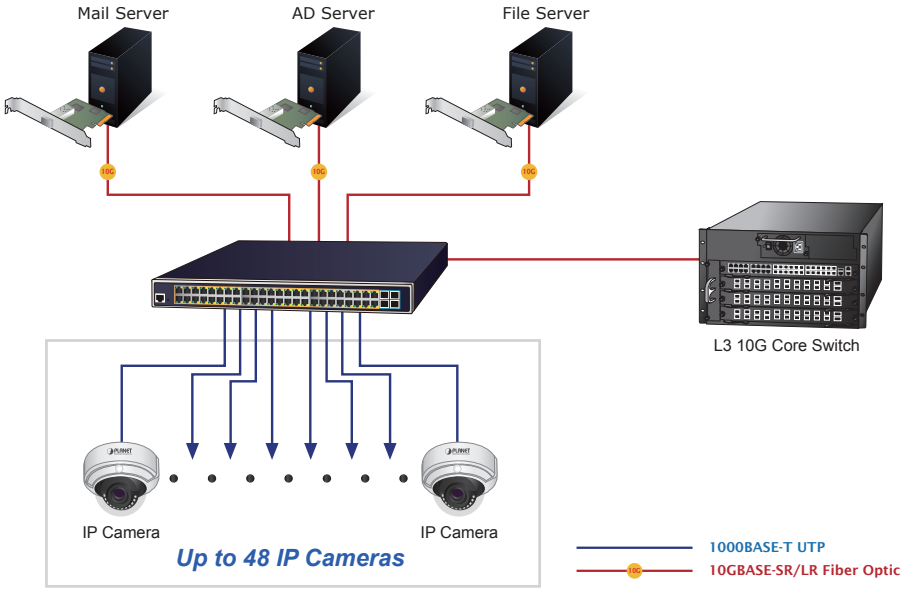
*Digital Diagnostic Monitor **(DDM)***



Applications

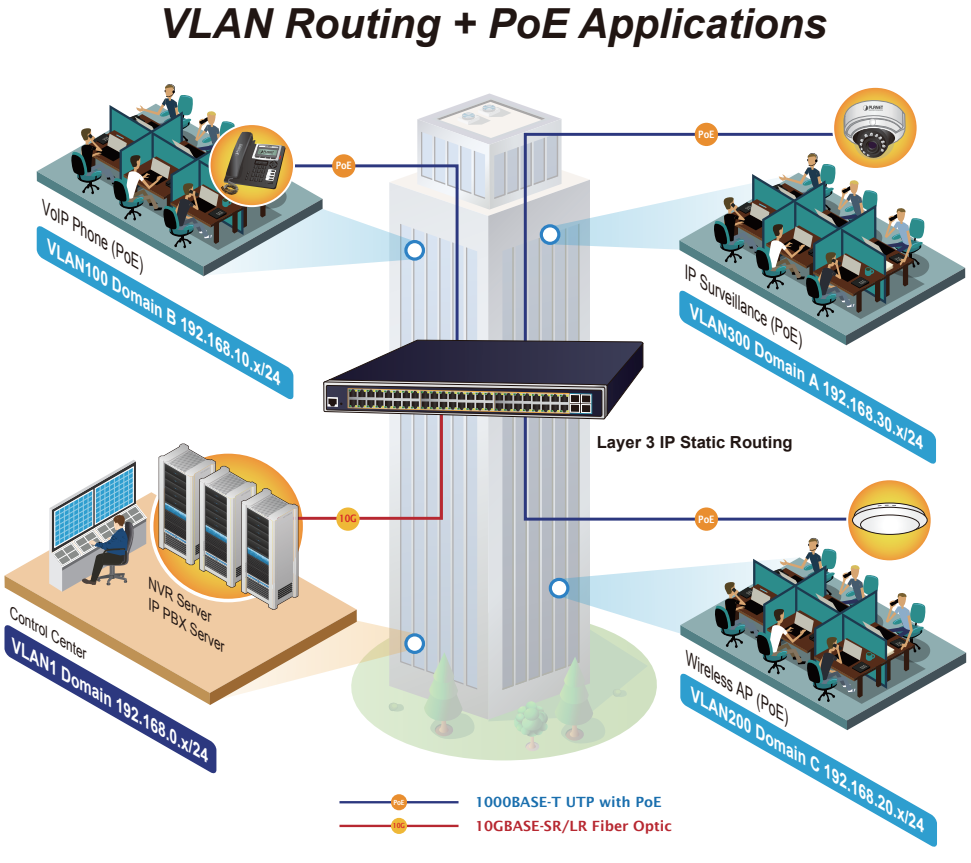
Excellent 10Gbps High Bandwidth for PoE Core Networks

Providing up to 48 PoE+, in-line power interfaces and four 10 SFP+ interfaces, the GS-5220-48P4X series can easily build a power for IP camera system centrally controlled by the enterprise. It can work with 8-/16-/32-channel NVR and surveillance software to perform comprehensive security monitoring. For instance, the PoE switch can combine with one 32-channel NVR and one 8-channel NVR; that is, each of its PoE ports can link to a specific PoE IP camera for the administrator to efficiently manage the surveillance system on one site. With the four built-in SFP+ ports, the GS-5220-48P4X series provides the uplink to the backbone network through the 10G Ethernet SR/LR SFP+ modules. It further improves the network efficiency and protects the network clients by offering the security and QoS features.



Layer 3 VLAN Routing and PoE Application

The GS-5220-48P4X series features IEEE 802.3at PoE+ that combines up to 36-watt power output per port. Its PoE budget is up to 720 watts which can deploy up to 48 PoE PD devices. With the built-in robust IPv4/IPv6 Layer 3 traffic routing protocol, the GS-5220-48P4X series ensures reliable routing between VLANs and network segments. The routing protocols can be applied by VLAN interface with up to 128 routing entries. The GS-5220-48P4X and GS-5220-48PL4XR are certainly a cost-effective and ideal solution for enterprises.



Specifications

Product	GS-5220-48P4X	GS-5220-48PL4XR
Hardware Specifications		
Copper Ports	48 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports	
SFP+ Slots	4 10GBASE-SR/LR SFP+ interfaces (Port-49 to Port-52) Compatible with 1000/2500BASE-SX/LX/BX SFP transceiver	
Console	1 x RS232-to-RJ45 serial port (115200, 8, N, 1)	
SDRAM	512Mbytes	
Flash Memory	64Mbytes	
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	4950g	4975g
Power Consumption	Max. 461 watts/1582 BTU	AC: Max. 900 watts/2333 BTU DC: Max. 36.6 watts/124.88 BTU
Power Requirements – AC	AC 100~240V, 50/60Hz, 7A	AC 100~240V, 50/60Hz, 9A
Power Requirements – DC	--	DC 36~60V, 2A
ESD Protection	6KV DC	
Fan	3 smart fans	
LED	System: SYS (Green) AC/PWR (Green) Ring (Green) DC (Green) (GS-5220-48PL4XR Only) Fan1/2/3 Alert (Red) PoE PWR Alert (Red) PoE Ethernet Interfaces (Port-1 to Port-48): PoE-in-use (Orange) Ethernet Interfaces (Port-1 to Port-48): 1000 LNK/ACT (Green), 10/100 LNK/ACT (Orange) 1//2.5/10G SFP+ Interfaces (Port-49 to Port-52): 1/2.5G (Green), 10G (Orange)	
Switching		
Switch Architecture	Store-and-Forward	
Switch Fabric	176Gbps/non-blocking	
Throughput	130Mpps@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	
Power over Ethernet		
PoE Standard	IEEE 802.3af/802.3at PoE PSE	
PoE Power Supply Type	End-span	
PoE Power Output	Per port 54V DC, 36 watts (max.)	
Power Pin Assignment	End-span: 1/2(+), 3/6(-)	
PoE Power Budget	400 watts (max.)	720 watts (max.)
PoE Ability PD @ 7 watts	48 units	48 units
PoE Ability PD @ 15 watts	26 units	48 units
PoE Ability PD @ 30 watts	13 units	24 units
PoE Management		
Active POE device alive detects	Yes	
PoE Power Recycle	Yes, daily or predeinded schedule	
PoE Schedule	4 schedule profiles	
PoE System Management	System PoE Admin control Total PoE power budget control Auto power input and PoE budget control PoE Legacy mode Over-temperature threshold alarm PoE usage threshold alarm	
Layer 3 Functions		
IP Interfaces	Max. 128 VLAN interfaces	
Routing Table	**Max**. 128 **routing entries**	

Routing Protocols	IPv4 OSPFv2 IPv4 hardware static routing IPv6 hardware static routing
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 VLAN Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN MVR (Multicast VLAN registration) Up to 4K VLAN groups, out of 4095 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk 26 groups with 4 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 IGMP querier mode support Up to 255 multicast groups
MLD Snooping	MLD (v1/v2) snooping MLD querier mode support Up to 255 multicast groups
Bandwidth Control	Per port bandwidth control Ingress: 100Kbps~1000Mbps Egress: 100Kbps~1000Mbps
Security Functions	
Access Control List	IP-based ACL/MAC-based ACL ACL based on: - MAC Address - IP Address - Ethertype - Protocol Type - VLAN ID - DSCP - 802.1p Priority Up to 256 entries
Security	Port Security IP source guard Dynamic ARP inspection Command line authority control based on user level
AAA	RADIUS client TACACS+ client
Network Access Control	IEEE 802.1x port-based network access control MAC-based authentication Local/RADIUS authentication
Switch Management	
Basic Management Interfaces	Console; Telnet Web browser SNMP v1, v2c

Secure Management Interfaces	SSHv2, TLSv1.2, SNMP v3	
System Management	Firmware upgrade by HTTP protocol through Ethernet network Configuration upload/download through HTTP Remote Syslog System log LLDP protocol NTP PLANET Smart Discovery Utility	
Event Management	Remote Syslog Local System log SMTP	
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 MAU-MIB
Standards Conformance		
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 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 RFC 2328 OSPF v2 ITU G.8032 ERPS Ring ITU-T G.8032 ERPS Ring
Environment		
Operating	Temperature: 0 ~ 50 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	
Storage	Temperature: -10 ~ 70 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	

Ordering Information

GS-5220-48P4X	L3 48-Port 10/100/1000T 802.3at PoE + 4-Port 10G SFP+ Managed Switch
GS-5220-48PL4XR	L3 48-Port 10/100/1000T 802.3at PoE + 4-Port 10G SFP+ Managed Switch with System Redundant Power (720W)

Related Products

GS-5220-24P4X	L3 24-Port 10/100/1000T 802.3at PoE + 4-Port 10G SFP+ Managed Switch
GS-5220-24PL4XR	L3 24-Port 10/100/1000T 802.3at PoE + 4-Port 10G SFP+ Managed Switch with Redundant Power

Available 10Gbps Modules

CB-DASFP-0.5M	10G SFP+ Directly-attached Copper Cable (0.5m in length)
CB-DASFP-2M	10G SFP+ Directly-attached Copper Cable (2m in length)
MTB-SR	10GBASE-SR mini-GBIC module - 300m
MTB-LR	10GBASE-LR mini-GBIC module – 10km
MTB-LA20	10GBASE-LX (WDM,TX:1270nm) mini-GBIC module - 20km
MTB-LB20	10GBASE-LX (WDM,TX:1330nm) mini-GBIC module - 20km
MTB-LA40	10GBASE-LX (WDM,TX:1270nm) mini-GBIC module - 40km
MTB-LB40	10GBASE-LX (WDM,TX:1330nm) mini-GBIC module - 40km
MTB-LA60	10GBASE-LX (WDM,TX:1270nm) mini-GBIC module - 60km
MTB-LB60	10GBASE-LX (WDM,TX:1330nm) mini-GBIC module - 60km

Available 1000Mbps Modules

MGB-GT	SFP-Port 1000BASE-T Module
MGB-SX	SFP-Port 1000BASE-SX mini-GBIC module - 220/550m
MGB-LX	SFP-Port 1000BASE-LX mini-GBIC module - 10km
MGB-L40	SFP-Port 1000BASE-LX mini-GBIC module - 40km
MGB-L80	SFP-Port 1000BASE-LX mini-GBIC module - 70km
MGB-L120	SFP-Port 1000BASE-LX mini-GBIC module - 120km
MGB-LA10	SFP-Port 1000BASE-LX (WDM,TX:1310nm) mini-GBIC module - 10km
MGB-LB10	SFP-Port 1000BASE-LX (WDM,TX:1550nm) mini-GBIC module - 10km
MGB-LA20	SFP-Port 1000BASE-LX (WDM,TX:1310nm) mini-GBIC module - 20km
MGB-LB20	SFP-Port 1000BASE-LX (WDM,TX:1550nm) mini-GBIC module - 20km
MGB-LA40	SFP-Port 1000BASE-LX (WDM,TX:1310nm) mini-GBIC module - 40km
MGB-LB40	SFP-Port 1000BASE-LX (WDM,TX:1550nm) mini-GBIC module - 40km

Available 2.5Gbps Modules

MGB-2GTSR	2.5G SFP Transceiver (Multi-mode, 850nm, DDM) - 300m
MGB-2GTLR2	2.5G SFP Transceiver (Single-mode, 1310nm, DDM) - 2km
MGB-2GTLR20	2.5G SFP Transceiver (Single-mode, 1310nm, DDM) - 20km
MGB-2GTLA20	2.5G SFP Transceiver (WDM, TX:1310nm RX:1550nm, DDM) - 20km
MGB-2GTLB20	2.5G SFP Transceiver (WDM, TX:1550nm RX:1310nm, DDM) - 20km
MGB-2GSR	2.5G SFP Transceiver (Multi-mode, 850nm, DDM) - 300m
MGB-2GLR2	2.5G SFP Transceiver (Single-mode, 1310nm, DDM) - 2km
MGB-2GLR20	2.5G SFP Transceiver (Single-mode, 1310nm, DDM) - 20km
MGB-2GLA20	2.5G SFP Transceiver (WDM, TX:1310nm RX:1550nm, DDM) - 20km
MGB-2GLB20	2.5G SFP Transceiver (WDM, TX:1550nm RX:1310nm, DDM) - 20km

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