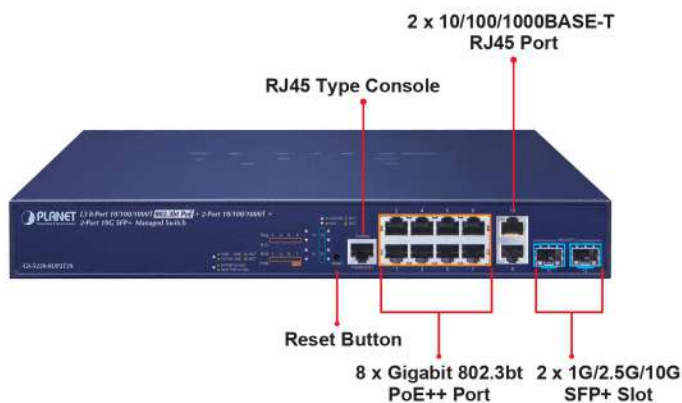# L3 8-Port 10/100/1000T 802.3bt PoE + 2-Port 10/100/1000T + 2-Port 10G SFP+ Managed Switch

Perfect 802.3bt PoE++ Managed Switch with L2+/L4 Switching and Security

PLANET GS-5220-8UP2T2X Layer 3 Managed Gigabit Switch supports both **IPv4 and IPv6 protocols** and **Layer 3 OSPFv2 dynamic routing and static routing**, and provides **8 10/100/1000BASE-T** ports featuring **95-watt 802.3bt PoE++**, **2 additional Gigabit copper ports** and another **2 extra 1/2.5/10 Gigabit BASE-X SFP+ fiber slots**. Each of the eight Gigabit ports provides 95 watts of power, with a total power budget of up to **240 watts** for the different types of PoE applications being employed. It provides a quick, safe and cost-effective Power over Ethernet network solution to IP security surveillance for small businesses and enterprises.

RJ45 Type Console

2 x 10/100/1000BASE-T RJ45 Port

Reset Button

8 x Gigabit 802.3bt PoE++ Port

2 x 1G/2.5G/10G SFP+ Slot

95 Watts of Power over 4-pair UTP

Adopting the IEEE 802.3bt 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), the GS-5220-8UP2TX 802.3bt PoE++ switch provides the capability to source up to 95 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 lighting
- PoE PTZ speed dome camera
- Any network device that needs higher PoE power to work normally
- Thin-client
- AIO (All-in-One) touch PC
- Remote digital signage display

Physical Port

- **8-port 10/100/1000BASE-T** with 95W PoE injector
- **2-port 1G/2.5G/10G BASE-X** SFP+
- RS-232 RJ45 console interface for switch basic management and setup

Power over Ethernet

- Up to 8 ports of IEEE 802.3af/802.3at/802.3bt devices powered
- Supports PoE Power up to 95 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 250m in extend mode
- PoE Management
  - PoE Port Status monitoring
  - Over Temperature Protection
  - PoE usage threshold
  - Temperature threshold
  - Per port PoE function enable/disable
  - PoE Port Power feeding priority
  - Per PoE port power limit
  - PD classification detection
  - Sequence port PoE

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
  - Supports provider bridging (VLAN Q-in-Q, IEEE 802.1ad)
  - Private VLAN Edge (PVE)
  - Protocol-based VLAN
  - MAC-based VLAN
  - Voice VLAN

Redundant Ring, Fast Recovery for Critical Network Applications

The GS-5220-8UP2T2X 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 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.

ERPS Ring for Video Transmission Redundancy

Cybersecurity Network Solution to Minimize Security Risks

The cybersecurity feature that virtually needs no effort and cost to have includes the protection of the switch management and the enhanced security of the mission-critical network. Both SSH and TLS protocols are utilized to provide strong protection against advanced threats.

Flexible and Extendable 10Gb Ethernet Solution

10G Ethernet is a big leap in the evolution of Ethernet. Each of the 10G SFP+ slots in the GS-5220-8UP2T2X supports triple speed and 10GBASE-SR/LR or 2500BASE-X and 1000BASE-SX/LX. With its 2-port,10G Ethernet link capability, 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. The GS-5220-8UP2T2X provides broad bandwidth and powerful processing capacity.

Built-in Unique PoE Functions for Surveillance Management

As a managed PoE Switch for surveillance network, the GS-5220-8UP2T2X features the following intelligent PoE management functions:

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

- – GVRP
- Supports **Spanning Tree Protocol**
  - – STP, IEEE 802.1D Spanning Tree Protocol
  - – RSTP, IEEE 802.1w Rapid Spanning Tree Protocol
  - – MSTP, 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 6 trunk groups, up to 4 ports per trunk group
  - – Up to 44Gbps 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)

Layer 3 IP Routing Features

- IP dynamic routing protocol supports OSPFv2
- Routing interface provides per VLAN routing mode
- Supports maximum 128 static routes and route summarization

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 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

Intelligent Powered Device Alive Check

The GS-5220-8UP2T2X can be configured to monitor a connected PD status in real time via ping action. Once the PD stops working and it is without response, the GS-5220-8UP2T2X 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, thus reducing administrator management burden.
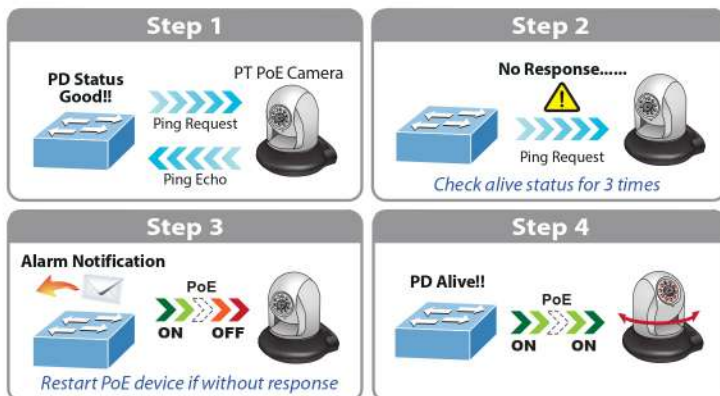
Scheduled Power Recycling

The GS-5220-8UP2T2X allows each of the connected PDs to reboot at a specified time each week. Therefore, it will reduce the chance of PD crash resulting from buffer overflow.
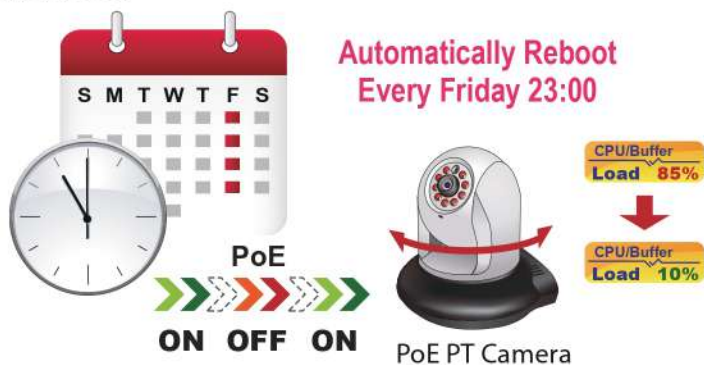

PoE Schedule for Energy Saving

Besides being used for IP surveillance, the GS-5220-8UP2T2X is certainly applicable to build any PoE network including VoIP and wireless LAN. Under the trend of energy saving worldwide and contributing to the environmental protection on the Earth, the GS-5220-8UP2T2X 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 and enterprises save energy and budget.

Security

- Authentication
    - IEEE 802.1x Port-based/MAC-based network access authentication
    - Built-in RADIUS client to co-operate with the RADIUS servers
    - TACACS+ login users access authentication
    - 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 un-trusted 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
    - Web switch management
    - Console/Telnet Command Line Interface
    - SNMP v1 and v2c switch management
    - SSHv2, TLSv1.2 and SNMPv3 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 Option82
- 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
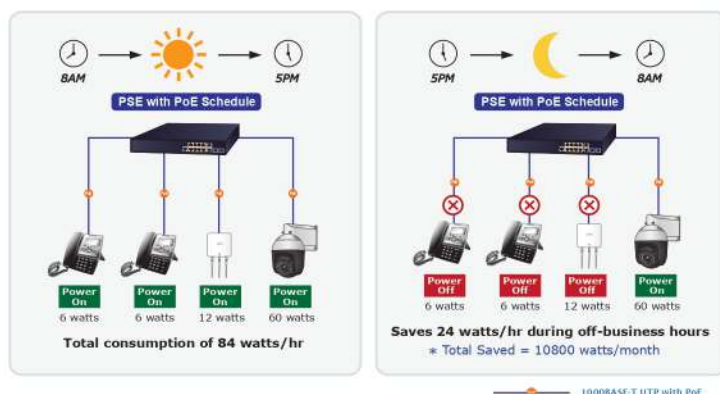
- SMTP/Syslog remote alarm
- Four RMON groups (history, statistics, alarms and events)
- SNMP trap for interface Linkup and Link down notification
- System Log
- PLANET NMS System and Smart Discovery Utility for deployment management
- Provides ONVIF for co-operating with PLANET video IP surveillances

PoE Usage Monitoring

Via the power usage chart in the web management interface, the GS-5220-8UP2T2X 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.

802.3bt PoE++ Power and Ethernet Data Transmission Distance Extension

In the "Extend" operation mode, the GS-5220-8UP2T2X operates on a per-port basis at 10Mbps duplex operation but can support 95-watt PoE power output over a distance of up to 250 meters overcoming the 100m limit on Ethernet UTP cable. With this brand-new feature, the GS-5220-8UP2T2X provides an additional solution for 802.3at/af PoE distance extension, thus saving the cost of Ethernet cable installation.
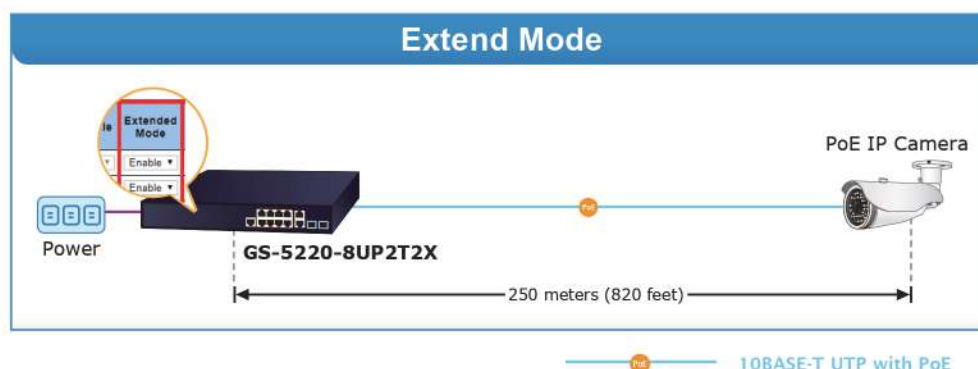
SMTP/SNMP Trap Event Alert

Though most NVR or camera management software offers SMTP email alert function, the GS-5220-8UP2T2X further provides event alert function to help to diagnose the abnormal device owing to whether or not there is a break of the network connection, loss of PoE power or the rebooting response by the PD Alive Check process.


4

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-5220-8UP2T2X GUI, you just need one click to search and show all of the ONVIF devices via network application. In addition, you can upload floor images to the switch and remotely monitor what is going on in the production line. Moreover, you can get real-time surveillance's information and online/offline status, and can have PoE reboot control from GUI.

Solution for IPv6 Networking

With the support for IPv6/IPv4 protocol, and easy and friendly management interfaces, the GS-5220-8UP2T2X is the best choice for IP surveillance, VoIP and wireless service providers to connect with the IPv6 network. It also helps SMBs to step in the IPv6 era with the lowest investment and without having to replace the network facilities even though ISPs establish the IPv6 FTTx edge network.
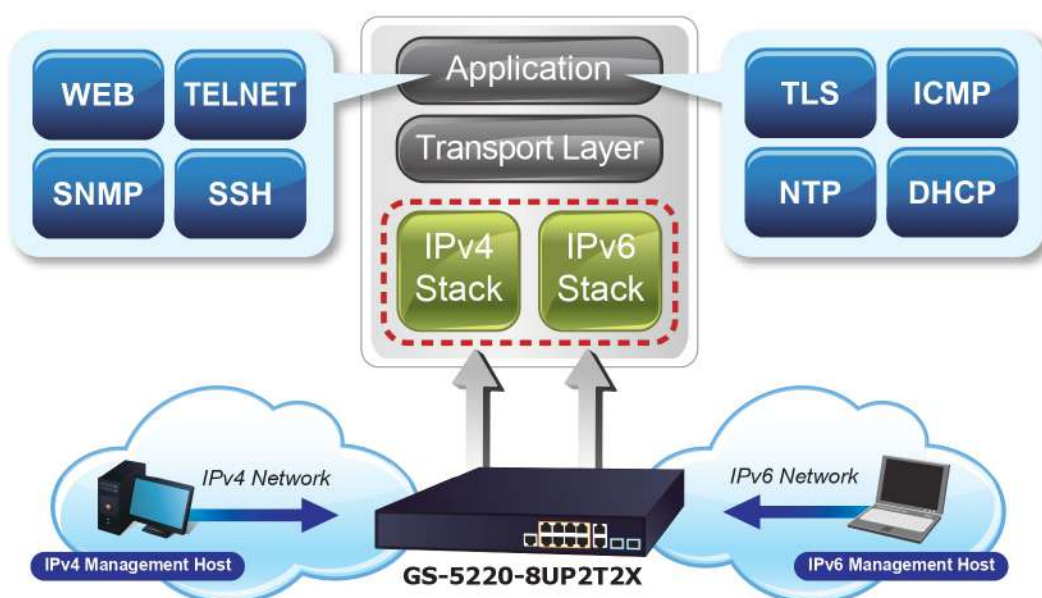
Layer 3 Routing Support

The GS-5220-8UP2T2X 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 Layer3 switches, and then uses the Shortest Path First algorithm to generate a route table based on that database.

Robust Layer2 Features

The GS-5220-8UP2T2X can be programmed for advanced switch management function, 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 GS-5220-8UP2T2X allows the operation of a high-speed trunk combining multiple ports. Supporting 6 trunk groups, it enables a maximum of up to 8 ports per trunk and supports connection fail-over as well.

Powerful Security

The GS-5220-8UP2T2X 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 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 GS-5220-8UP2T2X 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 build highly-secure corporate networks with considerably less time and effort than before.

User-friendly Secure Management

For efficient management, the GS-5220-8UP2T2X is equipped with console, web and SNMP management interfaces. With the built-in web-based management interface, theGS-5220-8UP2T2X offers an easy-to-use, platform independent management and configuration facility. The GS-5220-8UP2T2X supports SNMP and it can be managed via any management software based on the standard SNMP v1 and v2 protocols. For reducing product learning time, the GS-5220-8UP2T2X offers Cisco-like command via Telnet or console port and customer doesn't need to learn new command from these switches. Moreover, the GS-5220-8UP2T2X offers remote secure management by supporting **SSHv2**, **TLSv1.2** and **SNMPv3** connection which can encrypt the packet content at each session.

Intelligent SFP Diagnosis Mechanism

The GS-5220-8UP2T2X supports **SFP-DDM (Digital Diagnostic Monitor)** function that greatly helps network administrator to easily monitor real-time parameters of the SFP transceivers, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

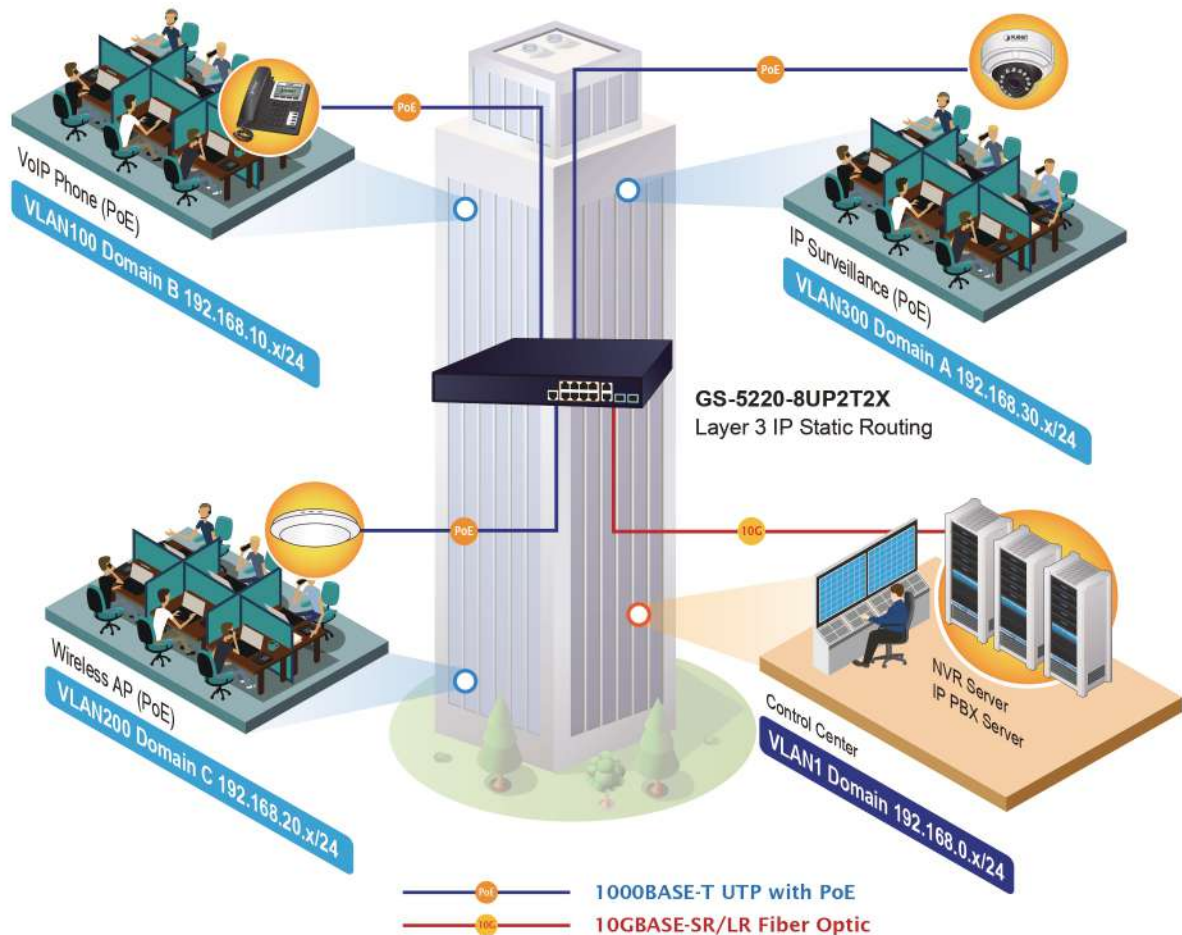## Digital Diagnostic Monitor *(DDM)*

Applications

Layer 3 VLAN Static Routing and PoE Application

With the built-in robust IPv4/IPv6 Layer 3 traffic routing protocols, the GS-5220-8UP2T2X 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-5220-8UP2T2X is certainly a cost-effective and ideal solution for enterprises.

Providing up to 8 Gigabit PoE++ ports and in-line power interface, the GS-5220-8UP2T2X PoE++ Managed Switch can easily build a centrally-controlled power network shared by wireless Gigabit AP, IP phone system, or mega-pixel IP camera system group for the enterprises.

VLAN Routing + PoE Applications

VoIP Phone (PoE)
VLAN100 Domain B 192.168.10.x/24

IP Surveillance (PoE)
VLAN300 Domain A 192.168.30.x/24

GS-5220-8UP2T2X
Layer 3 IP Static Routing

Wireless AP (PoE)
VLAN200 Domain C 192.168.20.x/24

NVR Server
IP PBX Server

Control Center
VLAN1 Domain 192.168.0.x/24

1000BASE-T UTP with PoE
10GBASE-SR/LR Fiber Optic
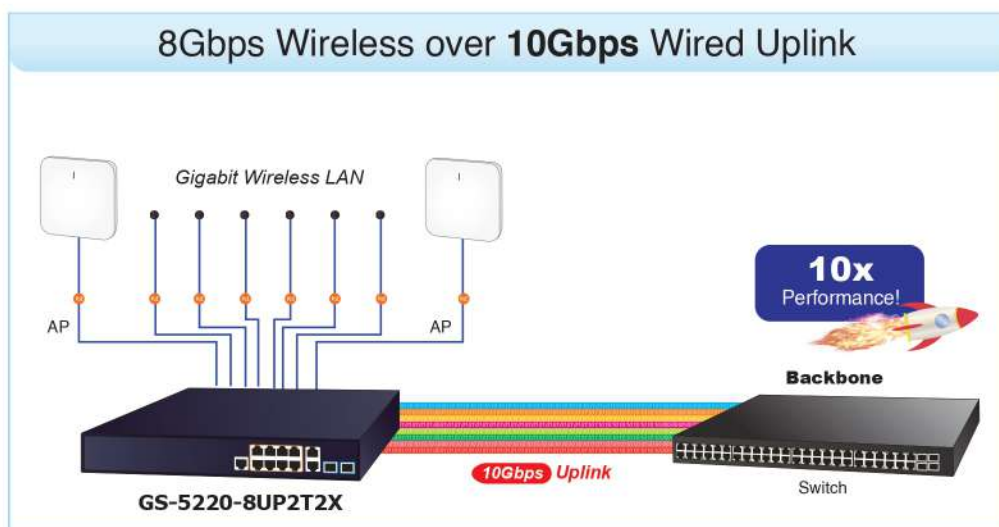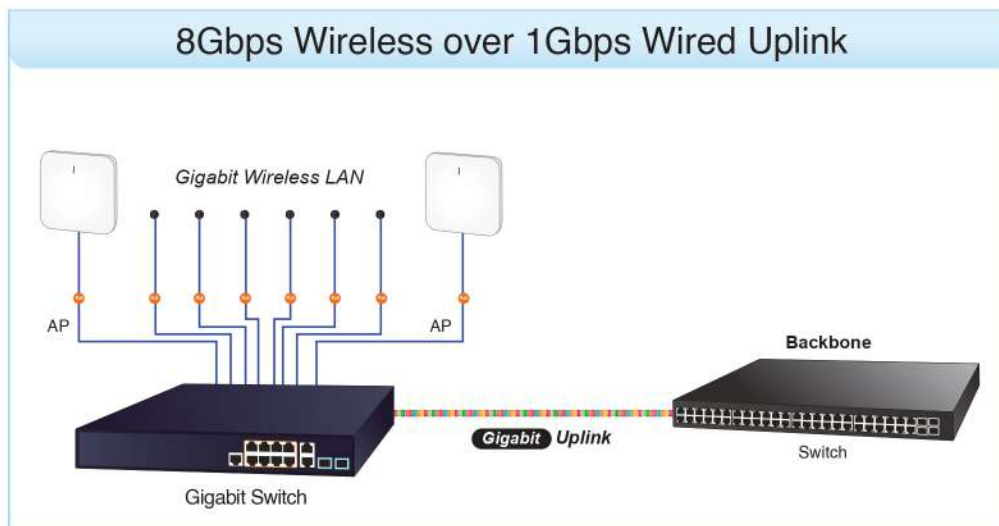
PoE Wi-Fi Hotspot Solution with Extended Network Infrastructure for Public Spaces

The GS-5220-8UP2T2X comes with non-blocking design, desktop size and SFP fiber-optic modules, bringing network infrastructure higher flexibility but lower in cost. Providing eight 10/100/1000BASE-T PoE++ ports, in-line power interfaces and two 10 Gigabit SFP interfaces, the GS-5220-8UP2T2X can easily build a Networking Authentication on Wireless LAN Controllers system for the enterprises. For instance, it can work with the Wireless Controller and RADIUS Server to perform comprehensive security for wireless user authentication with powered APs.

8Gbps Wireless over 1Gbps Wired Uplink

Gigabit Wireless LAN

AP

AP

Backbone

Gigabit Uplink

Switch

Gigabit Switch

8Gbps Wireless over **10Gbps** Wired Uplink

Gigabit Wireless LAN

AP

AP

10x
Performance!

Backbone

10Gbps Uplink

Switch

GS-5220-8UP2T2X

Specifications

Product	GS-5220-8UP2T2X
Hardware Specifications	
Copper Ports	10 x 10/100/1000BASE-T RJ45 Auto-MDI/MDI-X interface with Port-1 to Port-10
SFP/mini-GBIC Slots	2 x 1G/2.5G/10G BASE-X SFP interfaces with Port-11 to Port-12
PoE Injector Port	8 ports with 802.3bt/at/af PoE injector function with Port-1 to Port-8
Console	1 x RJ45 serial port (115200 , 8, N, 1)
Reset Button	< 5 sec: System reboot > 5 sec: Factory default
Power Requirements	100~240V AC, 50/60Hz
Power Consumption (Full Loading)	284 watts/969BTU (max.)
ESD Protection	6KV DC
Dimensions (W x D x H)	330 x 200 x 43.5 mm, 1U height
Weight	2.1kg
LED	**System:** Ring (Green), R.O (Green), SYS (Green), PWR (Green) **10/100/1000BASE-T RJ45 Interfaces (Port 1 to Port 10):** 1000Mbps LNK/ACT (Green) 10/100Mbps LNK/ACT (Orange) 802.3bt PoE-in-Use (Green) (Port 1 to Port 8) 802.3at/af PoE-in-Use (Orange) (Port 1 to Port 8) **1G/2.5G/10G Mbps SFP Interfaces (Port 11 to Port 12):** 1G/2.5G LNK/ACT (Green) 10G Mbps (Orange)
Switching Specifications	
Switch Architecture	Store-and-Forward
Switch Fabric	60Gbps/non-blocking
Throughput	44.642Mpps@ 64Bytes packet
Address Table	16K entries, automatic source address learning and aging
Shared Data Buffer	16Mbits
Flow Control	IEEE 802.3x pause frame for full-duplex Back pressure for half-duplex
Jumbo Frame	9KB
Power over Ethernet	
PoE Standard	802.3bt PoE++ PSE Backward compatible with IEEE 802.3at PoE PSE
PoE Power Supply Type	802.3bt UPoE End-span Mid-span Force
PoE Power Output	Per port 52V DC 802.3bt mode, Port-1 to Port-8: maximum 90 watts UPoE mode, Port-1 to Port-8: maximum 95 watts Force mode, Port-1 to Port-8: maximum 60 watts End-span mode: maximum 36 watts Mid-span mode: maximum 36 watts
Power Pin Assignment	802.3bt: 1/2(-), 3/6(+), 4/5(+), 7/8(-) UPoE: 1/2(-), 3/6(+), 4/5(+), 7/8(-) End-span: 1/2(-), 3/6(+) Mid-span: 4/5(+), 7/8(-)
PoE Power Budget	240 watts (max.) @ 25 degrees C 200 watts (max.) @ 50 degrees C
Number of 90W 802.3bt Type-4 PDs	2
Number of 60W 802.3bt Type-3 PDs	4
Number of 802.3at PDs	8
PoE Functions	
PoE System Management	System PoE Admin control PoE Legacy mode Over-temperature threshold alarm PoE usage threshold alarm

PoE Port Management	Port Enable/Disable/Schedule
	PoE mode control
	  - 802.3bt
	  - UPoE
	  - 802.3at End-span
	  - 802.3at Mid-span
	Force mode
	Port Priority

PoE Extend Mode	Per PoE port, max. 160 to 250 meters

PoE Device Live Detection	Per port remote PD IP address
	4 actions
	  - None
	  - PD reboot
	  - PR reboot and alarm
	  - Alarm

PoE Power Recycle	Yes, daily or predeinded schedule
PoE Schedule	4 schedule profiles
Layer 2 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, up to 4K VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN MVR (Multicast VLAN Registration) GVRP Up to 4K VLAN groups, out of 4094 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/Static Trunk Supports 6 trunk groups with 4 ports per trunk

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	IPv4 IGMP (v1/v2/v3) snooping IPv4 IGMP querier mode support Supports 255 IGMP groups
MLD Snooping	IPv6 MLD (v1/v2) snooping, IPv6 MLD querier mode support Supports 255 MLD groups

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

Bandwidth Control	Per port bandwidth control
	  Ingress: 10Kbps~13000Mbps
	  Egress: 10Kbps~13000Mbps

Layer 3 Functions	
IP Interfaces	Max. 128 VLAN interfaces
Routing Table	Max. 128 routing entries

Routing Protocols	IPv4 OSPFv2 dynamic routing IPv4 hardware static routing IPv6 hardware static routing
Management	
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSHv2, TLSv1.2, SNMPv3
Management Functions	Firmware upgrade by HTTP/TFTP protocol through Ethernet network Remote syslog and local system log LLDP protocol SNTP PLANET Smart Discovery Utility
ONVIF	ONVIF device discovery ONVIF device monitoring Floor Map
SNMP MIBs	RFC 1213 MIB-II RFC 2863 IF-MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2737 Entity MIB RFC 2819 RMON MIB (Groups 1, 2, 3 and 9) RFC 2618 RADIUS Client MIB RFC 3411 SNMP-Frameworks-MIB RFC 3621 Power Ethernet 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 802.3af Power over Ethernet IEEE 802.3u 100BASE-TX IEEE 802.3at Power over Ethernet Plus IEEE 802.3z 1000BASE-SX/LX IEEE 802.3bt 4-pair Power over Ethernet Plus Plus IEEE 802.3ab 1000BASE-T RFC 768 UDP IEEE 802.3ae 10Gb/s Ethernet RFC 793 TFTP IEEE 802.3x flow control and back pressure RFC 791 IP IEEE 802.3ad port trunk with LACP RFC 792 ICMP IEEE 802.1D Spanning Tree Protocol RFC 2068 HTTP IEEE 802.1w Rapid Spanning Tree Protocol RFC 1112 IGMP v1 IEEE 802.1s Multiple Spanning Tree Protocol RFC 2236 IGMP v2 IEEE 802.1p Class of Service RFC 3376 IGMP v3 IEEE 802.1Q VLAN tagging RFC 2710 MLD v1 IEEE 802.1x Port Authentication Network Control FRC 3810 MLD v2 IEEE 802.1ab LLDP RFC 2328 OSPF v2
Environments	
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-5220-8UP2T2X	L3 8-Port 10/100/1000T 802.3bt PoE + 2-Port 10/100/1000T + 2-Port 10G SFP+ Managed Switch

Available 10Gbps Modules

MTB-RJ	1-Port 10GBASE-T SFP+ Copper Fiber Optic Module - 30m
MTB-SR	1-Port 10GBASE-SR SFP+ Fiber Optic Module - 300m
MTB-SR2	1-Port 10GBASE-SR SFP+ Fiber Optic Module – 2km
MTB-LR	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 10km
MTB-LR20	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 20km
MTB-LR40	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 40km
MTB-LR60	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 60km
MTB-LR80	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 80km
MTB-TSR	1-Port 10GBASE-SR SFP+ Fiber Optic Module - 300m (-40~75 degrees C)
MTB-TSR2	1-Port 10GBASE-SR SFP+ Fiber Optic Module – 2km (-40~75 degrees C)
MTB-TLR	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 10km (-40~75 degrees C)
MTB-TLR20	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 20km (-40~75 degrees C)
MTB-TLR40	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 40km (-40~75 degrees C)
MTB-TLR60	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 60km (-40~75 degrees C)
MTB-TLA20	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 20km (TX:1270nm RX:1330nm) (-40~75 degrees C)
MTB-TLB20	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 20km (TX:1330nm RX:1270nm) (-40~75 degrees C)
MTB-TLA40	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 40km (TX:1270nm RX:1330nm) (-40~75 degrees C)
MTB-TLB40	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 40km (TX:1330nm RX:1270nm) (-40~75 degrees C)
MTB-TLA60	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 60km (TX:1270nm RX:1330nm) (-40~75 degrees C)
MTB-TLB60	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 60km (TX:1330nm RX:1270nm) (-40~75 degrees C)
MTB-LA10	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 10km (TX:1270nm RX:1330nm)
MTB-LB10	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 10km (TX:1330nm RX:1270nm)
MTB-LA20	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 20km (TX:1270nm RX:1330nm)
MTB-LB20	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 20km (TX:1330nm RX:1270nm)
MTB-LA40	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 40km (TX:1270nm RX:1330nm)
MTB-LB40	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 40km (TX:1330nm RX:1270nm)
MTB-LA60	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 60km (TX:1270nm RX:1330nm)
MTB-LB60	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 60km (TX:1330nm RX:1270nm)
MTB-LA70	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 70km (TX:1270nm RX:1330nm)
MTB-LB70	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 70km (TX:1330nm RX:1270nm)

Available 2500Mbps Modules

MGB-2GTSR	2.5G SFP Transceiver (Multi-mode, 850nm, DDM, -40~75°C) - 300m
MGB-2GTLA20	2.5G SFP Transceiver (WDM, TX:1310nm RX:1550nm, DDM, -40~75°C) - 20km
MGB-2GTLB20	2.5G SFP Transceiver (WDM, TX:1550nm RX:1310nm, DDM, -40~75°C) - 20km

Available 1000Mbps Modules

MGB-GT	SFP-Port 1000 BASE-T Module
MGB-LX	SFP-Port 1000 BASE-LX mini-GBIC module - 20km
MGB-SX	SFP-Port 1000 BASE-SX mini-GBIC module - 550m
MGB-SX2	SFP-Port 1000 BASE-SX mini-GBIC module - 2km
MGB-L40	SFP-Port 1000 BASE-LX mini-GBIC module - 40km
MGB-L80	SFP-Port 1000 BASE-LX mini-GBIC module - 80km
MGB-L120	SFP-Port 1000 BASE-LX mini-GBIC module - 120km
MGB-LA10	SFP-Port 1000 BASE-BX (WDM, TX:1310nm) mini-GBIC module - 10km
MGB-LB10	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 10km
MGB-LA20	SFP-Port 1000 BASE-BX (WDM, TX:1310nm) mini-GBIC module - 20km
MGB-LB20	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 20km
MGB-LA40	SFP-Port 1000 BASE-BX (WDM, TX:1310nm) mini-GBIC module - 40km
MGB-LB40	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 40km
MGB-LA80	SFP-Port 1000 BASE-BX (WDM, TX:1490nm) mini-GBIC module - 80km
MGB-LB80	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 80km
MGB-TSX	SFP-Port 1000 BASE-SX mini-GBIC module - 550m (-40~75 degrees C)
MGB-TSX2	SFP-Port 1000 BASE-SX mini-GBIC module - 2km (-40~75 degrees C)
MGB-TLX	SFP-Port 1000 BASE-LX mini-GBIC module - 20km (-40~75 degrees C)
MGB-TL40	SFP-Port 1000 BASE-LX mini-GBIC module - 40km (-40~75 degrees C)
MGB-TL80	SFP-Port 1000 BASE-LX mini-GBIC module - 80km (-40~75 degrees C)
MGB-TSA	SFP-Port 1000 BASE-BX (WDM, TX:1310nm) mini-GBIC module - 2km (-40~75 degrees C)
MGB-TSB	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 2km (-40~75 degrees C)
MGB-TLA10	SFP-Port 1000 BASE-BX (WDM, TX:1310nm) mini-GBIC module - 10km (-40~75 degrees C)
MGB-TLB10	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 10km (-40~75 degrees C)
MGB-TLA20	SFP-Port 1000 BASE-BX (WDM, TX:1310nm) mini-GBIC module - 20km (-40~75 degrees C)
MGB-TLB20	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 20km (-40~75 degrees C)
MGB-TLA40	SFP-Port 1000 BASE-BX (WDM, TX:1310nm) mini-GBIC module - 40km (-40~75 degrees C)
MGB-TLB40	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 40km (-40~75 degrees C)
MGB-TLA80	SFP-Port 1000 BASE-BX (WDM, TX:1490nm) mini-GBIC module - 80km (-40~75 degrees C)
MGB-TLB80	SFP-Port 1000 BASE-BX (WDM, TX:1550nm) mini-GBIC module - 80km (-40~75 degrees C)

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