Product Specifications

16-Port 10/100/1000T Ultra PoE + 4-Port Gigabit TP/SFP Combo Managed Switch

GS-4210-16UP4C

Version 1.0

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Change History:

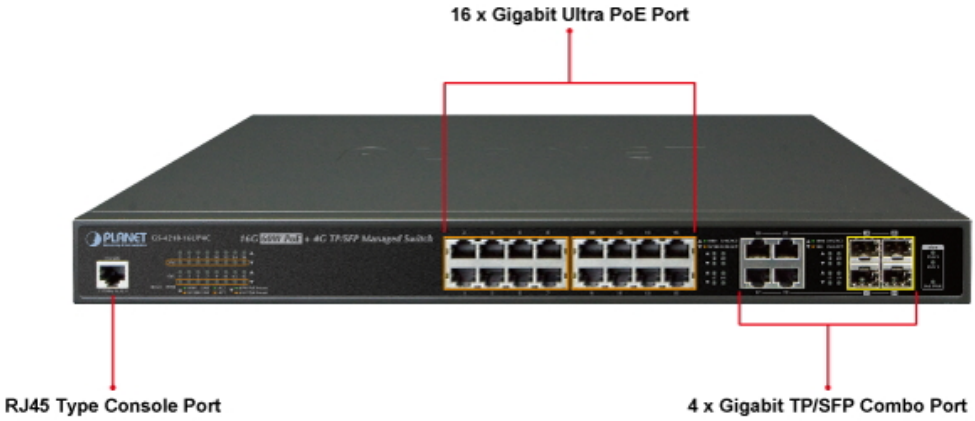
Revision:	Date:	Author:	Change List
Version 1.0	3/27/2016	Jos Li	Initial Release

Author:	Jos Li	**Editor:**	Jos Li
Reviewed by:	Kent Kang	**Approved by:**	Kent Kang

1. PRODUCT DESCRIPTION

A New Generation Ultra PoE Managed Switch with Advanced L2/L4 Switching and Security

PLANET GS-4210-16UP4C is a cost-optimized, 1U, Gigabit Ultra PoE Managed Switch featuring PLANET **intelligent PoE** functions to improve the availability of critical business applications. It provides IPv6/IPv4 dual stack management and built-in L2/L4 Gigabit switching engine along with **16 10/100/1000BASE-T** ports featuring **60-watt Ultra PoE** and **4 additional Gigabit TP/SFP combo ports**. With a total power budget of up to 400 watts for different kinds of PoE applications, respectively, the GS-4210-16UP4C provides a quick, safe and cost-effective Ultra PoE network solution for small businesses and enterprises.



60 Watts of Power over 4-pair UTP

The GS-4210-16UP4C Ultra PoE solution adopts the IEEE 802.3at/af standard. Instead of delivering power over 2-pair twisted UTP – be it end-span (Pin 1, 2, 3 and 6) or mid-span (Pin 4, 5, 7 and 8), it provides the capability to source up to 60 watts of power by using all the four pairs of standard Cat5e/6 Ethernet cabling. In the new 4-pair system, two PSE controllers will be used to power both the data pairs and the spare pairs. It can offer more PoE applications, such as:

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

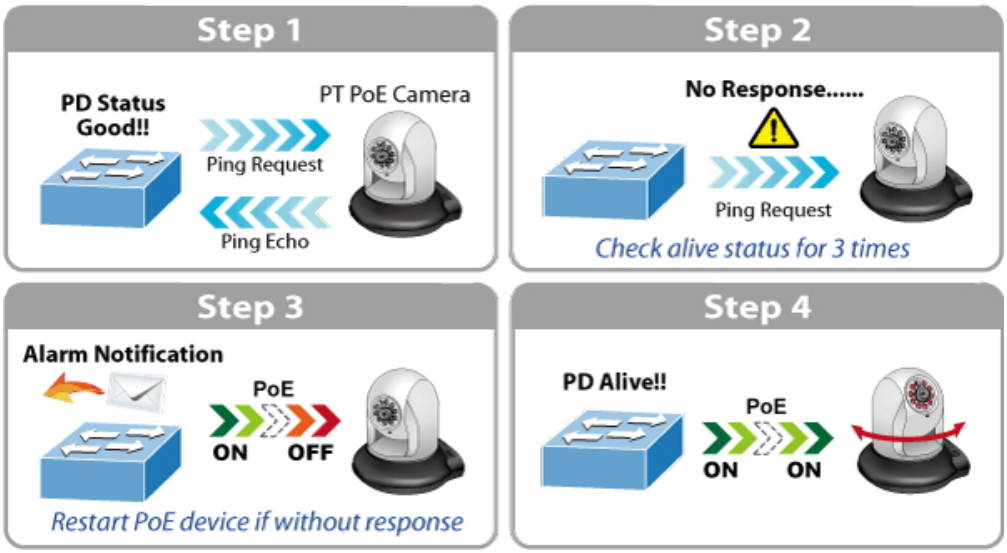
Built-in Unique PoE Functions for Powered Devices Management

As it is the managed PoE switch for surveillance, wireless and VoIP networks, the GS-4210-16UP4C features the following special PoE management functions:

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

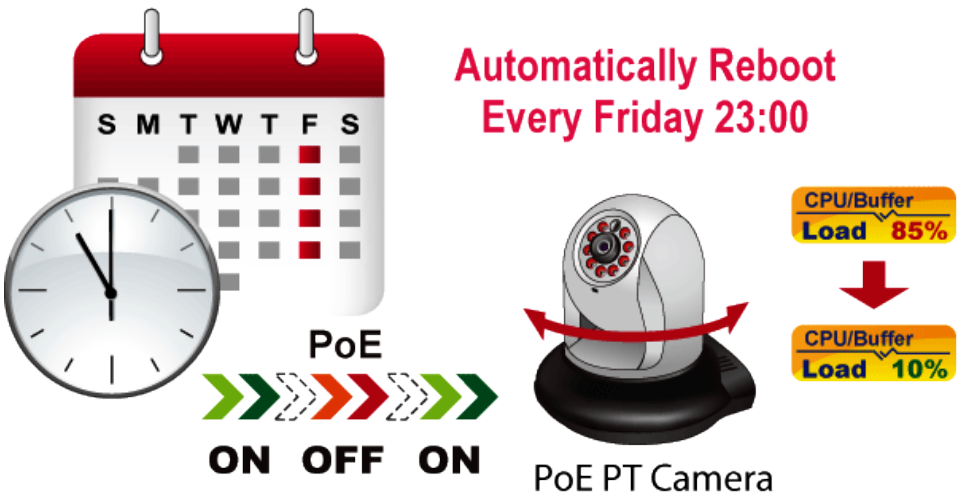
Intelligent Powered Device Alive Check

The GS-4210-16UP4C can be configured to monitor connected PD (Powered Device) status in real time via ping action. Once the PD stops working and responding, the GS-4210-16UP4C 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.



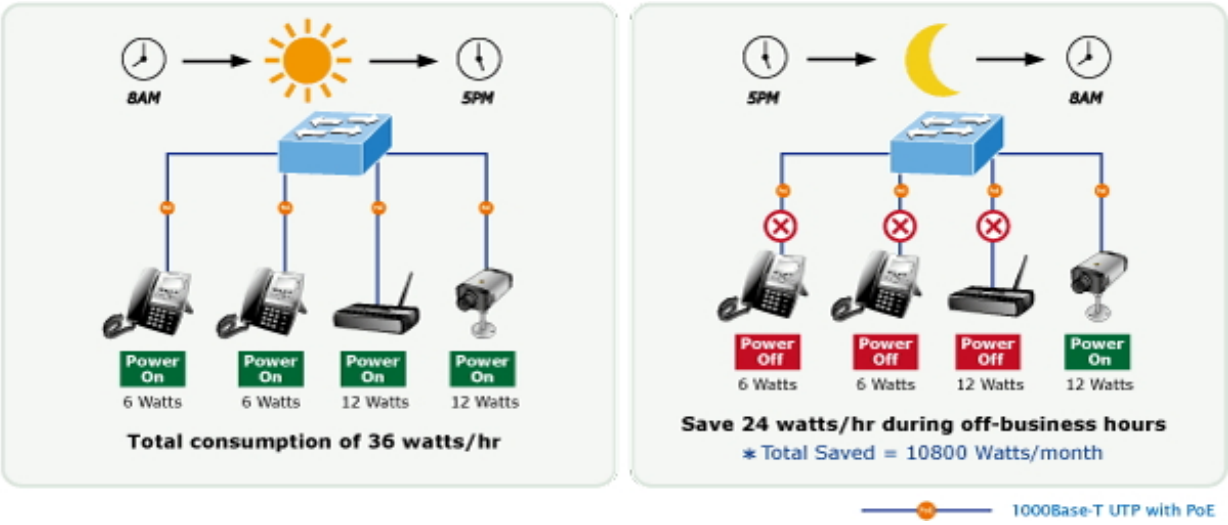
Scheduled Power Recycling

The GS-4210-16UP4C allows each of the connected PoE IP cameras or PoE wireless access points to reboot at a specified time each week. Therefore, it will reduce the chance of IP camera or AP crash resulting from buffer overflow.



PoE Schedule for Energy Saving

Under the trend of energy saving worldwide and contributing to environmental protection, the GS-4210-16UP4C 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 GS-4210-16UP4C 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.

Environment-friendly, Smart Fan Design for Silent Operation

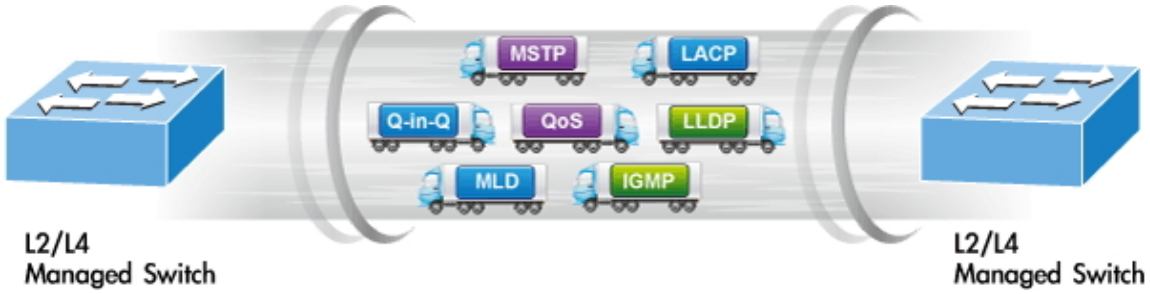
The GS-4210-16UP4C features a desktop-sized metal housing, a low noise design and an effective ventilation system. It supports the smart fan technology that automatically controls the speed of the built-in fan to reduce noise and maintain the temperature of the PoE switch for optimal power output capability. The GS-4210-16UP4C is able to operate reliably, stably and quietly in any environment without affecting its performance.

IPv6/IPv4 Dual Stack Management

Supporting both IPv6 and IPv4 protocols, the GS-4210-16UP4C 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 GS-4210-16UP4C 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 GS-4210-16UP4C allows the operation of a high-speed trunk to combine with multiple ports, 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 GS-4210-16UP4C 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

PLANET GS-4210-16UP4C 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 GS-4210-16UP4C 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 construct highly-secure corporate networks with considerably less time and effort than before.

Friendly and Secure Management

For efficient management, the GS-4210-16UP4C is equipped with **web**, **Telnet** and **SNMP** management interfaces. With the built-in web-based management interface, the GS-4210-16UP4C offers an easy-to-use, platform-independent management and configuration facility. By supporting the standard SNMP, the switch can be managed via any standard management software. For text-based management, the switch can be accessed via Telnet. Moreover, the GS-4210-16UP4C 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 four mini-GBIC slots built in the GS-4210-16UP4C support SFP auto-detection and dual speed as it features **100BASE-FX** and **1000BASE-SX/LX SFP** (Small Form-factor Pluggable) fiber transceivers 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 above 10/20/30/40/50/70/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications within the enterprise data centers and distributions.

Intelligent SFP Diagnosis Mechanism

The GS-4210-16UP4C 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.

2. PRODUCT FEATURES

- **Physical Port**
  - **20 10/100/1000BASE-T** Gigabit RJ45 copper ports with 16-Port **IEEE 802.3at/af/Ultra PoE** injector
  - **4 100/1000BASE-X mini-GBIC/SFP** slots, shared with port-17 to port-20 compatible with 100BASE-FX SFP
  - RJ45 console interface for switch basic management and setup

- **Power over Ethernet**
  - Complies with IEEE 802.3at Power over Ethernet Plus, end-span/mid-span PSE
  - Backward compatible with IEEE 802.3af Power over Ethernet
  - Up to 16 ports of IEEE 802.3af/IEEE 802.3at/Ultra PoE devices powered
  - Supports PoE power up to 60 watts for each ultra PoE port
  - Auto detects powered device (PD)
  - Circuit protection prevents power interference between ports
  - Remote power feeding up to 100 meters
  - PoE management
    - Total PoE power budget control
    - Per port PoE function enable/disable
    - PoE port power feeding priority
    - Per PoE port power limitation
    - PD classification detection
    - 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 Store and Forward architecture, broadcast storm control, and runt/CRC filtering that eliminates erroneous packets to optimize the network bandwidth
  - Supports **VLAN**
    - IEEE 802.1Q tagged VLAN
    - Provider Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
    - Protocol VLAN
    - Voice VLAN
    - Private VLAN
    - Management VLAN
    - GVRP

- Supports **Spanning Tree Protocol**
  - STP (Spanning Tree Protocol)
  - RSTP (Rapid Spanning Tree Protocol)
  - MSTP (Multiple Spanning Tree Protocol)
  - STP BPDU Guard, BPDU filtering and BPDU forwarding
- Supports **Link Aggregation**
  - IEEE 802.3ad Link Aggregation Control Protocol (LACP)
  - Cisco ether-channel (static trunk)
- Provides port mirror (many-to-1)
- Loop protection to avoid broadcast loops

Quality of Service

- Ingress and egress rate limit per port bandwidth control
- Storm control support
  - Broadcast/Unknown unicast/Unknown multicast
- Traffic classification
  - IEEE 802.1p CoS
  - TOS/DSCP/IP precedence of IPv4/IPv6 packets
- Strict priority and Weighted Round Robin (WRR) CoS policies

Multicast

- Supports IPv4 IGMP snooping v2 and v3
- Supports IPv6 MLD snooping v1, v2
- IGMP querier mode support
- IGMP snooping port filtering
- MLD snooping port filtering

Security

- Authentication
  - IEEE 802.1X port-based network access authentication
  - Built-in RADIUS client to cooperate with the RADIUS servers
  - RADIUS/TACACS+ login user access authentication
- Access control list
  - IPv4/IPv6 IP-based ACL
  - MAC-based ACL
- MAC security
  - Static MAC
  - MAC filtering
- Port security for source MAC address entries filtering
- DHCP snooping to filter distrusted DHCP messages
- Dynamic ARP Inspection discards ARP packets with invalid MAC address to IP address binding
- IP source guard prevents IP spoofing attacks

- DoS attack prevention
- SSH/SSL

Management

- IPv4 and IPv6 dual stack management
- Switch management interface
  - Web switch management
  - Telnet command line interface
  - SNMP v1, v2c and v3
  - SSH and SSL secure access
- User privilege levels control
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- System maintenance
  - Firmware upload/download via HTTP/TFTP
  - Configuration upload/download through web interface
  - Dual images
  - Hardware reset button for system reboot or reset to factory default
- SNTP Network Time Protocol
- Cable diagnostics
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- SNMP trap for interface link up and link down notification
- Event message logging to remote Syslog server
- Four RMON groups (history, statistics, alarms and events)
- PLANET smart discovery utility
- Smart fan with speed control

3. PRODUCT SPECIFICATIONS

3.1 MAIN COMPONENTS

Switch ASIC:	Realtek RTL8382M	x 1
Giga PHY:	Realtek RTL8218B	x 1
Combo PHY:	Realtek RTL8214FC	x 1
Flash:	16M bytes	x 1
DDR RAM:	128M bytes	x 1
PoE Chip:	Power Design PD69200	x 1
	Power Design PD69208	x 4
Open Frame Power Supply:	UMEC Power Supply	x 1
	Output: 12V DC, 5A; 54V DC, 8.52A	

3.2 FUNCTION SPECIFICATIONS

Product	**GS-4210-16UP4C**
Hardware Specifications	
Copper Ports	20 x 10/100/1000BASE-T RJ45 auto-MDI/MDI-X port
SFP/mini-GBIC Slots	4 x 100/1000BASE-X SFP interface shared with port-17 to port-20 Supports 100/1000Mbps dual mode and DDM
PoE Injector Port	16 ports with 802.3at/af/Ultra PoE injector function with port-1 to port-16
Switch Architecture	Store-and-Forward
Switch Fabric	40Gbps/non-blocking
Switch Throughput@64Bytes	29.7Mpps
Address Table	8K entries
Shared Data Buffer	4.1 megabits
Flow Control	IEEE 802.3x pause frame for full-duplex Back pressure for half-duplex
Jumbo Frame	10K bytes
Reset Button	< 5 sec: System reboot > 5 sec: Factory default
LED	PWR, SYS, LNK/ACT, PoE-in-use, 1000, FAN1, FAN2, PoE PWR
Power Requirements	100~240V AC, 50/60Hz, auto-sensing
Dimensions (W x D x H)	440 x 300 x 44.5 mm, 1U height
ESD Protection	4kV Contact Discharge 8kV Air Discharge
Enclosure	Metal
Weight	4479g

Power Consumption/Dissipation	500 watts (max.)/1706 BTU
Fan	3 x smart fan
Power over Ethernet	
PoE Standard	IEEE 802.3af/802.3at/Ultra PoE PSE
PoE Power Supply Type	End-span/Mid-span/UPoE
PoE Power Output	Per port 54V DC, 60 watts (max.)
Power Pin Assignment	End-span: 1/2(-), 3/6(+) Mid-span: 4/5(+), 7/8(-) UPoE: 1/2(-), 3/6(+),4/5(+), 7/8(-)
PoE Power Budget	400 watts (max.)
PoE Ability PD @ 15 watts	16 units
PoE Ability PD @ 30 watts	13 units
PoE Ability PD @ 60 watts	6 units
Layer 2 Functions	
Port Mirroring	TX/RX/both Many-to-1 monitor
VLAN	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
Link Aggregation	IEEE 802.3ad LACP and static trunk Supports 4 groups of 4-port 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)
IGMP Snooping	IGMP (v2/v3) snooping IGMP querier Up to 256 multicast groups
MLD Snooping	MLD (v1/v2) snooping, up to 256 multicast groups
Access Control List	IPv4/IPv6 IP-based ACL/MAC-based ACL
QoS	8 mapping IDs 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

Security	IEEE 802.1X port-based authentication Built-in RADIUS client to cooperate with RADIUS server RADIUS/TACACS+ user access authentication IP-MAC port binding MAC filtering Static MAC address DHCP Snooping and DHCP Option82 STP BPDU guard, BPDU filtering and BPDU forwarding DoS attack prevention ARP inspection IP source guard
Management Functions	
Basic Management Interfaces	Web browser; Telnet; SNMP v1, v2c Firmware upgrade by HTTP/TFTP Protocol through Ethernet network Remote/Local syslog System log LLDP Protocol SNTP
Secure Management Interfaces	SSH, SSL, SNMP v3
SNMP MIBs	RFC 1213 MIB-II RFC 1215 Generic Traps RFC 1493 Bridge MIB RFC 2674 Bridge MIB Extensions RFC 2737 Entity MIB (v2) RFC 2819 RMON (1, 2, 3, 9) RFC 2863 Interface Group MIB RFC 3635 Ethernet-like MIB
Standards Conformance	
Regulatory Compliance	FCC Part 15 Class A, CE, LVD
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 802.3x 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
Environment	
Operating	Temperature: 0 ~ 50 degrees C Relative Humidity: 5 ~ 95% (non-condensing)
Storage	Temperature: -20 ~ 70 degrees C Relative Humidity: 5 ~ 95% (non-condensing)

3.3 PHYSICAL SPECIFICATIONS:

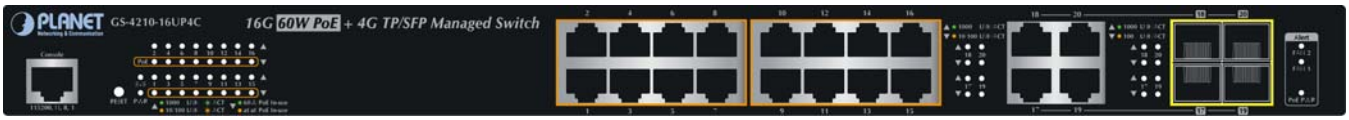
Dimensions:

440 x 300 x 44.5 mm (W x D x H), 1U height

Weight:

4479g

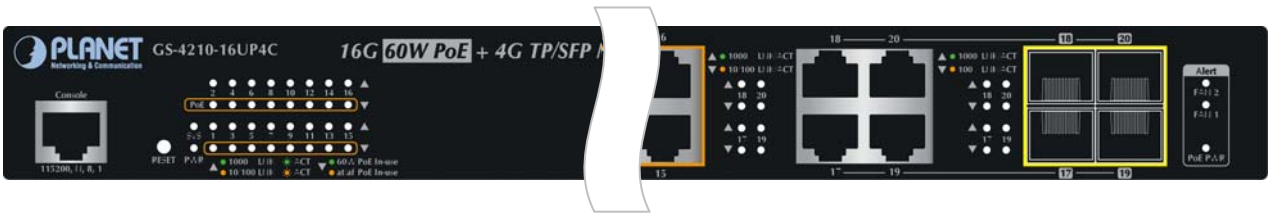
■ **Front Panel:**



■ **Rear Panel:**

■ **LED Definition**

GS-4210-16UP4C:



System Alert

LED	Color	Function
PWR	**Green**	**Lights** to indicate that the Switch has power.
SYS	**Green**	**Lights** to indicate the system is working. **Off** to indicate the system is booting.
FAN 1	**Red**	**Lights** to indicate that FAN1 is down.
FAN 2	**Red**	**Lights** to indicate that FAN2 is down.
PoE PWR	**Red**	**Lights** to indicate that the PoE power is down.

10/100/1000BASE-T Interfaces (Port-1 to Port-16)

LED	Color	Function
Ethernet	**Green**	**Lights**: To indicate that the port is operating at 1000Mbps. **Blinks:** To indicate that the switch is actively sending or receiving data over that port.
	Orange	**Lights**: To indicate that the port is operating at 10/100Mbps. **Blinks:** To indicate that the switch is actively sending or receiving data over that port.
PoE	**Green**	**Lights**: To indicate the port is providing DC in-line power with Ultra PoE mode. **Off:** To indicate the connected device is not a PoE powered device (PD)
	Orange	**Lights**: To indicate the port is providing DC in-line power with end-span/mid-span mode. **Off:** To indicate the connected device is not a PoE powered device (PD).

10/100/1000BASE-T Interfaces (Port-17 to Port-20)

LED	Color	Function
1000	**Green**	**Lights**: To indicate that the port is operating at 1000Mbps. **Blinks:** To indicate that the switch is actively sending or receiving data over that port.
10/100	**Orange**	**Lights**: To indicate that the port is operating at 10/100Mbps. **Blinks:** To indicate that the switch is actively sending or receiving data over that port.

100/1000BASE-SX/LX SFP Interfaces (Port-17 to Port-20)

LED	Color	Function
1000	**Green**	**Lights**: To indicate that the port is operating at 1000Mbps. **Blinks:** To indicate that the switch is actively sending or receiving data over that port.
100	**Orange**	**Lights**: To indicate that the port is operating at 100Mbps. **Blinks:** To indicate that the switch is actively sending or receiving data over that port.

3.4 ENVIRONMENTAL SPECIFICATIONS

Operating:

Temperature: 0°C ~ 50 degrees C

Relative Humidity: 20% ~ 95% (non-condensing)

Storage:

Temperature: -20°C ~ 70 degrees C

Relative Humidity: 20% ~ 95% (non-condensing)

3.5 ELECTRICAL SPECIFICATIONS

Model		**GS-4210-16UP4C**
AC Power Input Voltage:		100 ~ 240VAC, 50/60Hz, auto-sensing.
Power Consumption (System on):	110V	**20** watts/68 BTU
	220V	**20** watts/68 BTU
Power Consumption (Ethernet Full Load Steady):	110V	**27** watts/92 BTU
	220V	**26** watts/89 BTU
Power Consumption (PoE Full Loading):	110V	**500** watts/1706 BTU
	220V	**490** watts/1672 BTU

3.6 TEMPERATURE DETECTION SPECIFICATIONS

GS-4210-16UP4C:

Smart Fan Speed Control

PoE Chip Temperature Value	**Status**
< 42 degrees C	Fan is in low speed
> 48 degrees C	Fan is in high speed

3.7 REGULATORY COMPLIANCE

FCC Class A, CE.

3.8 RELIABILITY

MTBF > 50,000 hrs @ 25 degrees C

3.9 BASIC PACKAGING

- GS-4210-16UP4C Switch x 1
- Quick Installation Guide x 1
- Power Cord x 1
- RS-232 to RJ45 Cable x 1
- SFP Dust Cap x 4
- Two Rack-mounting Brackets with Attachment Screws x 2

3.10 PACKING DIMENSIONS

Dimensions:	520 (W) x 450 (D) x 90 mm (H)
Weight:	TBD KG (gross weight)
Quantity:	2pcs in one carton