Product Specifications

L2+ 16-Port 10/100/1000BASE-T 802.3at PoE +
4-Port Gigabit TP/SFP Combo Managed Switch

WGSW-20160HP

Version 2.0

Change History:

Revision:	Date:	Author:	Change List
Version 2.0	2019/3/4	Marc Liao	1. NOR Flash upgrade from 16MB to 64MB 2. Operating System changed from eCOS to Linux platform 3. Software function enhance
Version 1.0	2013/1/22	Marc Liao	Initial Release

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1. PRODUCT DESCRIPTION

Cost-effective IPv6 Managed Gigabit Switch Solution for Enterprises

PLANET WGSW-20160HP is a Layer 2+ managed Gigabit PoE Switch that features PLANET intelligent PoE functions to improve the availability of critical business applications. The WGSW-20160HP comes with **16 10/100/1000BASE-T ports** with each port featuring **30-watt 802.3at PoE+**, and **4 extra Gigabit TP/SFP combo interfaces**. It provides IPv6/IPv4 management and built-in L2/L4 Gigabit Switching engine, and supports high-speed transmission of surveillance images and videos. With a total power budget of up to 230W for different kinds of PoE applications, the WGSW-20160HP provides quick, safe and cost-effective Power over Ethernet network solutions to security IP surveillance for small businesses and enterprises.

Cybersecurity Network Solution to Minimize Security Risks

The new-generation WGSW-20160HP has the cybersecurity feature to prevent mission-critical networks from cyberattacks so as to enhance their overall security without any deployment cost and effort. The new WGSW-20160HP has its memory on hardware expanded and the kernels of SSH,TLS and SSL protocols upgraded to provide strong protection against advanced threats. It includes such cybersecurity features as DHCP Snooping, IP Source Guard, ARP Inspection Protection, 802.1x port-based and MAC-based network access control, RADIUS and TACACS+ user accounts management, SNMPv3 authentication, and so on to complement it as an all-security solution. The network administrator can now construct highly-secure corporate networks with considerably less time and effort than before.

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 WGSW-20160HP 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 the switch series, making the deployments of surveillance and other devices easy for planning and inspection purposes. Moreover, clients can get real-time surveillance's information and online/offline status. They allow PoE reboot control from the GUI.

Built-in Unique PoE Functions for Powered Devices Management

Being the managed PoE switches for surveillance, wireless and VoIP networks, the WGSW-20160HP feature the following special PoE management functions:

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

Intelligent Powered Device Alive Check

The WGSW-20160HP can be configured to monitor connected PD (powered device) status in real time via ping action. Once the PD stops working and responding, the WGSW-20160HP will resume the PoE port power and bring the PD back to work. They 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 WGSW-20160HP allows each of the connected PoE IP cameras or PoE wireless access points to reboot at a specified time each week. Therefore, they 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 WGSW-20160HP can effectively control the power supply besides their 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 WGSW-20160HP enables the administrator to monitor the status of the power usage of the connected PDs in real time. Thus, they greatly enhance the management efficiency of the facilities.

Solution for IPv6 Networking

By supporting IPv6/IPv4 dual stack and plenty of management functions with easy and friendly management interfaces, the WGSW-20160HP is the best choice for IP surveillance, VoIP and wireless service providers to connect with the IPv6 network. It also helps the SMB to step in the IPv6 era with the lowest investment but not necessary to replace the network facilities while the ISP constructs the IPv6 FTTx edge network.

IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

To help customers stay on top of their businesses, the WGSW-20160HP not only provides ultra high transmission performance and excellent Layer 2 technologies, but also offers IPv4/IPv6 VLAN routing feature which allows to cross over different VLANs and different IP addresses for the purpose of having a highly-secure, flexible management and simpler networking application.

Robust Layer 2 Features

The WGSW-20160HP 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 WGSW-20160HP allows the operation of a high-speed trunk combining multiple ports. It enables up to 10 trunk groups with 4 ports per trunk group and supports connection fail-over as well.

Powerful Security

The WGSW-20160HP offers comprehensive **Layer 2 to Layer 4 access control list (ACL)** for enforcing security to the edge. It can be used to restrict to 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 WGSW-20160HP 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 construct highly-secure corporate networks with considerably less time and effort than before.

User-friendly Secure Management

For efficient management, the WGSW-20160HP managed switch is equipped with console, web and SNMP management interfaces. With the built-in web-based management interface, the WGSW-20160HP offers an easy-to-use, platform-independent management and configuration facility. The WGSW-20160HP supports SNMP and it can be managed via any management software based on standard of SNMP v1 and v2 protocol. For reducing product learning time, the WGSW-20160HP offers Cisco-like command via Telnet or console port and customer doesn't need to learn new command from these switches. Moreover, the WGSW-20160HP offers remote secure management by supporting **SSH**, **SSL** and **SNMPv3** connection which can encrypt the packet content at each session.

Flexible and Extendable Solution

The 4 mini-GBIC SFP slots built in the WGSW-20160HP support dual speed as it features 100BASE-FX and 1000BASE-SX/LX SFP (Small Form-factor Pluggable) fiber-optic modules. Now the administrator can flexibly choose the suitable SFP transceiver according to not only the transmission distance, but also the transmission speed required. 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 WGSW-20160HP 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.

2. PRODUCT FEATURES

➢ **Physical Port**

- **16-port 10/100/1000BASE-T** RJ45 copper
- **4 10/100/1000Mbps TP and SFP shared combo interfaces,** SFP (mini-GBIC) supports 100/1000Mbps dual mode, shared with Port-17 to Port-20
- RS232 DB9 console interface for basic management and setup

➢ **Power over Ethernet**

- Complies with IEEE 802.3at Power over Ethernet Plus end-span PSE
- Complies with IEEE 802.3af Power over Ethernet end-span PSE
- Up to 16 ports of IEEE 802.3at/802.3af devices powered
- Supports PoE power up to 30.8 watts for each PoE port
- Auto detects powered device (PD)
- Circuit protection prevents power interference between ports
- Remote power feeding up to 100m
- PoE Management
  - Total PoE power budget control
  - Per port PoE function enable/disable
  - PoE Port Power feeding priority
  - Per PoE port power limit
  - PD classification detection
  - PD alive check
  - PoE schedule
  - PD scheduled power recycling

➢ **Layer 2 Features**

- Storm Control support
  - Broadcast / Multicast / Unknown unicast
- Supports **VLAN**
  - IEEE 802.1Q tagged VLAN
  - Up to 255 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
  - 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 10 trunk groups, up to 4 ports per trunk group
  - Up to 8Gbps bandwidth (full duplex mode)
- Provides port mirroring (many-to-1)
- Port mirroring to monitor the incoming or outgoing traffic on a particular port

- Loop protection to avoid broadcast loops
- 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.

➢ **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 policies 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 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
  - Console / Telnet Command Line Interface
  - Web switch management
  - SNMP v1, v2c, and v3 switch management
  - SSH, TLS and SSL secure access
- **IPv6** IP Address, NTP and 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
- DHCP Server
- 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 Link Up and Link Down notification
- System Log
- PLANET Smart Discovery Utility for deployment management

3. PRODUCT SPECIFICATIONS

3.1 MAIN COMPONENTS

Switch ASIC:	VITESSE VSC7426	x 1
Gigabit PHY:	VITESSE VSC8504	x 2
CPU:	MIPS 416MHz (integrated with VSC7426)	x 1
Flash:	MXIC MX25L1284SEMI-10G (128M-bit)	x 1
DDR RAM:	D9LHQ (128Mb)	x 1
PoE Controller:	Power Design PD69008	x 2
System AC-DC Open frame power supply	L.T.E LTE45FS-S2	x 1
PoE Power Supply	UMEC A250S3	x 1

3.2 FUNCTION SPECIFICATIONS

Product	**WGSW-20160HP**
Hardware Specifications	
Hardware Version	2
Copper Ports	16 10/ 100/1000BASE-T RJ45 auto-MDI/MDI-X ports
10/100/1000Mbps / SFP Combo Interfaces	4 10/100/1000Mbps TP and SFP shared combo interfaces, SFP (mini-GBIC) supports 100/1000Mbps dual mode DDM, shared with Port-17 to Port-20
Console	1 x DB9 RS232 serial port (115200, 8, N, 1)
Switch Architecture	Store-and-Forward
Switch Fabric	40Gbps / non-blocking
Throughput	29.7Mpps@64Bytes
Address Table	8K entries, automatic source address learning and aging
Shared Data Buffer	4 megabits
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
Jumbo Frame	9K bytes
Reset Button	< 5 sec: System reboot > 5 sec: Factory Default
LED	System: Power (Green), SYS (System, Green) Alert: FAN1 (Green), FAN2 (Green) PoE Ethernet Interfaces (Port 1 to Port 16): LNK/ACT (10/100/1000Mbps, Green), PoE In-Use (Orange) 10/100/1000BASE-T Combo Ports (Port 17 to port 20): 1000 (LNK/ACT, Green), 10/100 (LNK/ACT, Orange)

	100/1000Mbps SFP Combo Interfaces (Port 17 to Port 20): 1000 (LNK/ACT, Green), 100 (LNK/ACT, Orange)
Power Requirements	100~240V AC, 50/60Hz, 2A
Power Consumption (Full Loading)	252 watts/860BTU
ESD Protection	6KV DC
Dimensions (W x D x H)	440 x 300 x 44.5 mm, 1U high
Weight	4.1 kg
Power over Ethernet Specifications	
PoE Standard	IEEE 802.3at Power over Ethernet Plus PSE
PoE Power Supply Type	End-span
PoE Power Output	Per port 56V DC, 590mA. max. 30.8 watts
Power Pin Assignment	1/2(+), 3/6(-)
PoE Power Budget	230 watts max. @25 degrees C 190 watts max. @50 degrees C
Number of PDs, 7 watts	16 units
Number of PDs, 15.4 watts	14 units
Number of PDs, 30 watts	7 units
Layer 2 Function	
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 tag-based VLAN, up to 255 VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN MVR (Multicast VLAN Registration) GVRP (GARP VLAN Registration Protocol) Up to 255 VLAN groups, out of 4094 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP / static trunk Supports 10 trunks groups with 4 ports per trunk group
Spanning Tree Protocol	IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol
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 Snooping (v1/v2/v3), up to 255 multicast groups IPv4 IGMP Querier mode support
MLD Snooping	IPv6 MLD Snooping ((v1/v2), up to 255 multicast groups IPv6 MLD Querier mode support
Bandwidth Control	Per port bandwidth control Ingress: 500Kb~80Mbps Egress: 64Kb~80Mbps
Access Control List	IP-based ACL / MAC-based ACL Up to 256 entries
Security	IEEE 802.1X – Port-based and MAC-based authentication Built-in RADIUS client to cooperate with RADIUS server RADIUS/TACACS+ user access authentication Port Security DHCP Snooping and DHCP Option82 STP BPDU guard, BPDU filtering and BPDU forwarding DoS attack prevention ARP inspection IP source guard
Layer 3 Function	
IP Interface	Max. 8 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 software static routing IPv6 software static routing
Management Function	
Basic Management Interfaces	Console; Telnet; Web Browser; SNMP v1, v2c
Secure Management Interfaces	SSH, TLS, SSL, SNMP v3
SNMP MIBs	RFC 1213 MIB-II IF-MIB RFC 1493 Bridge MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2737 Entity MIB RFC 2819 RMON MIB (Group 1, 2, 3 and 9) RFC 2618 RADIUS Client MIB RFC 3411 SNMP-Frameworks-MIB IEEE 802.1X PAE LLDP MAU-MIB
Standards Conformance	
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3z 1000BASE-SX/LX IEEE 802.3ab 1000BASE-T

	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 version 1 RFC 2236 IGMP version 2 RFC 3376 IGMP version 3 RFC 2710 MLD version 1 FRC 3810 MLD version 2

3.3 PHYSICAL SPECIFICATIONS:

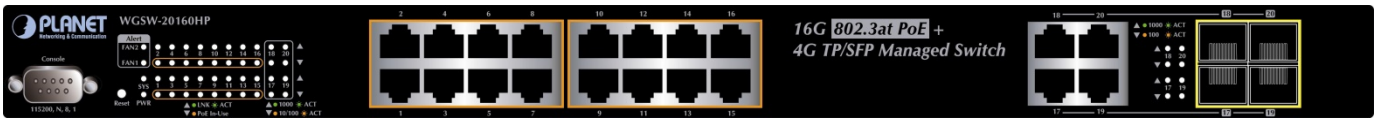
- **Dimensions:**

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

- **Weight:**

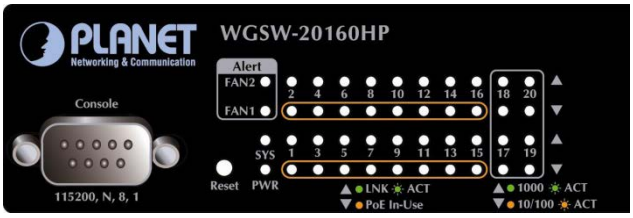
  4.1kg

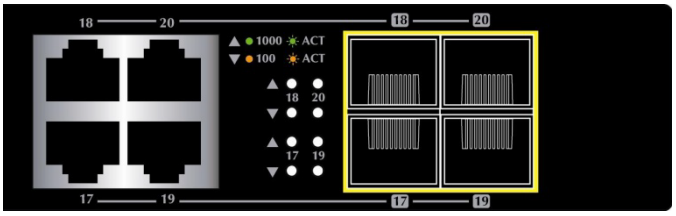
- **Front Panel:**



- **Rear Panel:**

■ LED Definition





■ System

LED	Color	Function
PWR	**Green**	Lights to indicate that the Switch has power.
SYS	**Green**	Lights to indicate the system is working.

■ Alert

LED	Color	Function
FAN1	**Green**	**Lights** to indicate that the FAN1 failure.
FAN2	**Green**	**Lights** to indicate that the FAN2 failure.

■ Per 10/100/1000Mbps port with PoE interfaces (Port-1 to Port-16)

LED	Color	Function
LNK/ACT	**Green**	**Lights:** To indicate the link through that port is successfully established at 10/100/1000Mbps. **Blinking:** To indicate that the Switch is actively sending or receiving data over that port.
PoE-in-Use	**Orange**	**Lights**: To indicate the port is providing 56V DC in-line power. **Off**: To indicate the connected device is not a PoE Powered Device (PD).

■ Per 10/100/1000BASE-T Combo Port (Port -17 to Port-20)

LED	Color	Function
1000 LNK/ACT	**Green**	**Lights:** To indicate the link through that port is successfully established at 1000Mbps. **Blink:** To indicate that the Switch is actively sending or receiving data over that port.
10 / 100 LNK / ACT	**Orange**	**Lights**: To indicate the link through that port is successfully established at 10Mbps or 100Mbps. **Blink:** To indicate that the Switch is actively sending or receiving data over that port.

■ Per 100/1000Mbps SFP Combo Interface (Port -17 to Port-20)

LED	Color	Function	
1000 LNK/ACT	**Green**	**Lights**.	To indicate the port is successfully established at 1000Mbps.
		Blink:	To indicate that the Switch is actively sending or receiving data over that port.
100 LNK/ACT	**Orange**	**Lights**:	To indicate the port is successfully established at 100Mbps.
		Blink:	To indicate that the Switch is actively sending or receiving data over that port.

3.4 ENVIRONMENTAL SPECIFICATIONS

Operating:

Temperature: 0 ~ 50 degrees C

Relative Humidity: 5% ~ 95% (non-condensing)

Storage:

Temperature: -10 ~ 70 degrees C

Relative Humidity: 5% ~ 95% (non-condensing)

3.5 ELECTRICAL SPECIFICATIONS

Input Voltage:	100~240V AC, 50/60Hz,2A (max.) Auto-sensing	
Power Consumption (System on):	110V: 14 watts	47 BTU
	220V: 14 watts	47 BTU
Power Consumption (Ethernet Full Loading):	110V: 22 watts	75 BTU
	220V: 22 watts	75 BTU
Power Consumption (PoE+ Ethernet Full Loading):	110V: 240 watts *	818 BTU
	220V: 230 watts *	784BTU

* With a total PoE power output limited at 230 watts

3.6 REGULATORY COMPLIANCE

FCC Part 15 Class A, CE

3.7 RELIABILITY

MTBF > 50,000 hrs @ 25 degrees C

3.8 BASIC PACKAGING

☑ **The WGSW-20160HP** x 1

☑ **Quick Installation Guide** x 1

☑ **RS-232 DB9 Male Console Cable** x 1

☑ **Power Cord** x 1

☑ **SFP Dust Cap** x 4

☑ **Rubber Feet** x 4

☑ **Rack Mount Accessory Kit** x 1

3.9 PACKING INFORMATION

Box Dimensions:	567 (W) x 392 (D) x 93 mm (H)
Carton Dimensions:	585 (W) x 206 (D) x 412 mm (H)
Weight:	5.06kg (gross weight)
Units per Carton:	2pcs