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



## 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.



Console    Reset Button    16 x Gigabit 802.3at poE Ports    4 Gigabit TP/SFP Combo
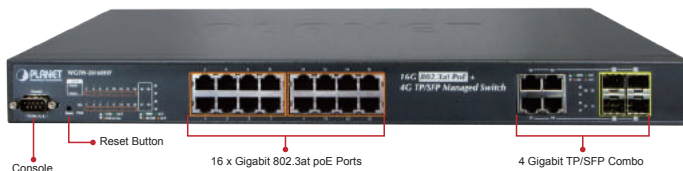
## Cybersecurity Network Solution to Minimize Security Risks

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.



## 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 power recycling schedule

## 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)

## 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.
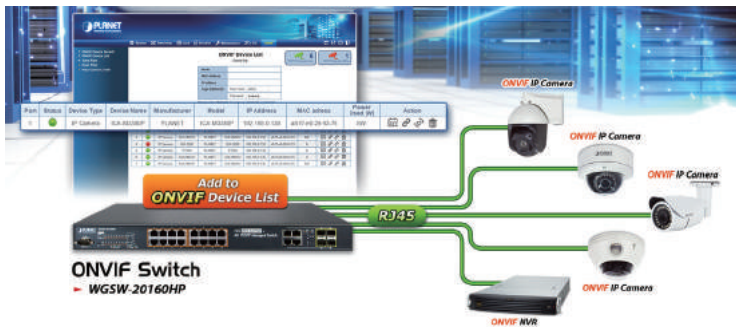




## Built-in Unique PoE Functions for Powered Devices Management

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.
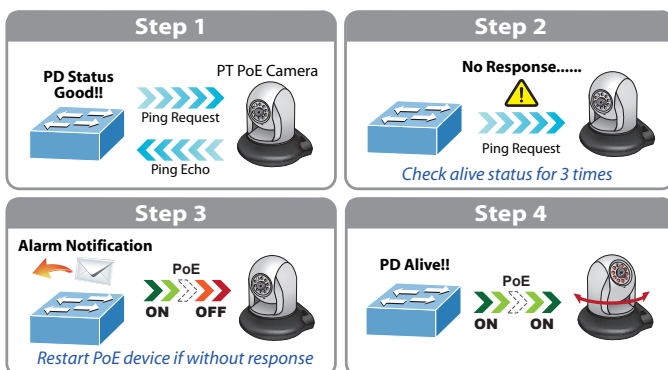


- Supports Spanning Tree Protocol
  - IEEE 802.1D Spanning Tree Protocol (STP)
  - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP), spanning tree by VLAN
  - BPDU Guard
- Supports **Link Aggregation**
  - 802.3ad Link Aggregation Control Protocol (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

## 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.
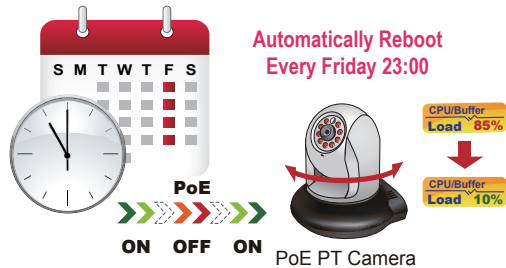


## PoE Schedule for Energy Saving

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.
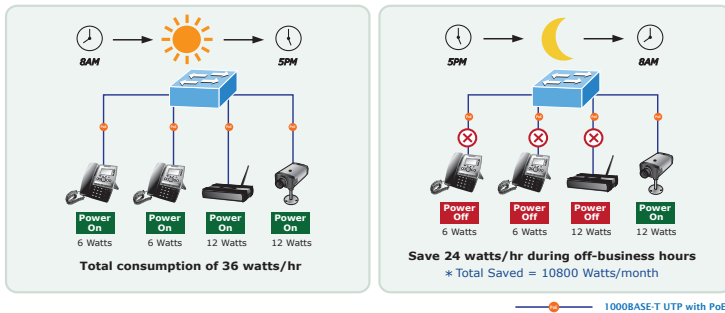


## PoE Usage Monitoring

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.
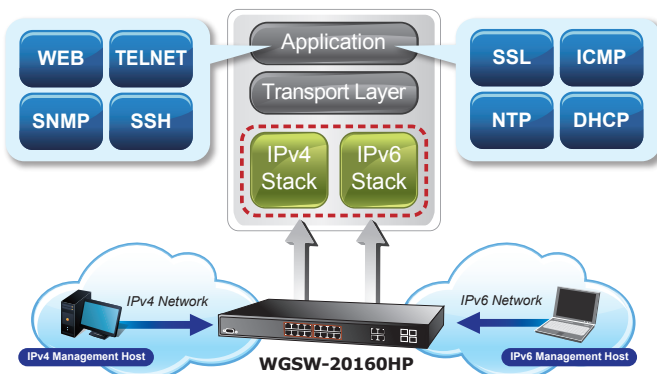


- Built-in RADIUS client to co-operate with the RADIUS servers
- TACACS+ login users access authentication
- RADIUS / TACACS+ users access authentication
- Access Control List
  - IP-based Access Control List (ACL)
  - MAC-based Access Control List
- Source MAC / IP address binding
- **DHCP Snooping** 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 deploy management

*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.

L2/L4
Managed Switch

L2/L4
Managed Switch
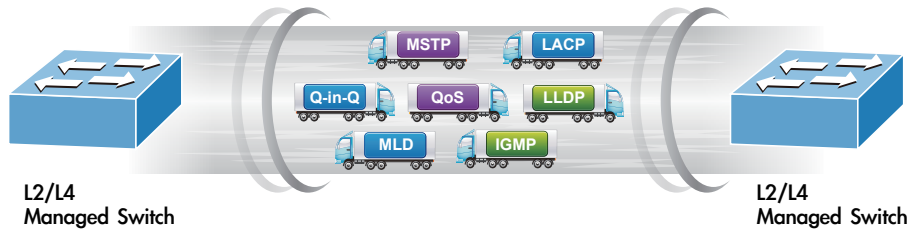
*Powerful Security*

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.

Computer

**WGSW-20160HP**

Secure Management

SSL    SSH    SNMPv3

*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.

4

## 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.
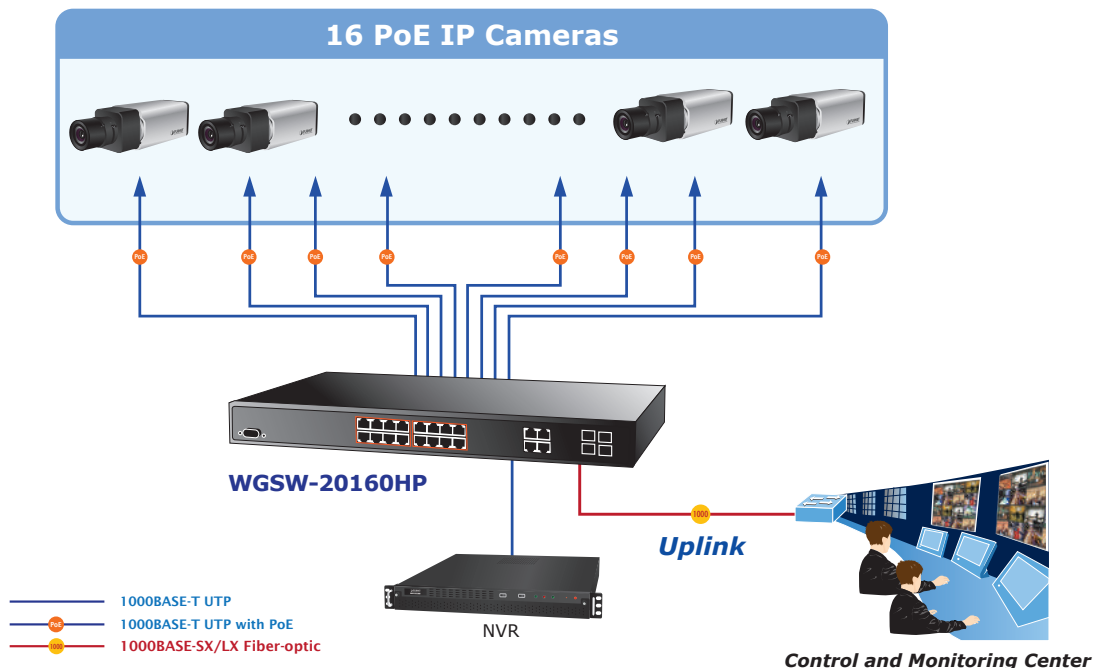
# Digital Diagnostic Monitor *(DDM)*
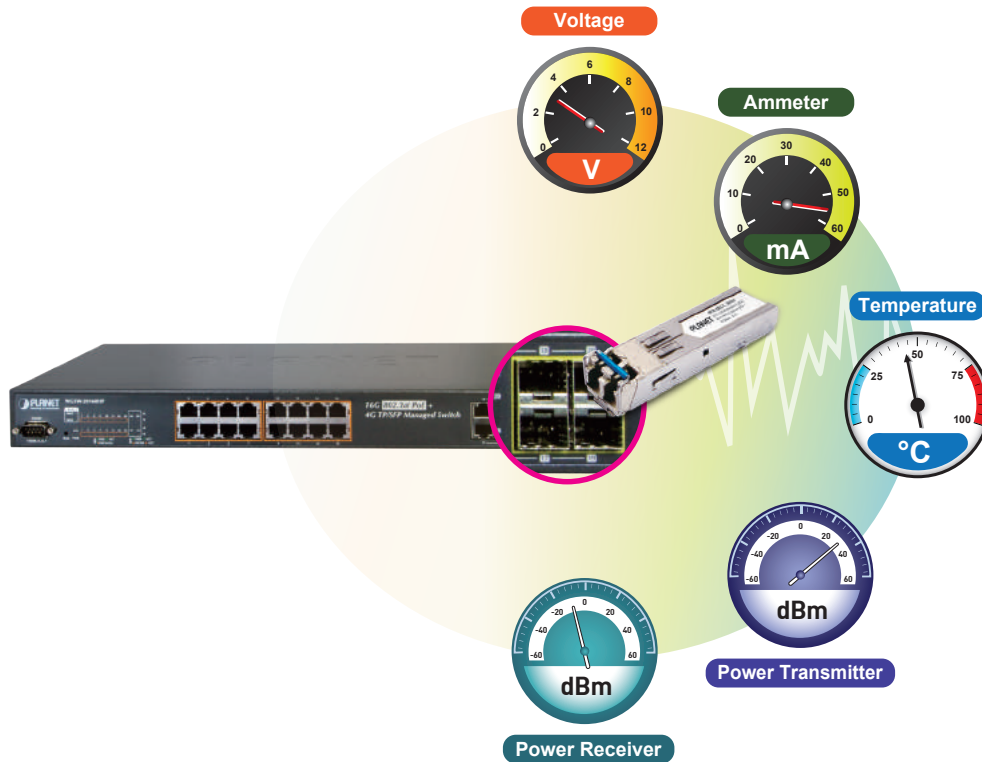


# Applications

### Perfect Integration Solution for IP PoE Camera and NVR System

The WGSW-20160HP brings an ideal secure surveillance system at a lower total cost. It provides 16 10/100/1000Mbps 802.3at PoE ports with 4 Gigabit TP/ SFP Combo interfaces, offering sufficient PoE power for a maximum of 16 IEEE 802.3af/at PoE IP cameras at the same time. With 4 Gigabit TP/SFP Combo interfaces, the WGSW-20160HP supports connection to two 8-channel NVR systems to receive stream from 16 IP cameras and also to backbone switch from an uplink port, and then access to control center. With its high performance switch architecture, the recorded video files from the 16 IEEE 802.3af/at PoE IP cameras can be saved in the NVR systems, which can be controlled and monitored both in the local LAN and the remote site via Internet.



1000BASE-T UTP
1000BASE-T UTP with PoE
1000BASE-SX/LX Fiber-optic

**WGSW-20160HP**

NVR

*Uplink*
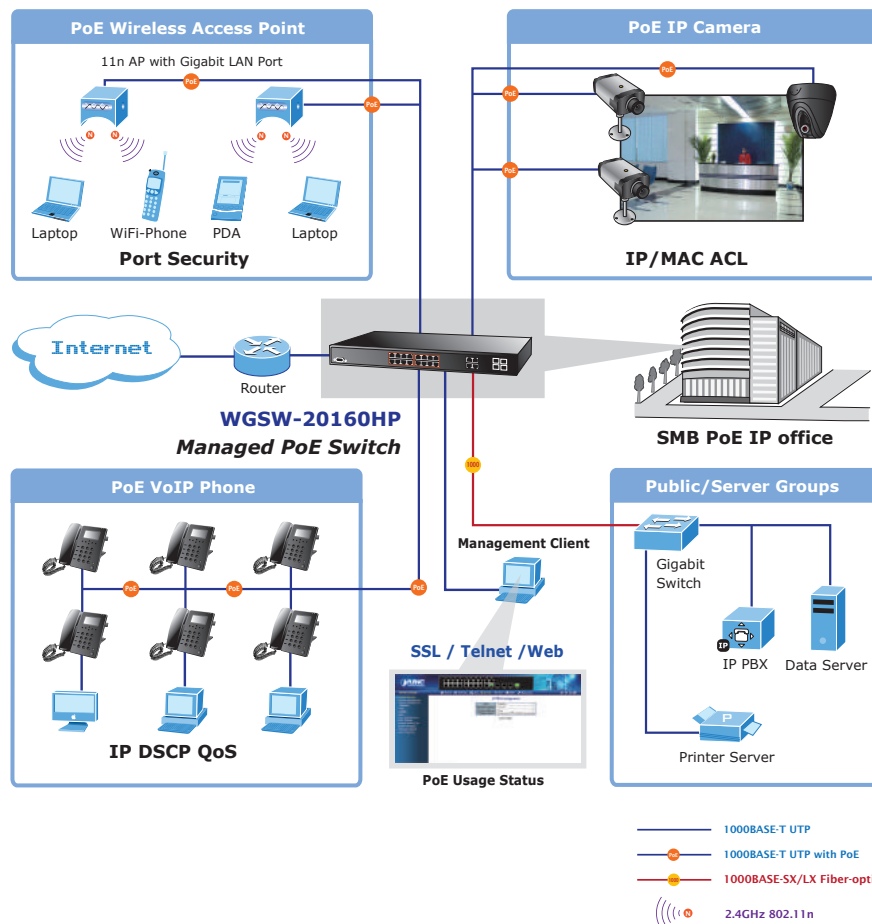
*Control and Monitoring Center*

5

## IP Office Department/Workgroup PoE Switch

As the business expands, the additional telephones required could be installed at less cost via the implementation of PoE IP telephony system than that of the traditional circuit wiring telephony system. The WGSW-20160HP helps enterprises to efficiently create an integrated data, voice, and powered VoIP network. Any IEEE 802.3af/at compliant IP phones can be installed without any power cable because it can be powered via the standard Ethernet cable from the connected WGSW-20160HP.  With the WGSW-20160HP, IP telephony deployment becomes more reliable and cost effective, which helps enterprises save tremendous cost when upgrading from the traditional telephony system to IP telephony communications infrastructure.
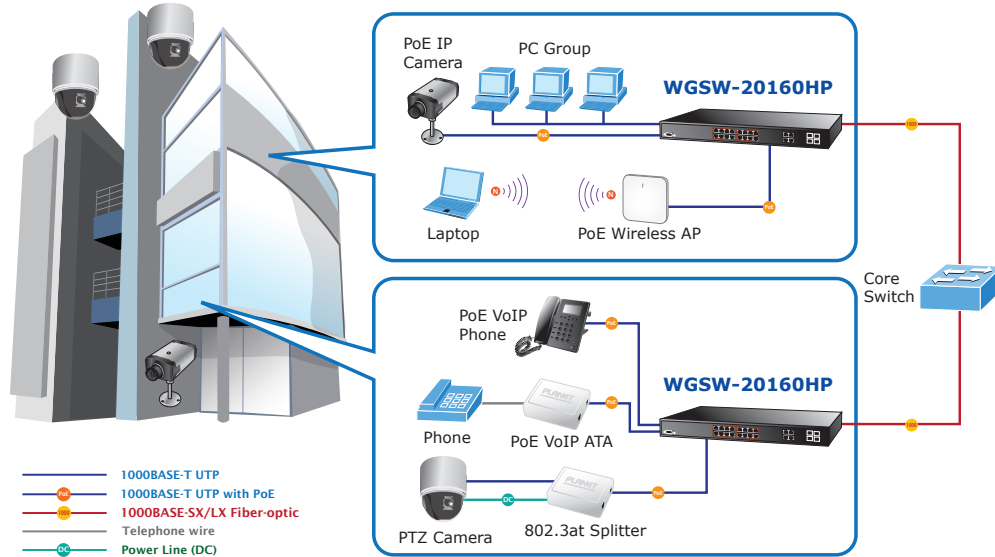


## IP Office Backbone PoE Switch

Providing up to 16 PoE, in-line power interfaces and 4 Gigabit TP/SFP combo interfaces, the WGSW-20160HP can easily build an IP phone system, IP camera system, or wireless AP group for the enterprises in which power can be centrally controlled. For instance, IP cameras or wireless APs can be easily installed in the company for surveillance demands or building a wireless roaming environment in the office. Without the power socket limitation, the WGSW-20160HP makes the deployment of IP cameras or wireless LAN AP easier and more efficient. The 4 Gigabit TP/SFP combo interfaces in the WGSW-20160HP also offers flexible Gigabit TP or fiber connection for uplink to public server groups.

# 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 ageing |
| Shared Data Buffer | 4 megabits |
| Flow Control | IEEE 802.3x pause frame for full duplex<br>Back pressure for half duplex |
| Jumbo Frame | 9K bytes |
| Reset Button | < 5 sec: System reboot<br>> 5 sec: Factory Default |
| LED | System:<br>  Power (Green), SYS (System, Green)<br>Alert:<br>  FAN1 (Green), FAN2 (Green)<br>PoE Ethernet Interfaces (Port 1 to Port 16):<br>  LNK/ACT (10/100/1000Mbps, Green), PoE In-Use (Orange)<br>10/100/1000BASE-T Combo Ports (Port 17 to port 20):<br>  1000 (LNK/ACT, Green), 10/100 (LNK/ACT, Orange)<br>100/1000Mbps SFP Combo Interfaces (Port 17 to Port 20):<br>  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<br>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<br>Auto-negotiation 10/100/1000Mbps full and half duplex mode selection<br>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<br>Many-to-1 monitor |
| VLAN | 802.1Q tag-based VLAN, up to 255 VLAN groups<br>Q-in-Q tunneling<br>Private VLAN Edge (PVE)<br>MAC-based VLAN<br>Protocol-based VLAN<br>Voice VLAN<br>MVR (Multicast VLAN Registration)<br>GVRP (GARP VLAN Registration Protocol)<br>Up to 255 VLAN groups, out of 4094 VLAN IDs |
| Link Aggregation | IEEE 802.3ad LACP / static trunk<br>Supports 10 trunks groups with 4 ports per trunk group |
| Spanning Tree Protocol | IEEE 802.1D Spanning Tree Protocol<br>IEEE 802.1w Rapid Spanning Tree Protocol<br>IEEE 802.1s Multiple Spanning Tree Protocol |

| Link Aggregation | IEEE 802.3ad LACP / static trunk<br>Supports 10 trunks groups with 4 ports per trunk group |
| --- | --- |
| Spanning Tree Protocol | IEEE 802.1D Spanning Tree Protocol<br>IEEE 802.1w Rapid Spanning Tree Protocol<br>IEEE 802.1s Multiple Spanning Tree Protocol |
| QoS | Traffic classification based, strict priority and WRR<br>8-Level priority for switching<br>- Port Number<br>- 802.1p priority<br>- 802.1Q VLAN tag<br>- DSCP/TOS field in IP packet |
| Bandwidth Control | Per port bandwidth control<br>Ingress: 500Kb~80Mbps<br>Egress: 64Kb~80Mbps |
| Access Control List | IP-based ACL / MAC-based ACL<br>Up to 256 entries |
| Security | IEEE 802.1X – Port-based and MAC-based authentication<br>Built-in RADIUS client to cooperate with RADIUS server<br>RADIUS/TACACS+ user access authentication<br>Port Security<br>DHCP Snooping and DHCP Option82<br>STP BPDU guard, BPDU filtering and BPDU forwarding<br>DoS attack prevention<br>ARP inspection<br>IP source guard |

| Layer 3 Function | |
| --- | --- |
| IP Interface | Max. 8 VLAN interfaces |
| Routing Table | Max. 32 routing entries |
| Routing Protocols | IPv4 software static routing<br>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<br>IF-MIB<br>RFC 1493 Bridge MIB<br>RFC 1643 Ethernet MIB<br>RFC 2863 Interface MIB<br>RFC 2665 Ether-Like MIB<br>RFC 2737 Entity MIB<br>RFC 2819 RMON MIB (Group 1, 2, 3 and 9)<br>RFC 2618 RADIUS Client MIB<br>RFC 3411 SNMP-Frameworks-MIB<br>IEEE 802.1X PAE<br>LLDP<br>MAU-MIB |

| Standards Conformance | |
| --- | --- |
| Regulatory Compliance | FCC Part 15 Class A, CE |
| Standards Compliance | IEEE 802.3 10BASE-T<br>IEEE 802.3u 100BASE-TX/100BASE-FX<br>IEEE 802.3z 1000BASE-SX/LX<br>IEEE 802.3ab 1000BASE-T<br>IEEE 802.3x flow control and back pressure<br>IEEE 802.3ad port trunk with LACP<br>IEEE 802.1D Spanning Tree protocol<br>IEEE 802.1w Rapid Spanning Tree protocol<br>IEEE 802.1s Multiple Spanning Tree protocol<br>IEEE 802.1p Class of service<br>IEEE 802.1Q VLAN tagging<br>IEEE 802.1x Port Authentication Network Control<br><br>IEEE 802.3af Power over Ethernet<br>IEEE 802.3at Power over Ethernet PLUS<br>RFC 768 UDP<br>RFC 793 TFTP<br>RFC 791 IP<br>RFC 792 ICMP<br>RFC 2068 HTTP<br>RFC 1112 IGMP version 1<br>RFC 2236 IGMP version 2<br>RFC 3376 IGMP version 3<br>RFC 2710 MLD version 1<br>FRC 3810 MLD version 2 |

| Environments | |
| --- | --- |
| Operating | Temperature: 0 ~ 50 degrees C<br>Relative Humidity: 5 ~ 95% (non-condensing) |
| Storage | Temperature: -10 ~ 70 degrees C<br>Relative Humidity: 5 ~ 95% (non-condensing) |

## Ordering Information

| WGSW-20160HP | L2+ 16-Port 10/100/1000BASE-T 802.3at PoE + 4G TP/SFP Combo Managed Switch (230 watts) |
|---|---|

## Related Products

| WGSW-24040HP | L2+ 24-Port 10/100/1000Mbps 802.3at PoE+ Managed Switch with 4 Shared SFP Ports (220 watts) |
|---|---|
| WGSW-24040HP4 | L2+ 24-Port 10/100/1000Mbps 802.3at PoE+ Managed Switch with 4 Shared SFP Ports (440 watts) |
| POE-161S | IEEE 802.3at Gigabit Power over Ethernet Plus Splitter with 5V/12VDC output (10/100/1000Mbps) |
| POE-162S | IEEE 802.3at Gigabit Power over Ethernet Plus Splitter with 12V/24VDC output (10/100/1000Mbps) |
| IPOE-162S | Industrial IEEE 802.3at Gigabit High Power over Ethernet Splitter |
| POE-E101 | IEEE 802.3af Power over Ethernet Extender |
| POE-E201 | IEEE 802.3at Power over Gigabit Ethernet Extender |
| POE-E202 | 1-Port 802.3at PoE+ to 2-port 802.3af/at Gigabit PoE Extender |
| IPOE-E202 | Industrial 1-Port 802.3at PoE+ to 2-Port 802.3af PoE Extender |
| LRP-101CH | 1-Port 10/100TX PoE PD + 1-Port Coax Long Reach PoE Injector |
| LRP-101UH | 1-Port 10/100TX PoE PD + 1-Port UTP Long Reach PoE Injector |

## Available Modules for  WGSW-20160HP

| MGB-GT | SFP-Port 1000BASE-T Module |
|---|---|
| MGB-SX | SFP-Port 1000BASE-SX mini-GBIC module |
| MGB-LX | SFP-Port 1000BASE-LX mini-GBIC module - 20km |
| MGB-L40 | SFP-Port 1000BASE-LX mini-GBIC module - 40km |
| MGB-L80 | SFP-Port 1000BASE-LX mini-GBIC module - 80km |
| 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 |
| MFB-FX | SFP-Port 100BASE-FX Transceiver (1310nm) - 2km |
| MFB-F20 | SFP-Port 100BASE-FX Transceiver (1310nm) - 20km |
| MFB-F40 | SFP-Port 100BASE-FX Transceiver (1310nm) - 40km |
| MFB-F60 | SFP-Port 100BASE-FX Transceiver (1310nm) - 60km |
| MFB-FA20 | SFP-Port 100BASE-BX Transceiver (WDM,TX:1310nm) - 20km |
| MFB-FB20 | SFP-Port 100BASE-BX Transceiver (WDM,TX:1550nm) - 20km |

**WGSW-20160HP**