

Product Specifications

Industrial 16-Port 10/100/1000Mbps + 4-Port 100/1000X SFP Managed Gigabit Switch

IGS-5225-16T4S

Version 1.0

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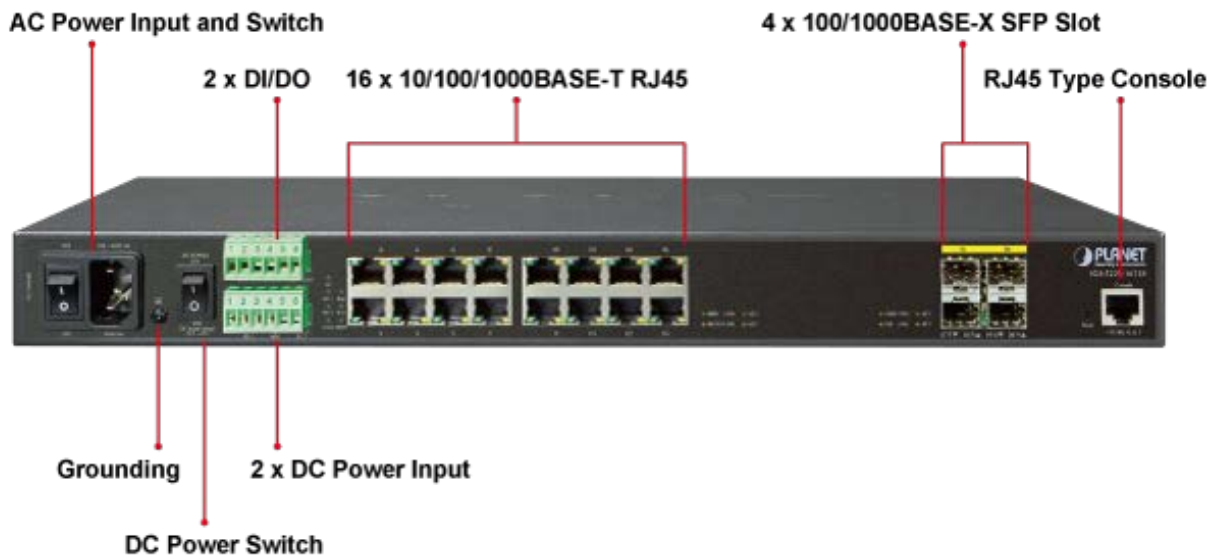
Change History:

Revision	Date	Author	Change List
1.0	2016/3/14	Bryant Wu	Initial release

Author	Bryant Wu	Editor:	Bryant Wu
Reviewed by:		Approved by:	Kent Kang

1. PRODUCT DESCRIPTION

PLANET IGS-5225-16T4S, a new industrial Layer 2+ managed Gigabit Switch, features 16 10/100/1000Mbps ports and 4 100/1000X SFP ports, and supports **static Layer 3 routing** in a 1U case. With a total **switch fabric of 40Gbps**, the IGS-5225-16T4S can handle large amounts of data in a secure topology linking to an industrial backbone or high capacity servers. The IGS-5225-16T4S is capable of providing non-blocking switch fabric and wire-speed throughput in the temperature range from **-40 to 75 degrees C** without any packet loss and CRC error. It greatly simplifies the tasks of upgrading the industrial LAN for catering to increasing bandwidth demands. Furthermore, it adopts user-friendly “**Front Access**” design for easy wiring and maintenance of the IGS-5225-16T4S when placed in the cabinet.

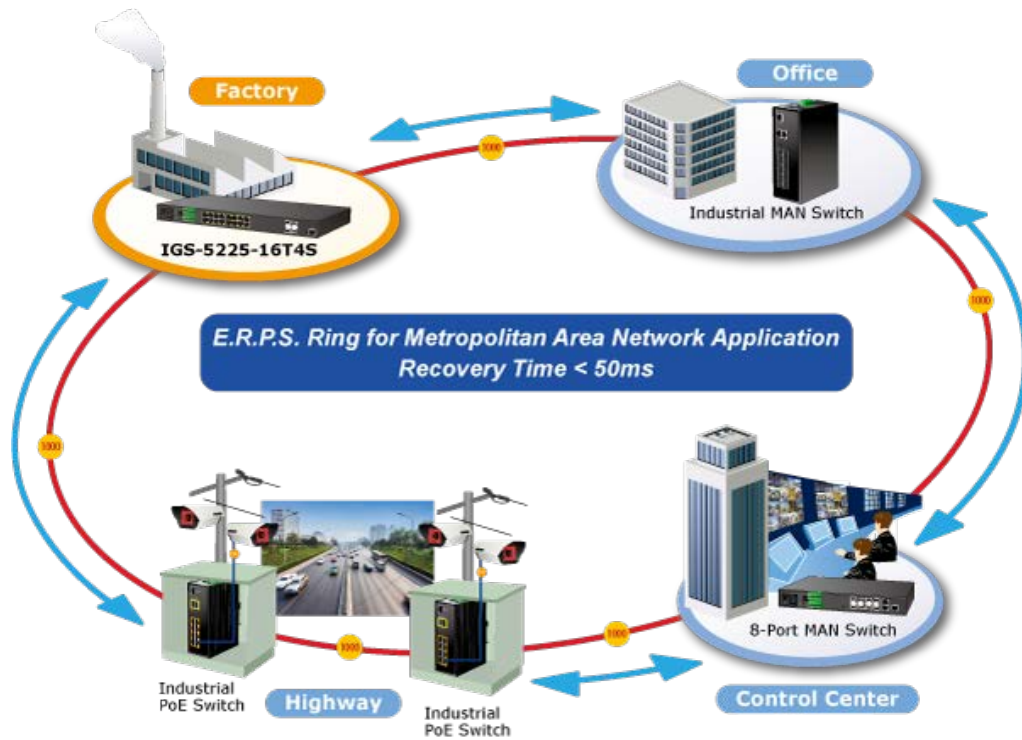


AC and DC Redundant Power to Ensure Continuous Operation

The IGS-5225-16T4S possesses a **100~240V AC** power supply and dual **36~60V DC** power supply utilized as redundant power supply to ensure its continuous operation. Its redundant power system is specifically designed to handle the demands of high-tech facilities requiring the highest power integrity. Furthermore, with the 36~60V DC power supply implemented, the IGS-5225-16T4S can be applied as a **telecom level** device and placed in almost any difficult environment.

Redundant Ring, Fast Recovery for Critical Network Applications

The IGS-5225-16T4S 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, Spanning Tree Protocol (802.1s MSTP), and redundant power input system into customer's industrial automation network to enhance system reliability and uptime in harsh factory environments. In a certain, simple Ring network, the recovery time of data link can be as fast as 20ms.



Digital Input and Digital Output for External Alarm

To help the network administrators efficiently manage unexpected network situations, the IGS-5225-16T4S provides Digital Input and Digital Output for external alarm device on the front panel. The Digital Input can be used to detect and log the status of the external devices such as door intrusion detector. The Digital Output could be used to send alarm whenever the IGS-5225-16T4S has port link-down or power failure.

Digital Input

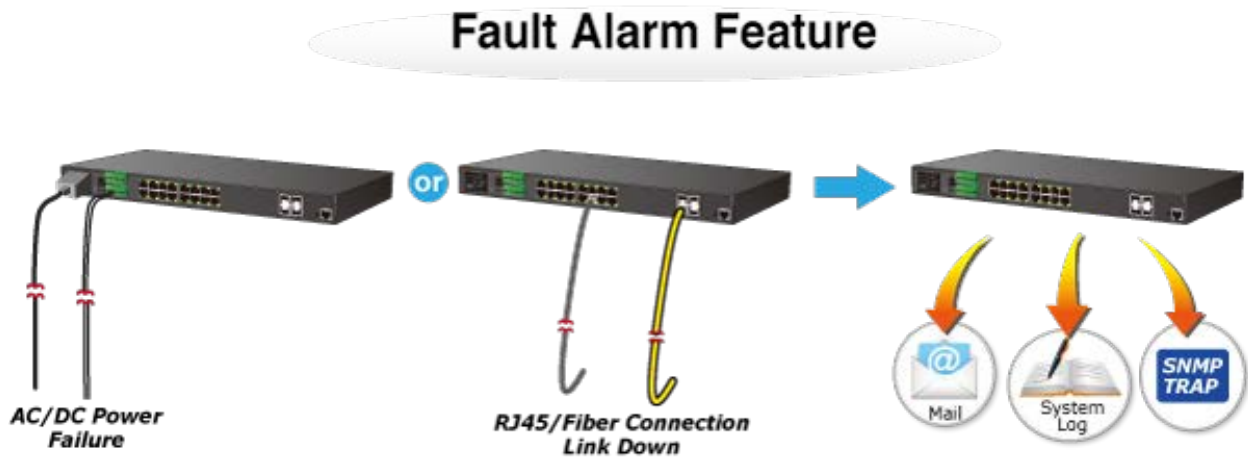
<p>Security OK!!</p>	<p>Alarm Warning</p>	<p>Alarm Messaging</p>
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Digital Output

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Effective Alarm Alert for Better Protection

The IGS-5225-16T4S supports a Fault Alarm feature which can alert the users when there is something wrong with the switches. With this ideal feature, the users would not have to waste time to find where the problem is. It will help to save time and human resource.



IPv6/IPv4 Dual Stack

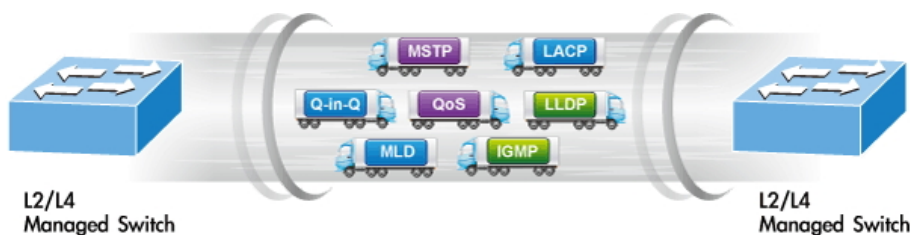
Supporting both IPv6 and IPv4 protocols, the IGS-5225-16T4S helps data centers, campuses, telecoms, and more to experience the IPv6 era with the lowest investment as its network facilities need not be replaced or overhauled if the IPv6 FTTx edge network is set up.

Layer 3 IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

The IGS-5225-16T4S offers IPv4/IPv6 VLAN routing feature which allows to crossover 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 Switch can be programmed for advanced switch management functions such as dynamic port link aggregation, **Q-in-Q VLAN**, private VLAN, **Multiple Spanning Tree Protocol (MSTP)**, Layer 2 to Layer 4 QoS, bandwidth control and **IGMP/MLD Snooping**. Via the link aggregation of supporting ports, the IGS-5225-16T4S allows the operation of a high-speed trunk to combine with multiple fiber ports and supports fail-over as well.



Powerful Security

The IGS-5225-16T4S offers a comprehensive **layer 2 to layer 4 Access Control List (ACL)** for enforcing security to the edge. It can be used to restrict network access by denying packets based on source and destination IP address, TCP/UDP ports or defined typical network 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. The IGS-5225-16T4S 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.

Excellent Traffic Control

The IGS-5225-16T4S is loaded with powerful traffic management and QoS features to enhance connection services by telecoms and ISPs. The QoS features include wire-speed Layer 4 traffic classifiers and bandwidth limit that are particularly useful for multi-tenant units, multi-business units, Telco and network service providers' applications. It also empowers the industrial environment to take full advantage of the limited network resources and guarantees the best performance in VoIP and video conferencing transmission.

Efficient and Secure Management

With built-in Web-based management interface, the IGS-5225-16T4S L2+ Managed Switch offers an easy-to-use, platform-independent management and configuration facility which includes Console, Web and SNMP management interfaces. The SNMP can be managed via any management software based on the standard of SNMP Protocol. For reducing product learning time, it offers Cisco-like command via Telnet or console port and customer does not need to learn new console command. Moreover, it also offers secure remote management by supporting **SSH**, **SSL** and **SNMP v3** connections which encrypt the packet content at each session.



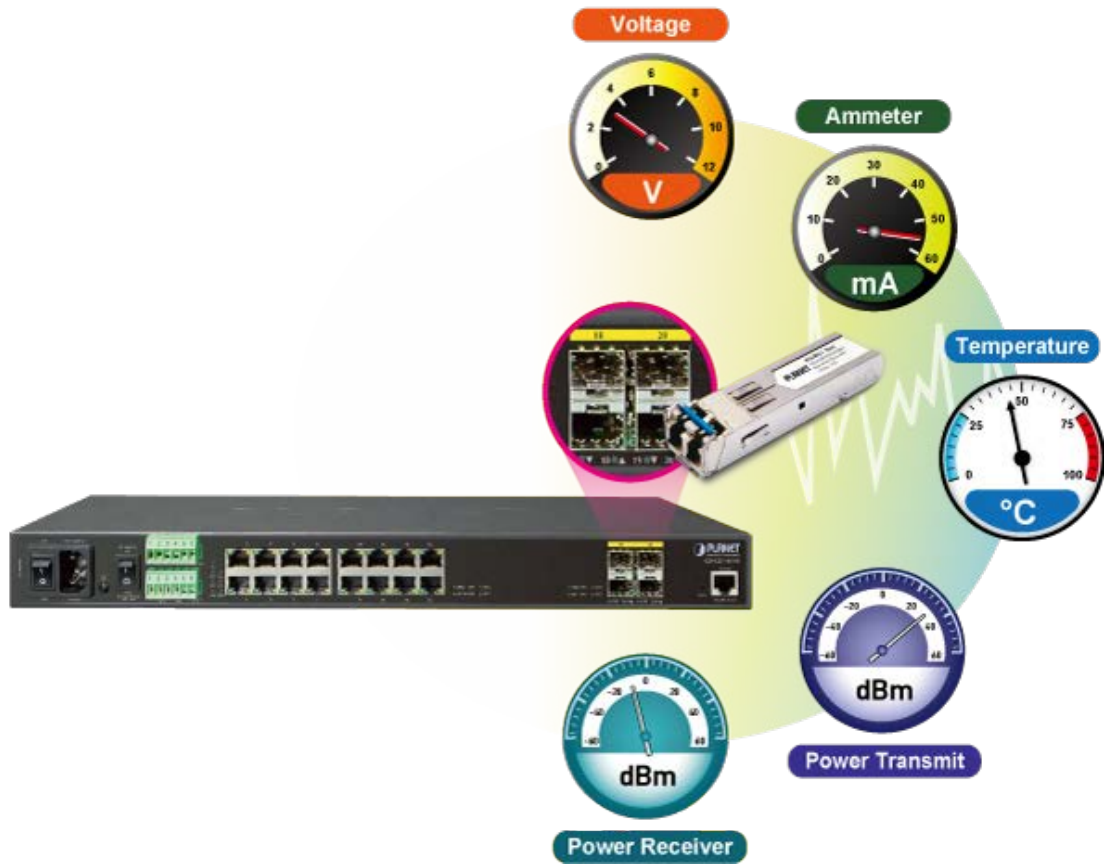
Flexibility and Extension Solution

The four mini-GBIC slots built in the IGS-5225-16T4S 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 2km (multi-mode fiber) or up to 10/20/30/40/50/70/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications within the industrial data centers and distributions.

Intelligent SFP Diagnosis Mechanism

The IGS-5225-16T4S supports SFP-DDM (Digital Diagnostic Monitor) function that greatly helps network administrator to easily monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

Digital Diagnostic Monitor (DDM)



2. PRODUCT FEATURES

➤ **Physical Port**

- 16-port 10/100/1000BASE-T RJ45 copper
- 4 100/1000BASE-X mini-GBIC/SFP slots, compatible with 100BASE-FX SFP
- RJ45 to RS232 DB9 console interface for basic management and setup

➤ **Hardware Conformance**

- One 100 to 240V AC or dual 36 to 60V DC power input, redundant power with polarity reverse protection function
 - Active-active redundant power failure protection
 - Backup of catastrophic power failure on one supply
 - Fault tolerance and resilience
- 19-inch rack-mountable design
- IP30 metal case
- Supports 6000V DC Ethernet ESD protection
- -40 to 75 degrees C operating temperature for DC power input
- -10 to 60 degrees C operating temperature for AC power input

➤ **Digital Input & Digital Output**

- 2 Digital Input (DI)
- 2 Digital Output (DO)
- Integrates sensors into auto alarm system
- Transfers alarm to IP network via email and SNMP trap

➤ **Layer 3 IP Routing Features**

- Supports maximum 32 static routes and route summarization

➤ **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 255 VLANs groups, out of 4095 VLAN IDs
 - Provides Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
 - Private VLAN Edge (PVE)
 - Protocol-based VLAN
 - MAC-based VLAN
 - IP subnet-based VLAN
 - Voice VLAN

- 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, with 8 ports for each trunk
 - Up to 16Gbps bandwidth (full duplex mode)
- Provides port mirror (many-to-1)
- Port mirroring monitors the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops
- Supports E.R.P.S. (Ethernet Ring Protection Switching)
- IEEE 1588 and Synchronous Ethernet network timing (Port1 ~ 12)

➤ **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
- Traffic-policing policies 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
- MVR (Multicast VLAN Registration)

➤ **Security**

- Authentication
 - IEEE 802.1x port-based/MAC-based network access authentication
 - IEEE 802.1x authentication with guest VLAN
 - Built-in RADIUS client to cooperate with the RADIUS servers
 - RADIUS/TACACS+ users access authentication

- Access Control List
 - IP-based Access Control List (ACL)
 - MAC-based Access Control List (ACL)
- Source MAC/IP address binding
- **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
- 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/SSL secure access
- **IPv6** address/NTP 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 and option 82
- User privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- Network diagnostic
 - SFP-DDM (Digital Diagnostic Monitor)
 - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
 - ICMPv6/ICMPv4 remote ping
- 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 VSC7429	x 1
CPU	MIPS 416MHz (integrated with VSC7429)	x 1
Giga PHY	Vitesse VSC8504XKS-04	x 2
Flash Size	16M bytes	x 1
DRAM Size	128M bytes	x 1
System AC-DC Open Frame Power Supply	Mean Well EPS-35-12	x 1

3.2 FUNCTION SPECIFICATIONS

Product	IGS-5225-16T4S
Hardware Specifications	
Copper Ports	16 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports
SFP/mini-GBIC Slots	4 100/1000BASE-X SFP interfaces Compatible with 100BASE-FX SFP transceiver
Console	1 x RS232-to-RJ45 serial port (115200, 8, N, 1)
Switch Architecture	Store-and-Forward
Switch Fabric	40Gbps/non-blocking
Throughput	29.76Mpps@64Bytes
Address Table	8K entries, automatic source address learning and aging
Shared Data Buffer	4M bits
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
Dimensions (W x D x H)	440 x 200 x 44.5 mm, 1U height
Weight	2672g
LED	System: AC (Green), DC1 (Green), DC2 (Green), Fault (Red) Ring (Green), R.O. (Green), DI/DO (Red) 10/100/1000T RJ45 Interfaces (Port 1 to Port 16): 1000Mbps LNK/ACT (Green) 10/100Mbps LNK/ACT (Orange) 100/1000Mbps SFP Interfaces (Port 17 to Port 20): 1000Mbps LNK/ACT (Green) 100Mbps LNK/ACT (Orange)
Power Consumption	Max. 15.2 watts/51.8 BTU
Power Requirements – AC	AC 100~240V, 50/60Hz 0.4A
Power Requirements – DC	DC 36~60V, 0.6A
DI/DO	2 Digital Input (DI): Level 0: -24~2.1V Level 1: 2.1~24V

	Max. input current: 10mA 2 Digital Output (DO): Open collector to 24VDC, 100mA
ESD Protection	6KV DC
Layer 2 Management Functions	
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable
Port Status	Display each port's speed duplex mode, link status, flow control status, auto-negotiation status, trunk status
Port Mirroring	TX/RX/Both Many-to-1 monitor
VLAN	802.1Q tagged based VLAN Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN IP subnet-based VLAN MVR (Multicast VLAN registration) Up to 255 VLAN groups, out of 4095 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk 10 groups with 8 ports per trunk
Spanning Tree Protocol	IEEE 802.1D Spanning Tree Protocol (STP) IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
QoS	Traffic classification based, strict priority and WRR 8-level priority for switching: <ul style="list-style-type: none"> - Port number - 802.1p priority - 802.1Q VLAN tag - DSCP/ToS field in IP packet
IGMP Snooping	IGMP (v1/v2/v3) snooping, up to 255 multicast groups IGMP querier mode support
MLD Snooping	MLD (v1/v2) snooping, up to 255 multicast groups MLD querier mode support
Access Control List	IP-based ACL/MAC-based ACL Up to 256 entries
Bandwidth Control	Per port bandwidth control Ingress: 100Kbps~1000Mbps Egress: 100Kbps~1000Mbps
Layer 3 Functions	
IP Interfaces	Max. 8 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 software static routing IPv6 software static routing

Management		
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c	
Secure Management Interfaces	SSH, SSL, SNMPv3	
SNMP MIBs	RFC 1213 MIB-II RFC 1493 Bridge MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2819 RMON MIB (Groups 1, 2, 3 and 9) RFC 2737 Entity MIB	RFC 2618 RADIUS Client MIB RFC 2863 IF-MIB RFC 2933 IGMP-STD-MIB RFC 3411 SNMP-Frameworks-MIB RFC 4292 IP Forward MIB RFC 4293 IP MIB RFC 4836 MAU-MIB IEEE 802.1X PAE LLDP
Standards Conformance		
Regulatory Compliance	FCC Part 15 Class A, CE	
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000T IEEE 802.3x 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 1588v2 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: -10 ~ 60 degrees C for AC power input -40 ~ 75 degrees C for DC power input Relative Humidity: 5 ~ 95% (non-condensing)	
Storage	Temperature: -40 ~ 80 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	

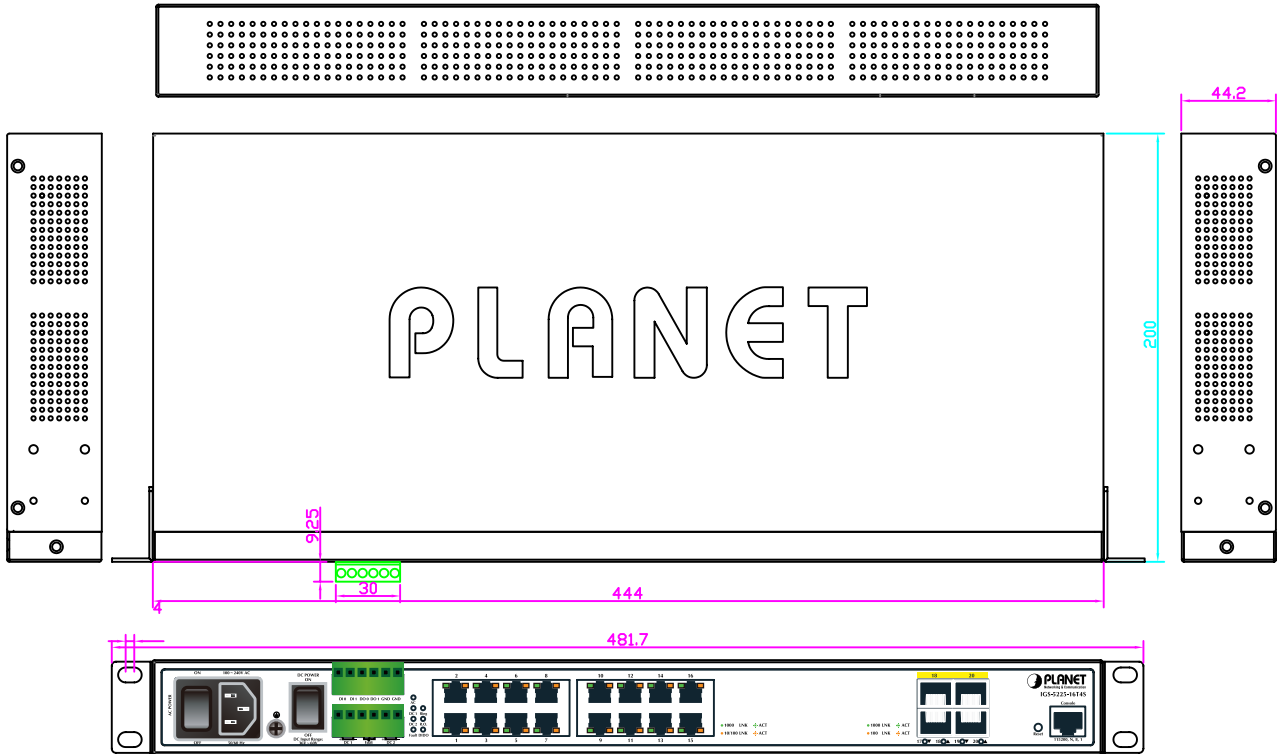
3.3 PHYSICAL SPECIFICATIONS:

Dimensions:

440 x 200 x 44.5 mm (W x D x H)

Weight:

2672g



LED Definition:

■ System

LED	Color	Function
AC	Green	Lights to indicate AC power input has power.
DC1	Green	Lights to indicate DC power input 1 has power.
DC2	Green	Lights to indicate DC power input 2 has power.
Fault	Red	Lights to indicate that Switch AC/DC or port has failed.
Ring	Green	Lights to indicate that the ERPS Ring has been created successfully.
R.O.	Green	Lights to indicate that Ring state is in idle mode.
		Blinks to indicate that the Ring state is in protected mode.
DI/DO	Red	Blinks to indicate that Switch AC/DC or port has failed or DI has event.

■ Per 10/100/1000BASE-T Port (Port-1~Port-16)

LED	Color	Function	
1000 LNK/ACT	Green	Lights	Indicating the port is running at 1000Mbps speed and successfully established.
		Blinks	Indicating that the switch is actively sending or receiving data over that port.
10/100 LNK/ACT	Orange	Lights	Indicating the port is running at 10/100Mbps speed and successfully established.
		Blinks	Indicating that the switch is actively sending or receiving data over that port.

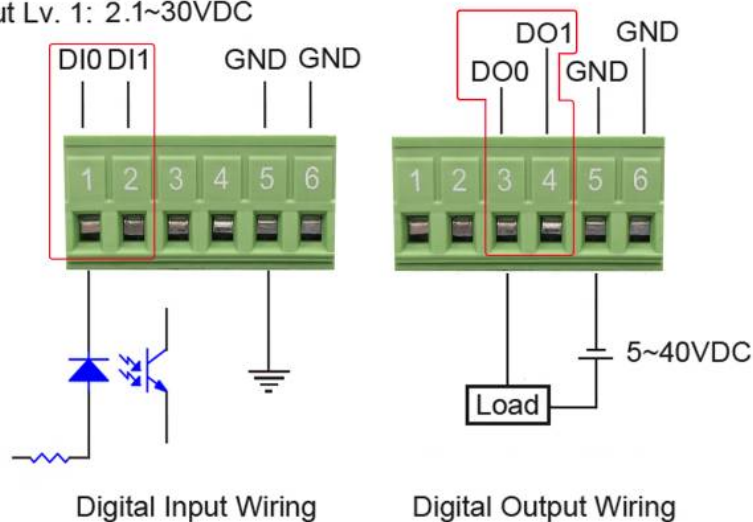
■ Per 100/1000BASE-X SFP Interface (Port-17~Port-20)

LED	Color	Function	
1000 LNK/ACT	Green	Lights	Indicating the port is running at 1000Mbps speed and successfully established.
		Blinks	Indicating that the switch is actively sending or receiving data over that port.
100 LNK/ACT	Orange	Lights	Indicating the port is running at 100Mbps speed and successfully established.
		Blinks	Indicating that the switch is actively sending or receiving data over that port.

■ DI/DO connector:

Input Lv. 0: -30~2.1VDC

Input Lv. 1: 2.1~30VDC



3.4 ENVIRONMENTAL SPECIFICATIONS

Operating:

Temperature: -40 ~75 degrees C with DC power input
 -10~60 degrees C with AC power input

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

Storage:

Temperature: -40 ~85 degrees C

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

3.5 ELECTRICAL SPECIFICATIONS

Power Requirements:

36~60V DC, redundant power with polarity reverse protection
 100~240V AC

Power Consumption:

LOADING DC INPUT	System on without any devices attached	Full Loading
	34V	0.23A, 7.82W
36V	0.22A, 7.92W	0.44A, 15.84W
48V	0.17A, 8.16W	0.34A, 16.32W
60V	0.16A, 9.6W	0.28A, 16.8W

LOADING AC INPUT	System on without any devices attached	Full Loading
	100V	0.136A, 7.2W
110V	0.128A, 7.1W	0.246A, 15.1W
220V	0.081A, 7.1W	0.15A, 14.9W
240V	0.078A, 7.1W	0.15A, 14.9W

3.6 REGULATORY COMPLIANCE

FCC Part 15 Class A, CE

Stability Testing:

- IEC60068-2-32 (Free Fall)
- IEC60068-2-27 (Shock)
- IEC60068-2-6 (Vibration)

3.7 RELIABILITY

MTBF > 100,000hrs @ 25 degrees C

3.8 BASIC PACKAGING

- The Industrial Managed Switch x 1
- Quick Installation Guide x 1
- RJ45-to-DB9 RS232 cable x 1
- Wall Mounting Kit x 1
- RJ45 Dust Cap x 17
- SFP Dust Cap x 4
- Power Cord x 1

3.9 PACKING DIMENSIONS

Dimensions: 520 x 450 x 90mm
Weight: TBD
Quantity: 5pcs in one carton