

# Product Specifications

## Industrial L2/L4 16-Port 10/100/1000T + 2-Port 100/1000X SFP Managed Switch

### IGS-4215-16T2S

Version 1.0

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#### Change History:

Revision:	Date:	Author:	Change List
Version 1.0	2019/12/09	Angeline Huang	Initial Release

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Reviewed By:		Approved By:	Kent Kang

## 1. PRODUCT DESCRIPTION



### Cost-effective Full Solution Ideal for Hardened Environment

Designed to be installed in heavy industrial demanding environments, the IGS-4215-16T2S is the new member of PLANET Industrial-grade, DIN-rail type **L2/L4 Managed Gigabit Switch** family 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, **2 extra 100/1000BASE-X SFP fiber slots** for data and video uplink. The IGS-4215-16T2S is able to operate reliably, stably and quietly in any hardened environment without affecting its performance. It comes operating temperature ranging from -40 to 75 degrees C in a rugged **IP30** metal housing.

### Environmentally Hardened Design

With the IP30 industrial case, the IGS-4215-16T2S provides a high level of immunity against electromagnetic interference and heavy electrical surges which are usually found on plant floors or in curb-side traffic control cabinets without air conditioner. Being able to operate under the temperature range from -40 to 75 degrees C, the IGS-4215-16T2S can be placed in almost any difficult environment.

### Robust Protection

The IGS-4215-16T2S provides contact discharge of  $\pm 6\text{KV}$  DC and air discharge of  $\pm 8\text{KV}$  DC for Ethernet ESD protection. It also supports  $\pm 4\text{KV}$  surge immunity to improve product stability and protects users' networks from devastating ESD attacks, making sure the flow of operation does not fluctuate.

### IPv6/IPv4 Dual Stack Management

Supporting both IPv6 and IPv4 protocols, the IGS-4215-16T2S 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 IGS-4215-16T2S can be programmed for advanced switch management functions such as dynamic port link aggregation, 802.1Q VLAN, **Q-in-Q VLAN**, **Multiple Spanning Tree Protocol (MSTP)**, **loop** and **BPDU guard**, **IGMP snooping**, and **MLD snooping**. Via the link aggregation, the IGS-4215-16T2S allows the operation of a high-speed trunk to combine with multiple

ports such as an 8Gbps fat pipe, 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 IGS-4215-16T2S 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/unicast **storm control**, per port **bandwidth control**, 802.1p/CoS/IP DSCP QoS priority and remarking. It guarantees the best performance in VoIP and video stream transmission, and empowers the enterprises to take full advantage of the limited network resources.

### **User-friendly and Secure Management**

The IGS-4215-16T2S comes with enhanced cybersecurity to fend off cyberthreats and cyberattacks. It supports SSHv2, TLS and SSL protocols to provide strong protection against advanced threats. Served as a key point to transmit, the cybersecurity feature of the IGS-4215-16T2S protects the switch management and enhances the security of the mission-critical network without any extra deployment cost and effort.

### **Powerful Security**

PLANET IGS-4215-16T2S 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 limiting the number of network devices on a given port.

### **Advanced Network Security**

The IGS-4215-16T2S 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.

### **Flexibility and Long-distance Extension Solution**

The two additional SFP slots built in the IGS-4215-16T2S support 100BASE-FX /1000BASE-SX/LX SFP (Small Form-factor Pluggable) fiber transceivers to uplink to backbone switch in long distance. The distance can be extended from 550 meters to 2 kilometers (multi-mode fiber) and up to 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 IGS-4215-16T2S supports **SFP-DDM (Digital Diagnostic Monitor)** function that can easily monitor real-time parameters of the SFP for the network administrator, 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 with auto MDI/MDI-X function
- 2 SFP slot interfaces, supporting 100/1000BASE-X SFP transceiver type auto detection
- 1-port RJ45 console interface for basic management and setup

### ▶ **Industrial Case and Installation**

- Dual power input, redundant power with reverse polarity protection
  - DC 12 to 48V input or AC 24V input
  - Active-active redundant power failure protection
  - Backup of catastrophic power failure on one supply
  - Fault tolerance and resilience
- IP30 metal case
- DIN-rail and wall-mount designs
- Supports ESD 6KV DC Ethernet protection
- Supports -40 to 75 degrees C operating temperature
- Free fall, shock-proof and vibration-proof for industries

### ▶ **Switching**

- Features Store-and-Forward mode with wire-speed filtering and forwarding rates
- IEEE 802.3x flow control for full duplex operation and back pressure for half duplex operation
- 8K MAC address table size
- 10K jumbo frame
- Automatic address learning and address aging
- Supports CSMA/CD protocol

### ▶ **Layer 2 Features**

- Supports **VLAN**
  - IEEE 802.1Q tagged VLAN
  - Up to 256 VLAN groups, out of 4096 VLAN IDs
  - Provider bridging (VLAN Q-in-Q, IEEE 802.1ad) support
  - Private VLAN (Protected port)
  - Protocol-based VLAN
  - Voice VLAN
  - GVRP
- 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**
  - IEEE 802.3ad Link Aggregation Control Protocol (LACP)
  - Cisco ether-channel (static trunk)
  - Up to 8 trunk groups
  - Up to 8 ports per trunk group with 16Gbps bandwidth

- Provides port mirror (many-to-1)
- IPv6 MAC/VLAN/Multicast Address Table
- Loop protection to avoid broadcast loops

▶ **Quality of Service**

- Ingress/Egress Rate Limit per port bandwidth control
- Support 8 priority queues on all switch ports
- Traffic classification
  - IEEE 802.1p CoS
  - IP TOS/DSCP/IP precedence of IPv4/IPv6 packets
  - IP TCP/UDP port number
  - Typical network application
- DSCP remarking

▶ **Multicast**

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

▶ **Security**

- Storm Control support
  - Broadcast / Multicast / Unicast
- Authentication
  - IEEE 802.1X port-based network access authentication
  - Built-in RADIUS client to cooperate with the RADIUS servers
  - DHCP Relay and DHCP Option 82
  - RADIUS/TACACS+ users access authentication
- Access Control List
  - IPv4/IPv6 IP-based ACL
  - IPv4/IPv6 IP-based ACE
  - MAC-based ACL
  - MAC-based ACE
- 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
- IP address access management to prevent unauthorized intruder

▶ **Management**

- IPv4 and IPv6 dual stack management
- Switch Management Interface
  - IPv4/IPv6 Web switch management
  - Console and telnet Command Line Interface

- SNMP v1, v2c, v3
- SSH, TLS and SSL secure access
- IPv6 IP address/NTP/DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- Static and DHCP for IP address assignment
- System Maintenance
  - Firmware upload/download via HTTP/TFTP
  - Hardware reset button for system reboot or reset to factory default
  - Dual images
- User Privilege levels control
- Network Time Protocol (NTP)
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- Syslog remote alarm
- SNMP Management
  - SNMP trap for interface link up and link down notification
  - Four RMON groups (history, statistics, alarms and events)
- PLANET Smart Discovery Utility for deployment management
- Network diagnostic
  - SFP-DDM (Digital Diagnostic Monitor)
  - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
- ICMPv6 / ICMPv4 remote pin

### 3. PRODUCT SPECIFICATIONS

#### 3.1 MAIN COMPONENTS

<b>Switch ASIC:</b>	Realtek RTL8382MI	x 1
<b>Gigabit PHY</b>	Realtek RTL8218B/I	x 1
<b>Flash:</b>	16Mbytes	x 1
<b>DDR RAM:</b>	128Kbytes	x 1

#### 3.2 FUNCTION SPECIFICATIONS

<b>Product</b>	IGS-4215-16T2S
<b>Hardware Specifications</b>	
<b>Copper Ports</b>	16 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports
<b>Gigabit SFP Slots</b>	2 100/1000BASE-SX/LX/BX SFP interfaces
<b>Console</b>	1 RJ45 serial port (115200,8, N, 1)
<b>Switch Architecture</b>	Store-and-Forward
<b>Switch Fabric</b>	36Gbps (non-blocking)
<b>Switch Throughput@64 bytes</b>	26.79Mpps@ 64 bytes
<b>MAC Address Table</b>	8K entries
<b>Shared Data Buffer</b>	4.1Mbits
<b>Flow Control</b>	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
<b>Jumbo Frame</b>	10 Kbytes
<b>ESD Protection</b>	6KV DC
<b>Enclosure</b>	IP30 metal case
<b>Installation</b>	DIN-rail kit and wall-mount ear
<b>Reset Button</b>	< 5 sec: System reboot > 5 sec: Factory default
<b>LED</b>	<p><b>System</b></p> <ul style="list-style-type: none"> <li>■ <b>Green:</b> Power 1</li> <li>■ <b>Green:</b> Power 2</li> <li>■ <b>Red:</b> Power Fault</li> </ul> <p><b>Per 10/100/1000T RJ45 Ports</b></p> <ul style="list-style-type: none"> <li>■ <b>Green:</b> 1000 LNK/ACT</li> <li>■ <b>Orange:</b> 10/100 LNK/ACT</li> </ul> <p><b>Per SFP Interface</b></p> <ul style="list-style-type: none"> <li>■ <b>Green:</b> 1000 LNK/ACT</li> <li>■ <b>Orange:</b> 100 LNK/ACT</li> </ul>
<b>Connector</b>	Removable 6-pin terminal block for power input

	<ul style="list-style-type: none"> <li>- Pin 1/2 for Power 1</li> <li>- Pin 3/4 for fault alarm</li> <li>- Pin 5/6 for Power 2</li> </ul>
<b>Alarm</b>	One relay output for power failure. Alarm relay current carry ability: 1A @ 24V DC
<b>Power Requirements</b>	Dual 12~48V DC 24V AC
<b>Power Consumption</b>	DC input: Max. 3.4 watts/11.6BTU (System on) Max. 12.5 watts/42.7BTU (Full loading)
	AC input: Max. 6 watts/20.5BTU (System on) Max. 15 watts/51.2BTU (Full loading)
<b>Dimensions (W x D x H)</b>	66 x 107 x 152 mm
<b>Weight</b>	813g
<b>Layer 2 Functions</b>	
<b>Port Mirroring</b>	TX/RX/Both Many-to-1 monitor Up to 4 sessions
<b>VLAN</b>	802.1Q tagged-based VLAN Up to 256 VLAN groups, out of 4094 VLAN IDs 802.1ad Q-in-Q tunneling (VLAN stacking) Voice VLAN Protocol VLAN Private VLAN (Protected port) GVRP
<b>Link Aggregation</b>	IEEE 802.3ad LACP and static trunk Cisco ether-channel (Static Trunk) Up to 8 trunk groups Up to 8 ports per trunk group with 16Gbps bandwidth
<b>Spanning Tree Protocol</b>	IEEE 802.1D Spanning Tree Protocol (STP) IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) STP BPDU Guard, BPDU Filtering and BPDU Forwarding
<b>IGMP Snooping</b>	IPv4 IGMP snooping v1, v2, v3 IGMP querier IGMP Snooping port filtering
<b>MLD Snooping</b>	IPv6 MLD snooping v1, v2, up to 256 multicast groups
<b>Access Control List</b>	IPv4/IPv6 IP-based ACL/MAC-based ACL IPv4/IPv6 IP-based ACE/MAC-based ACE
<b>QoS</b>	Ingress/Egress Rate Limit per port bandwidth control

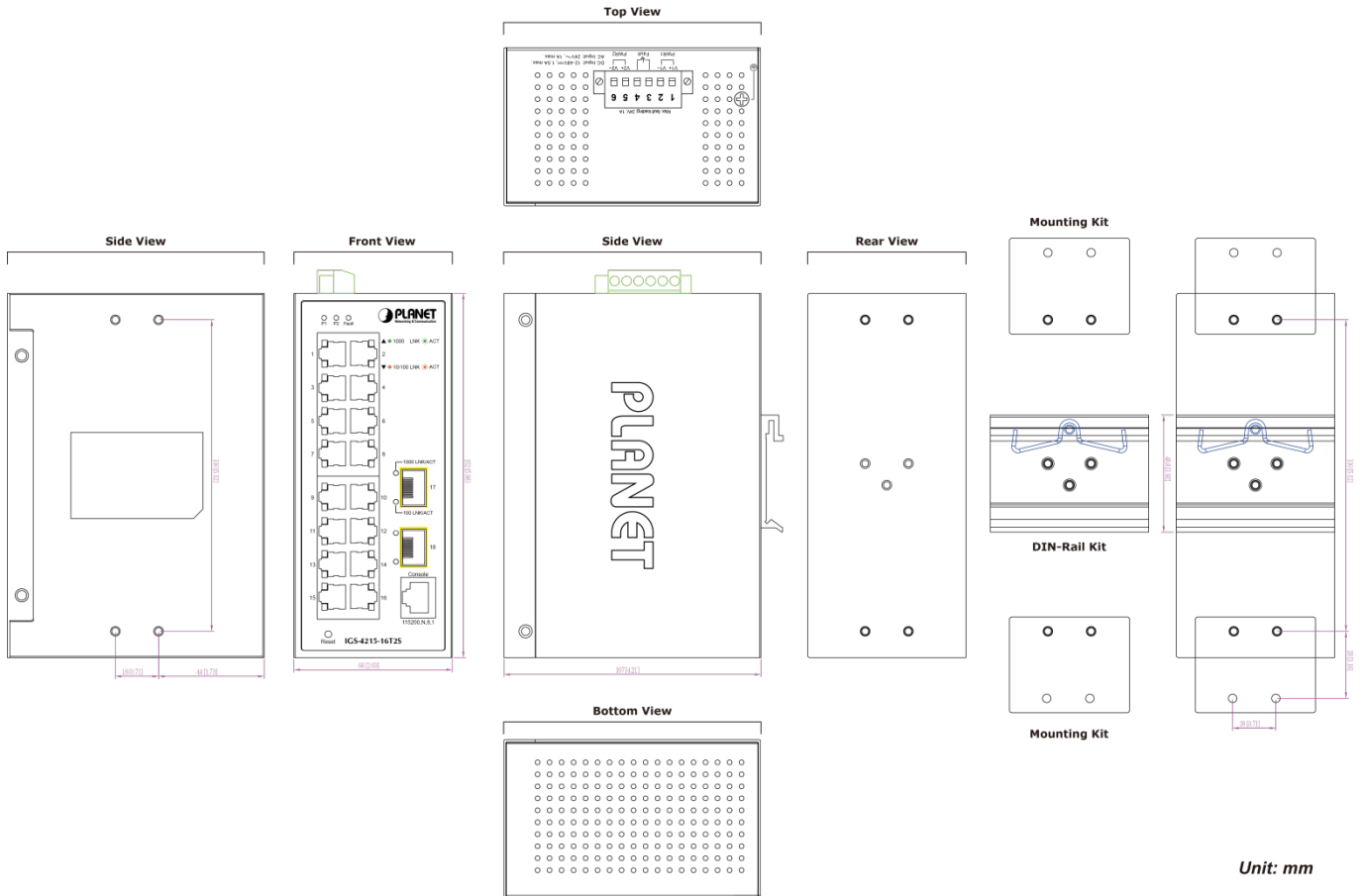


	<p>8-level priority for switching</p> <ul style="list-style-type: none"> <li>- Port number</li> <li>- 802.1p priority</li> <li>- DSCP/IP precedence of IPv4/IPv6 packets</li> <li>- Typical network application</li> </ul> <p>DSCP remarking</p>
<b>Security</b>	<p>IEEE 802.1X port-based authentication</p> <p>IP-MAC port binding</p> <p>MAC filtering</p> <p>Static MAC address</p> <p>Built-in RADIUS client to cooperate with RADIUS server</p> <p>RADIUS/TACACS+ authentication</p> <p>DHCP Relay and DHCP Option 82</p> <p>STP BPDU guard, BPDU filtering and BPDU forwarding</p> <p>DoS attack prevention</p> <p>ARP inspection</p> <p>IP source guard</p> <p>Storm control support</p> <ul style="list-style-type: none"> <li>- Broadcast / Multicast / Unicast</li> </ul>
<b>Management Functions</b>	
<b>Basic Management Interfaces</b>	Console; Telnet; Web browser; SNMP v1, v2c
<b>Secure Management Interfaces</b>	SSHv2, TLS v1.1/v1.2, SSL, SNMP v3
<b>System Management</b>	<p>Firmware upgrade by HTTP protocol through Ethernet network</p> <p>Configuration upload/download through HTTP</p> <p>Remote Syslog</p> <p>System log</p> <p>LLDP protocol</p> <p>SNTP</p> <p>PLANET Smart Discovery Utility</p>
<b>SNMP MIBs</b>	<p>RFC 1213 MIB-II</p> <p>RFC 1493 Bridge MIB</p> <p>RFC 1643 Ethernet MIB</p> <p>RFC 2863 Interface MIB</p> <p>RFC 2665 Ether-Like MIB</p> <p>RFC 2819 RMON MIB (Groups 1, 2, 3 and 9)</p> <p>RFC 2737 Entity MIB</p>
<b>Standards Conformance</b>	
<b>Regulatory Compliance</b>	FCC Part 15 Class A, CE
<b>Stability Testing</b>	<p>IEC 60068-2-32 (free fall)</p> <p>IEC 60068-2-27 (shock)</p> <p>IEC 60068-2-6 (vibration)</p>
<b>Standards Compliance</b>	<p>IEEE 802.3 10BASE-T</p> <p>IEEE 802.3u 100BASE-TX/100BASE-FX</p>

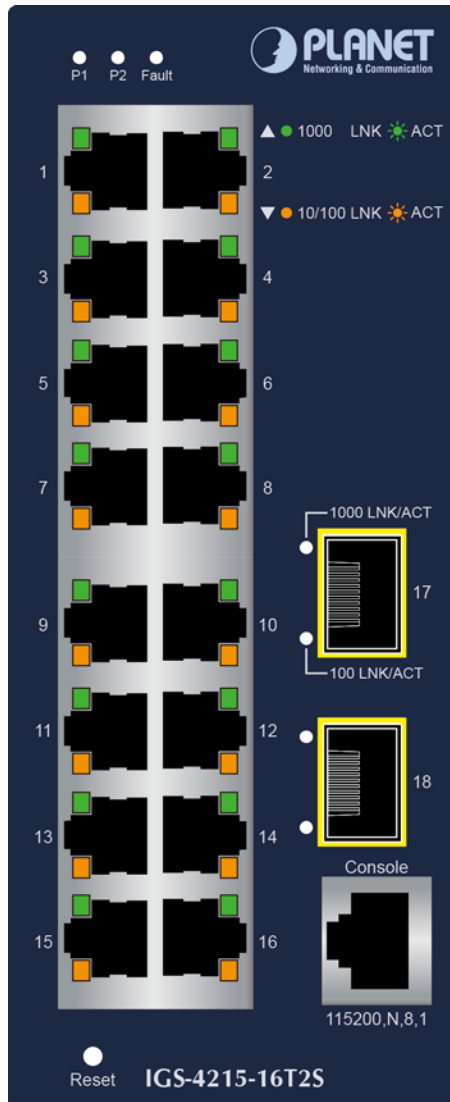
	<p>IEEE 802.3z Gigabit SX/LX          IEEE 802.3ab Gigabit 1000T          IEEE 802.3x flow control and back pressure          IEEE 802.3ad port trunk with LACP          IEEE 802.1D Spanning Tree Protocol          IEEE 802.1w Rapid Spanning Tree Protocol          IEEE 802.1s Multiple Spanning Tree Protocol          IEEE 802.1p Class of Service          IEEE 802.1Q VLAN tagging          IEEE 802.1x Port Authentication Network Control          IEEE 802.1ab LLDP          IEEE 802.3az for Energy-Efficient Ethernet          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          FRC 3810 MLD v2</p>
<b>Environment</b>	
<b>Operating Temperature</b>	-40 ~ 75 degrees C
<b>Storage Temperature</b>	-40 ~ 85 degrees C
<b>Humidity</b>	5 ~ 95% (non-condensing)

### 3.3 PHYSICAL SPECIFICATIONS:

- **Dimensions:**  
66 x 107 x 152 mm (W x D x H)
- **Weight:**  
813g
- **Diagram**



■ Front Panel:



■ LED Definition

► System

LED	Color	Function
P1	Green	Lights to indicate DC power input 1 has power.
P2	Green	Lights to indicate DC power input 2 has power.
Fault	Red	Lights to indicate that AC or DC power has failed.

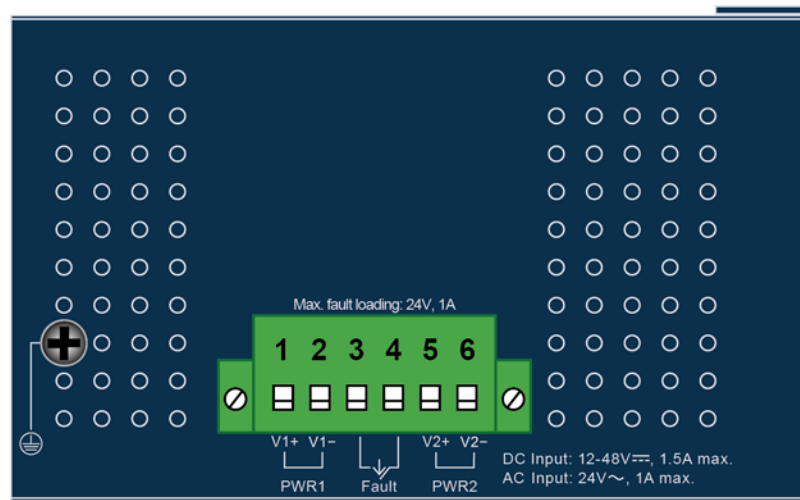
► Per 10/100/1000BASE-T Port

LED	Color	Function	
1000 LNK/ACT	Green	Lights:	To indicate the link through that port is successfully established at <b>1000Mbps</b> .
		Blinks:	To indicate that the switch is actively sending or receiving data over that port.
10/100 LNK/ACT	Amber	Lights:	To indicate the port is successfully established at <b>10/100Mbps</b> .
		Blinks:	To indicate that the Switch is actively sending or receiving data over that port.

► Per 100/1000BASE-SX/LX/BX SFP Interface

LED	Color	Function	
1000 LNK/ACT	Green	Lights:	To indicate the link through that port is successfully established at <b>1000Mbps</b> .
		Blinks:	To indicate that the switch is actively sending or receiving data over that port.
100Mbps LNK/ACT	Orange	Lights	To indicate the port is running at <b>100Mbps</b> and successfully established.
		Blinks	To indicate that the switch is actively sending or receiving data over that port.

■ Top View



### 3.4 ENVIRONMENTAL SPECIFICATIONS

**Operating:**

**Temperature:** -40°C ~ 75 degrees C

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

**Storage:**

**Temperature:** -40°C ~ 85 degrees C

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

### 3.5 ELECTRICAL SPECIFICATION

LOADING INPUT	System on without any devices attached	Port-1~Port-18 Link Up with Full Loading
DC 12V	2.52 watts/8.6BTU	11.16 watts/38.1BTU
DC 24V	2.64 watts/9BTU	11.04 watts/37.7BTU
DC 48V	3.4 watts/11.6BTU	12.5watts/42.7BTU
AC 24V	6 watts/20.5BTU	15 watts/51.2BTU

### 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 IGS-4215-16T2S x 1
- Quick Installation Guide x 1
- RJ45-to-DB9 RS232 Cable x 1
- DIN-rail Kit x 1
- Wall Mounting Kit x 1
- SFP Dust Cap x 2
- RJ45 Dust Cap x 17

### 3.9 PACKING INFORMATION

- Box Dimensions (W x D x H)** 300 x 170 x 90 mm
- Weight** 1.16kg
- Carton Dimensions (W x D x H)** 385 x 340 x 490 mm
- Carton Weight** 12.49kg
- Quantity** 10pcs in one carton