

# Industrial Layer 3 DIN-rail Managed Ethernet Switch



## Multi 1/10G for Factory and Metropolitan Long-reach Networking

PLANET IGS-6325 Series are the smallest yet high-capacity, industrial-grade Layer 3 managed switches with high-density hybrid copper and fiber optic interfaces in a DIN-rail type rugged case and can operate stably under the temperature range from **-40 to 75 degrees C**.

Models	10/100/1000T Copper	100/1000X SFP	1G/10G SFP+	Switch Capacity	Power Input
IGS-6325-8T8S4X	8	8	4	112Gbps	DC 12~48V AC 24V
IGS-6325-8T8S			--	32Gbps	
IGS-6325-8T4X	16	--	4	96Gbps	DC 9~48V AC 24V
IGS-6325-16T4S		4	--	40Gbps	

They're designed to be installed in any space-limited cabinets as they are small in size. Their connection distances can be flexibly extended via their powerful ports.



## Layer 3 Routing Support

The IGS-6325 Series enables the administrator to conveniently boost network efficiency by configuring Layer 3 IPv4/IPv6 VLAN static routing manually, and the IPv4 **OSPFv2** (Open Shortest Path First) settings automatically. The OSPF is an interior dynamic routing protocol for autonomous system based on link state. The protocol creates a database for link state by exchanging link states among Layer 3 switches, and then uses the Shortest Path First algorithm to generate a route table based on that database.

## Physical Port

- 8/16 10/100/1000BASE-T RJ45 copper ports
- 8/4 100/1000BASE-X SFP slots for SFP type auto detection
- 4 10GBASE-SR/LR SFP+ slots, compatible with 1000BASE-X SFP(IGS-6325-8T4X and IGS-6325-8T8S4X)
- One RJ45-to-RS232 console interface for basic management and setup

## Industrial Hardened Design

- Dual power input, redundant power with reverse polarity protection
  - DC 9/12 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
- DIN-rail and wall-mountable designs
- IP30 aluminum case
- Supports 6KV DC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

## Digital Input and 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

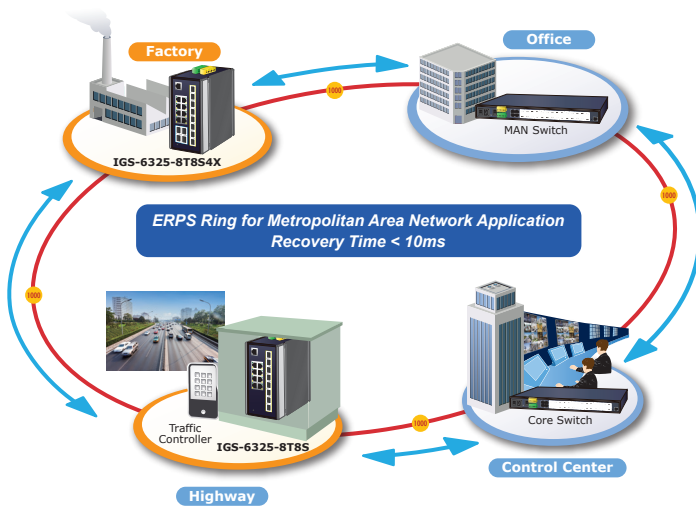
- IP dynamic routing protocol supports OSPFv2
- IPv4/IPv6 hardware static routing
- Routing interface provides per VLAN routing mode

## Layer 2 Features

- High performance of Store-and-Forward architecture, and runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Storm control support

### Redundant Ring, Fast Recovery for Critical Network Applications

The IGS-6325 Series 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 simple Ring network, the recovery time of data link can be as fast as 10ms.



### Network with Cybersecurity Helps Minimize Security Risks

The IGS-6325 Series comes with enhanced cybersecurity to fend off cyberthreats and cyberattacks. It supports SSHv2, TLS v1.2 and SSL protocols to provide strong protection against advanced threats. Served as a key point to transmit data over multiple long distance fiber optical connections to customer's critical equipment in a business network, the cybersecurity feature of the IGS-6325 Series protects the switch management and enhances the security of the mission-critical network without any extra deployment cost and effort.



### Modbus TCP Provides Flexible Network Connectivity for Factory Automation

With the supported **Modbus TCP/IP** protocol, the IGS-6325 Series can easily integrate with **SCADA** systems, **HMI** systems and other data acquisition systems in factory floors. It enables administrators to remotely monitor the industrial Ethernet switch's **operating information**, **port information**, communication status, and DI and DO status, thus easily achieving enhanced monitoring and maintenance of the entire factory.

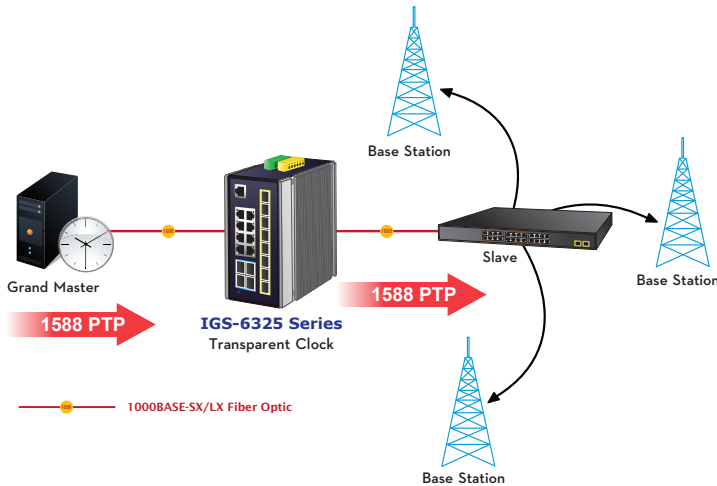
- Broadcast/Multicast/Unknown unicast
- Supports **VLAN**
  - IEEE 802.1Q tagged VLAN
  - Up to 255 VLANs groups, out of 4095 VLAN IDs
  - Supports provider bridging (VLAN Q-in-Q IEEE 802.1ad)
  - Private VLAN Edge (PVE)
  - Protocol-based VLAN
  - MAC-based VLAN
  - Voice VLAN
  - GVRP (GARP VLAN Registration 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 14 trunk groups, with 16 ports for each trunk
  - Up to 80Gbps bandwidth (full duplex mode)
- Provides port mirror (many-to-1)
- Port mirroring to monitor the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops
- Link Layer Discovery Protocol (LLDP)
- 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
- Supports G.8032 ERPS (Ethernet Ring Protection Switching)
- IEEE 1588v2 TC and Synchronous Ethernet network timing

### 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

### 1588 Time Protocol for Industrial Computing Networks

The IGS-6325 Series is ideal for telecom and carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.



### Redundant Power to Ensure Continuous Operation

The IGS-6325 DIN-rail series possesses dual **DC 9/12-48V** and **AC 24V** 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.

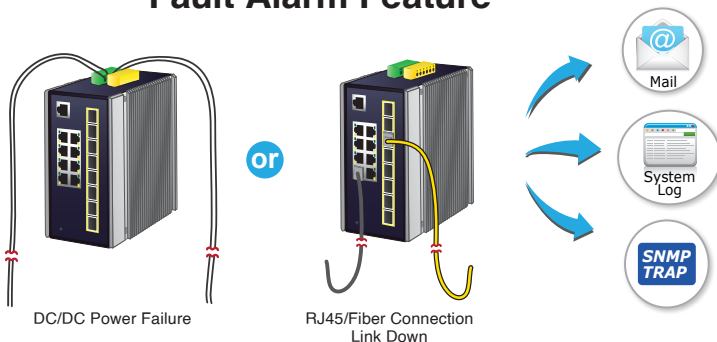
### SMTP/SNMP Trap Event Alert

The IGS-6325 Series provides event alert function to help to diagnose the abnormal device owing to whether or not there is a break of the network connection, or the rebooting response.

### Effective Alarm Alert for Better Protection

The IGS-6325 Series 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.

## Fault Alarm Feature



- MVR (Multicast VLAN Registration)

### 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 on the switch port
- DSCP remarking
- Voice VLAN

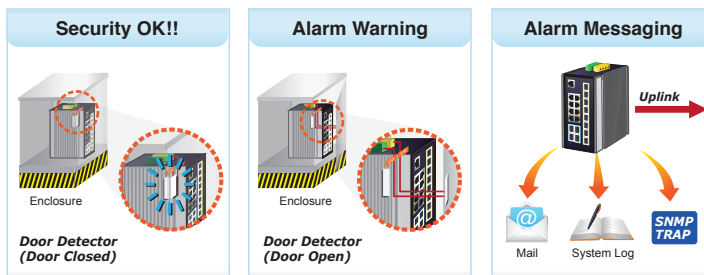
### Security

- 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
  - Guest VLAN assigns clients to a restricted VLAN with limited services
- 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

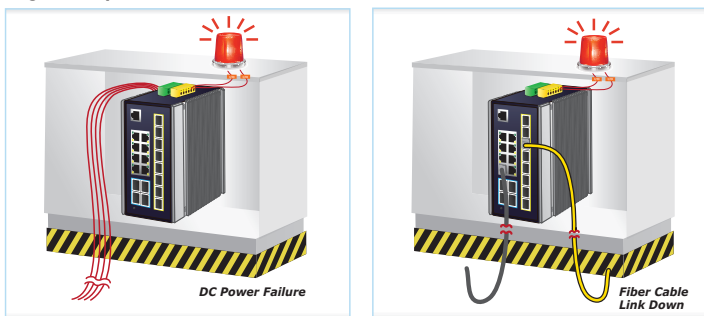
### Digital Input and Digital Output for External Alarm

The IGS-6325 Series supports Digital Input and Digital Output on its front panel. This external alarm enables users to use Digital Input to detect and log external device status (such as door intrusion detector), and send event alarm to the administrators. The Digital Output could be used to alarm the administrators if the IGS-6325 Series' port shows link down, link up or power failure.

#### Digital Input



#### Digital Output

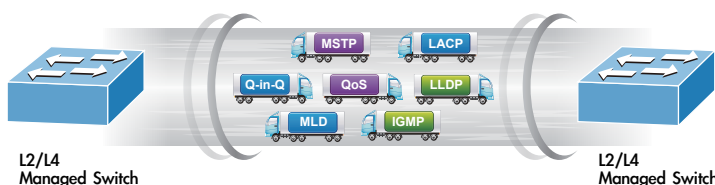


### IPv6/IPv4 Dual Stack

Supporting both IPv6 and IPv4 protocols, the IGS-6325 Series 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.

### Robust Layer 2 Features

The IGS-6325 Series can be programmed for advanced Layer 2 switch management functions such as dynamic port link aggregation, 802.1Q tagged VLAN, Q-in-Q VLAN, private VLAN, Multiple Spanning Tree Protocol (MSTP), Layer 2 to Layer 4 QoS, bandwidth control, IGMP snooping and MLD snooping. Via the aggregation of supporting ports, the IGS-6325 Series allows the operation of a high-speed trunk group that comes with multiple ports and supports fail-over as well.



### Management

- IPv4 and IPv6 dual stack management
- Switch Management Interfaces
  - Console and Telnet Command Line Interface
  - HTTP web switch management
  - SNMP v1 and v2c switch management
  - SSH, TLS, SSL and SNMP v3 secure access
- SNMP Management
  - Four RMON groups (history, statistics, alarms, and events)
  - SNMP trap for interface Link Up and Link Down notification
- IPv6 IP address/NTP/DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- System Maintenance
  - Firmware upload/download via HTTP
  - Reset button for system reboot or reset to factory default
  - Dual images
- DHCP Relay
- DHCP Option 82
- DHCP Server
- User Privilege levels control
- Network Time Protocol (NTP)
- 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
- System Log
- PLANET NMS System and Smart Discovery Utility for deployment management

### Efficient Management

For efficient management, the IGS-6325 Series is equipped with console, Web and SNMP management interfaces.

- With the built-in **Web-based** management interface, the IGS-6325 series offers an easy-to-use, platform-independent management and configuration facility.
- For **text-based** management, it can be accessed via Telnet and the console port.
- For standard-based monitor and management software, it offers SNMPv3 connection which encrypts the packet content at each session for secure remote management

### Powerful Network Security

The IGS-6325 Series offers 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.

### Advanced IP Network Protection

The IGS-6325 Series 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-6325 Series 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.

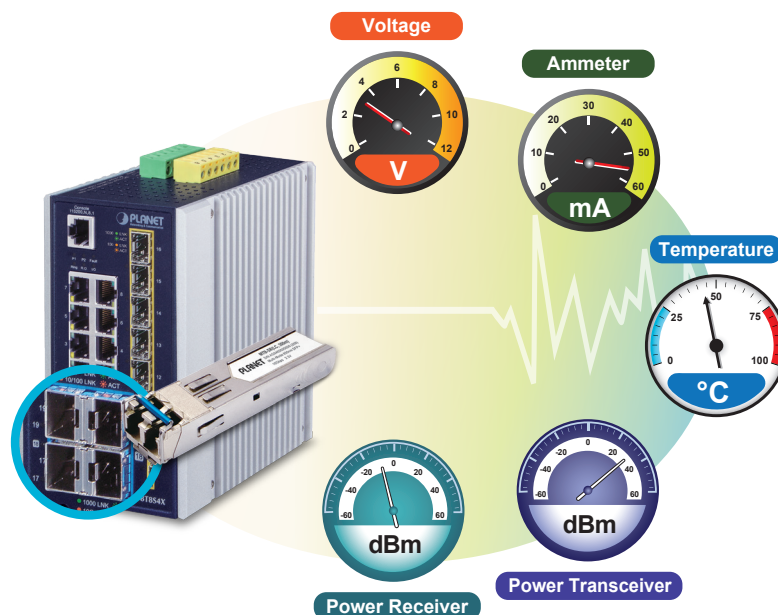
### Flexible and Extendable 10Gb Ethernet Solution

10G Ethernet is a big leap in the evolution of Ethernet. Each of the 10G SFP+ slots in the IGS-6325 Series supports **dual speed** and **10GBASE-SR/LR** or **1000BASE-SX/LX**. With its 4-port, 10G Ethernet link capability and additional 8-port 1G Ethernet link capability, the administrator now can flexibly choose the suitable SFP/SFP+ transceiver according to the transmission distance or the transmission speed required to extend the network efficiently. The IGS-6325 Series provides broad bandwidth and powerful processing capacity.

### Intelligent SFP Diagnosis Mechanism

The IGS-6325 Series 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)



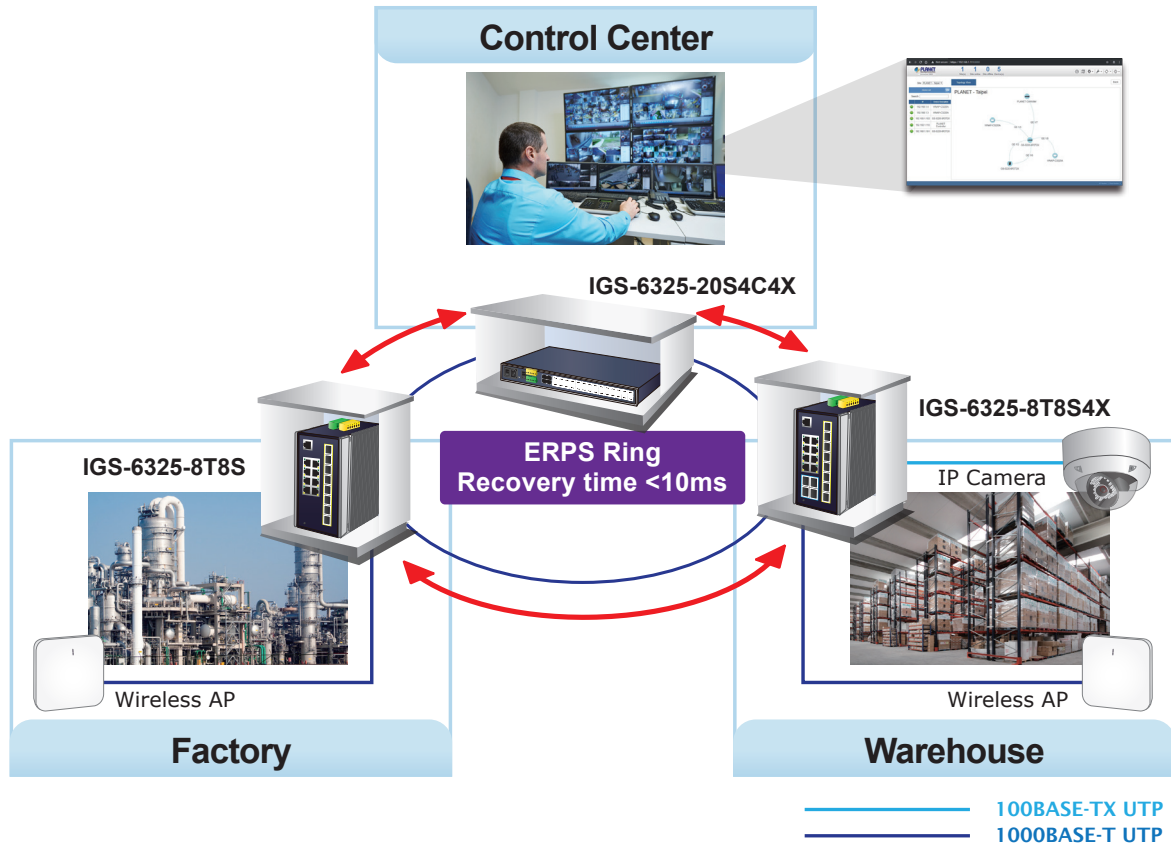


## Applications

### High Availability Mesh Networking Solution for Big Data System

To improve the technology of Optical Fiber Ethernet with highly-flexible, highly-extendable and easy-to-install features, the IGS-6325 Series offers up to **112Gbps** data exchange speed via Optical Fiber interface and the transmission distance can be extended to 120km.

The IGS-6325 Series features strong, rapid, self-recovery capability to prevent interruptions and external intrusions. It incorporates **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** into customer's automation network to enhance system reliability and uptime. The IGS-6325 DIN-rail series is the ideal solution for data centers, service providers and telecoms to build redundant connection and establish high bandwidth for Big Data server farm.



### Layer 3 VLAN Routing

With the built-in, robust Layer 3 routing protocols, the IGS-6325 Series ensures reliable routing between VLANs and network segments. The routing protocols can be applied by VLAN interface with up to 128 routing entries. The IGS-6325 Series, certainly an ideal solution for industries, offers greater security, control and bandwidth conservation, and high-speed uplink.

## Specifications

Product	IGS-6325-16T4S	IGS-6325-8T8S	IGS-6325-8T8S4X	IGS-6325-8T4X	
<b>Hardware Specifications</b>					
Copper Ports	16 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports	8 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports			
SFP Ports	4 100/1000BASE-X SFP slots	8 100/1000BASE-X SFP slots		--	
SFP+ Ports	--	--	4 10GbBASE-SR/LR SFP+ slot interfaces Compatible with 1000BASE-SX/LX/BX SFP transceiver		
Console	1 x RJ45-to-RS232 serial port (115200, 8, N, 1)				
Reset Button	< 5 sec: System reboot > 5 sec: Factory default				
Connector	Removable 6-pin terminal block for power input Pin 1/2 for Power 1, Pin 3/4 for fault alarm, Pin 5/6 for Power 2 Removable 6-pin terminal block for DI/DO interface Pin 1/2 for DI 1 & 2, Pin 3/4 for DO 1 & 2, Pin 5/6 for GND				
Alarm	One relay output for power failure. Alarm relay current carry ability: 1A @ 24V DC				
Digital Input (DI)	2 digital input: Level 0: -24~2.1V ( $\pm 0.1V$ ) Level 1: 2.1~24V ( $\pm 0.1V$ ) Input load to 24V DC, 10mA max.				
Digital Output (DO)	2 digital output: Open collector to 24VDC, 100mA				
Enclosure	IP30 aluminum case				
Installation	DIN-rail or wall mounting				
Dimensions (W x D x H)	76 x 107 x 152 mm				
Weight	1,168g	1,065g	1,250g	1,020g	
Power Requirements	DC 9~48V, 4A max.		DC 12~48V, 4A max.		
	AC 24V, 1.5A max.				
Power Consumption	DC input	Max. 10 watts/35BTU (system on) Max. 29 watts/99 BTU (Full loading)	Max. 9.12 watts/32BTU (system on) Max. 26.04 watts/89 BTU (Full loading)	Max. 12 watts/41BTU (system on) Max. 38.4 watts/132 BTU (Full loading)	Max. 10 watts/35BTU (system on) Max. 29 watts/99 BTU (Full loading)
	AC input	Max. 12 watts/41BTU (system on) Max. 30 watts/103 BTU (Full loading)	Max. 12 watts/41BTU (system on)Max. 29 watts/99 BTU (Full loading)	Max. 13 watts/45BTU (system on) Max. 38 watts/130 BTU (Full loading)	Max. 12 watts/41BTU (system on) Max. 30 watts/103 BTU (Full loading)
ESD Protection	6KV DC				
Surge Protection	4KV DC				
LED Indicators	System: Power 1 (Green), Power 2 (Green) Fault Alarm (Red) Ring (Green), Ring Owner (Green) DIDO (Red) Per 10/100/1000T RJ45 Port: 1000Mbps LNK/ACT (Green) 10/100Mbps LNK/ACT (Amber) Per SFP Port: 1000Mbps LNK/ACT (Green) 100Mbps LNK/ACT (Amber) Per SFP+ Port: 10Gbps LNK/ACT (Green) 1Gbps LNK/ACT (Amber)				
SDRAM	512Mbytes				
Flash Memory	64Mbytes				
<b>Switch Performance</b>					
Switch Fabric	40Gbps/non-blocking	32Gbps/non-blocking	112Gbps/non-blocking	96Gbps/non-blocking	
Throughput	29.76Mpps@64Bytes	23.81Mpps@64Bytes	83.33Mpps@64Bytes	71.43Mpps@64Bytes	
Switch Architecture	Store-and-Forward				
Address Table	16K entries, automatic source address learning and aging				
Shared Data Buffer	32Mbits				
Jumbo Frame	10K bytes				

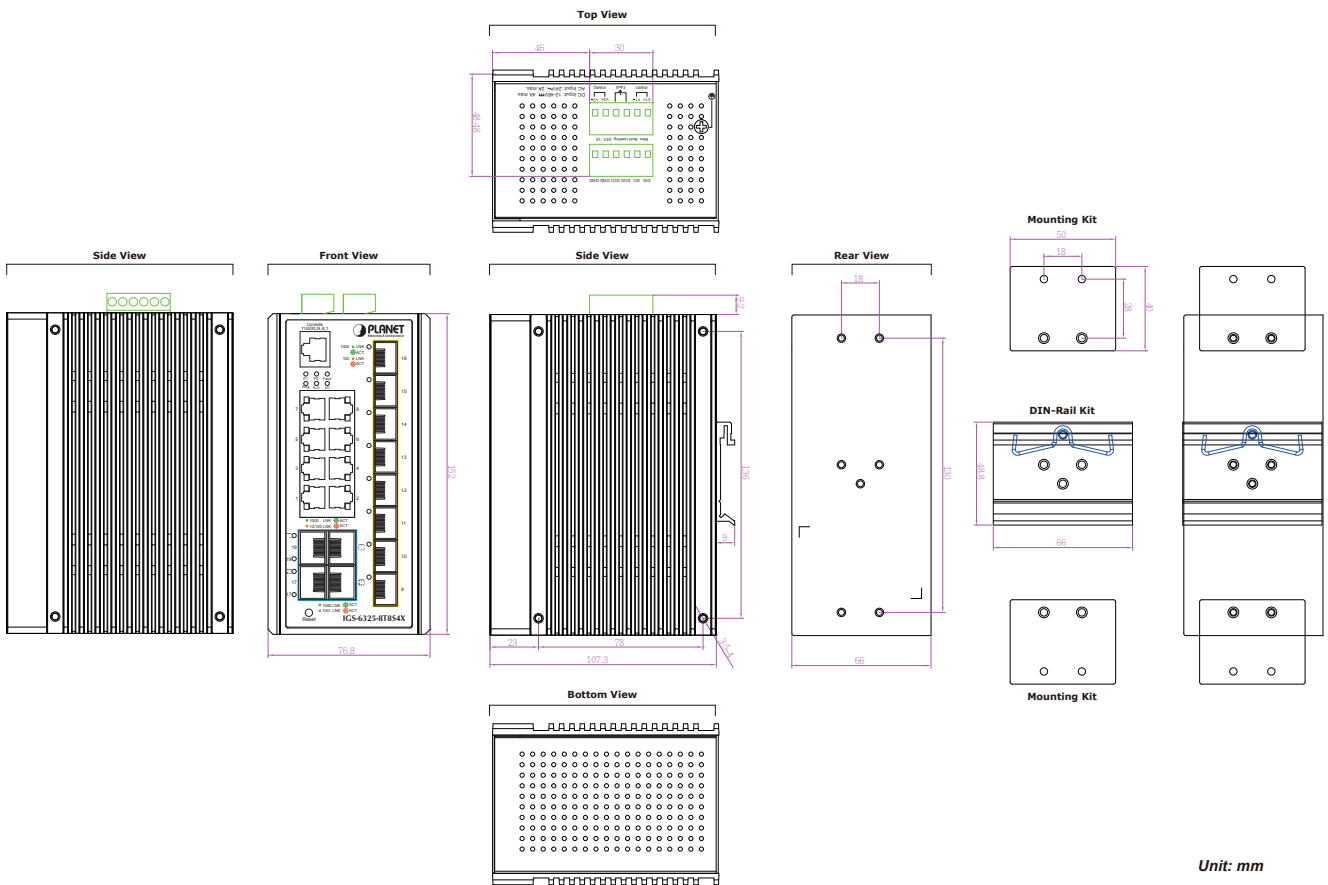
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
<b>Layer 2 Management Functions</b>	
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable Port link capability control
Port Status	Display 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 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) GVRP Up to 256 VLAN groups, out of 4095 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk 14 trunk groups with 16 port 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
IGMP Snooping	IPv4 IGMP (v1/v2/v3) snooping IPv4 IGMP querier mode support Supports 255 IGMP groups
MLD Snooping	IPv6 MLD (v1/v2) snooping, IPv6 MLD querier mode support Supports 255 MLD groups
Access Control List	IP-based ACL/MAC-based ACL ACL based on: - MAC Address - IP Address - Ethertype - Protocol Type - VLAN ID - DSCP - 802.1p Priority Up to 256 entries
Bandwidth Control	Per port bandwidth control Ingress: 100Kbps~1000Mbps Egress: 100Kbps~1000Mbps
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
Synchronization	IEEE 1588v2 PTP(Precision Time Protocol) - Peer-to-peer transparent clock - End-to-end transparent clock
<b>Layer 3 Functions</b>	
IP Interfaces	Max. 128 VLAN interfaces
Routing Table	Max. 128 routing entries
Routing Protocols	IPv4 hardware static routing IPv6 hardware static routing OSPFv2 dynamic routing
<b>Management</b>	
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSHv2, TLS v1.1/v1.2, SSL, SNMPv3



System Management	<p>Firmware upgrade by HTTP protocol through Ethernet network            Configuration upload/download through HTTP            Remote Syslog            System log            LLDP protocol            NTP            PLANET NMS System and Smart Discovery Utility</p>
SNMP MIBs	<p>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 (Group 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</p>
<b>Standards Conformance</b>	
Regulatory Compliance	<p>FCC Part 15 Class A            CE:            EN55032            EN55035</p>
Stability Testing	<p>IEC60068-2-32 (free fall)            IEC60068-2-27 (shock)            IEC60068-2-6 (vibration)</p>
Standards Compliance	<p>IEEE 802.3 10BASE-T            IEEE 802.3u 100BASE-TX/100BASE-FX            IEEE 802.3z Gigabit SX/LX            IEEE 802.3ab Gigabit 1000T            IEEE 802.3ae 10Gb/s Ethernet            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 802.3ah OAM            IEEE 802.1ag Connectivity Fault Management (CFM)            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            RFC 2328 OSPF v2            ITU-T G.8032 ERPS Ring            ITU-T Y.1731 Performance Monitoring</p>
<b>Standards Conformance</b>	
Operating	-40 ~ 75 degrees C
Storage	-40 ~ 85 degrees C
Humidity	5 ~ 95% (non-condensing)

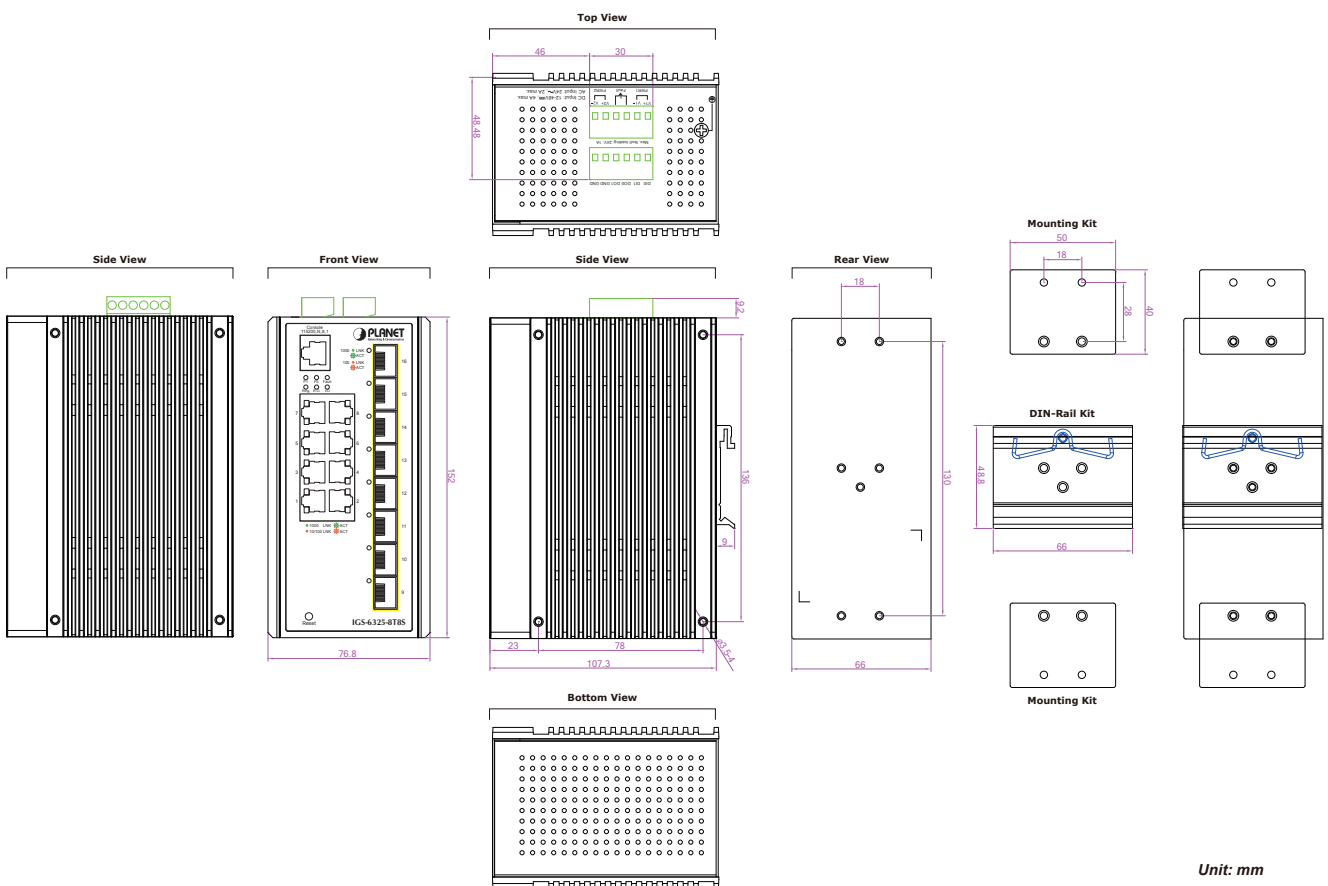
## Dimensions

### ■ IGS-6325-8T8S4X



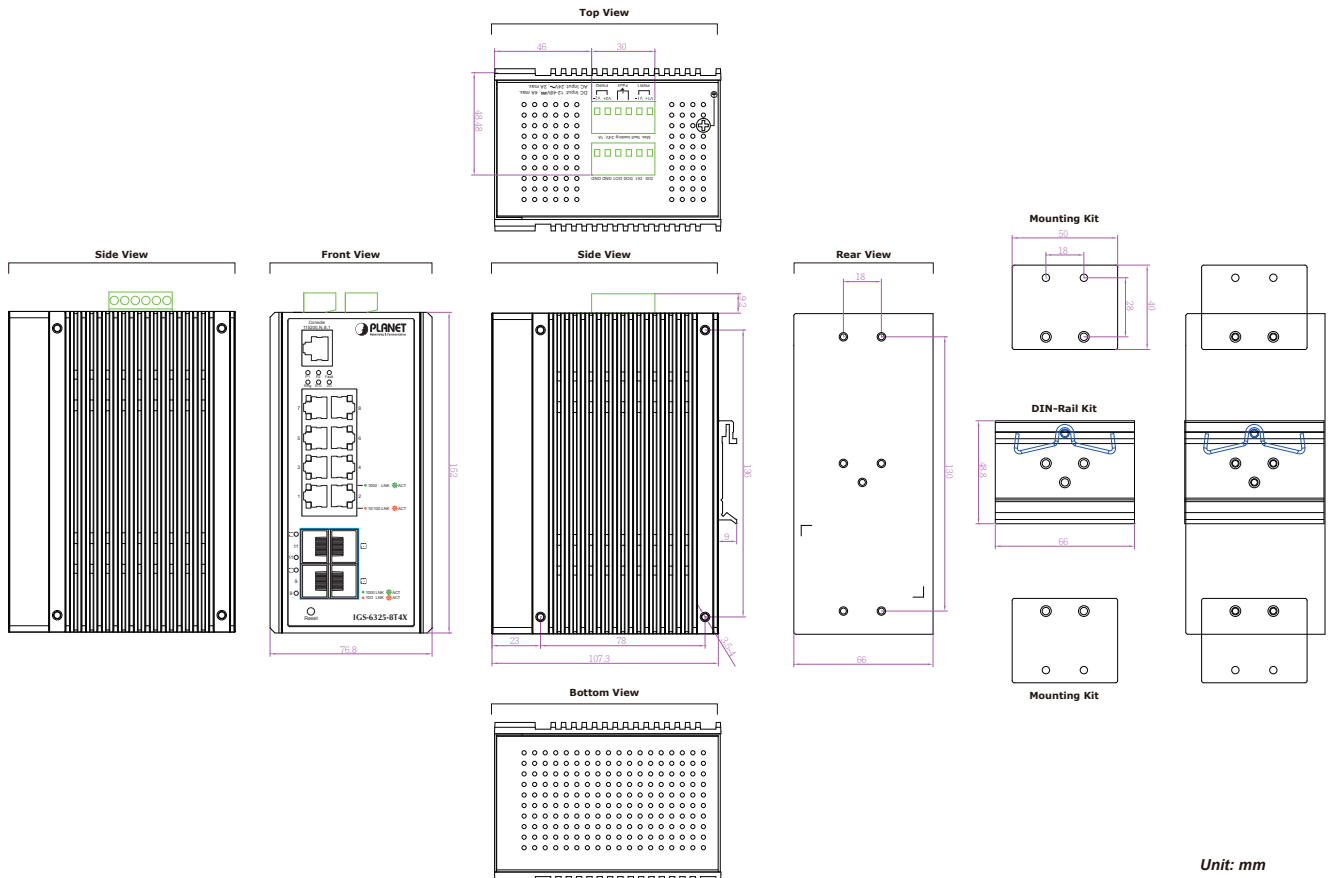
Unit: mm

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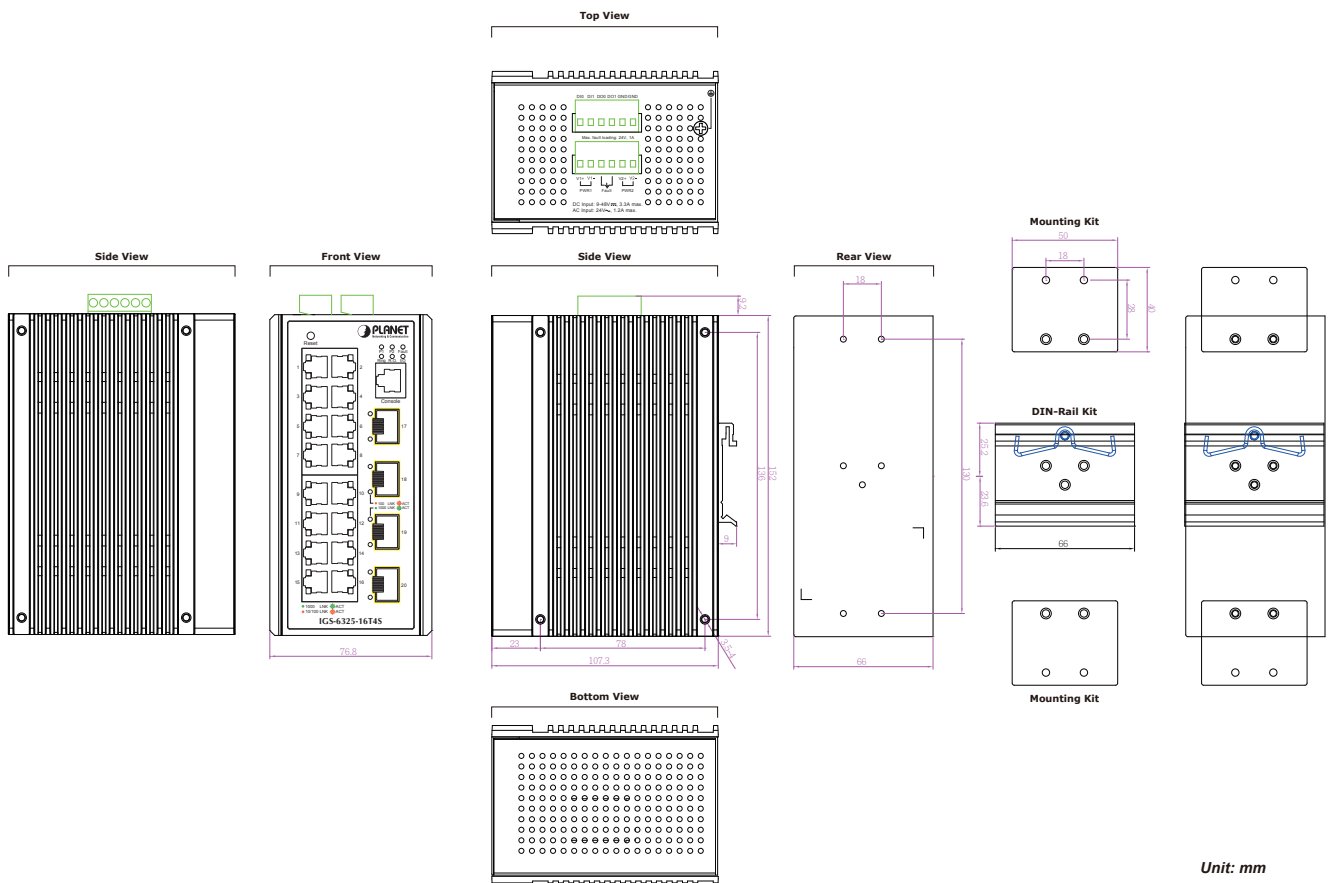
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■ IGS-6325-8T4X



Unit: mm

■ IGS-6325-16T4S



Unit: mm

## Ordering Information

IGS-6325-8T8S4X	Industrial L3 8-Port 10/100/1000T + 8-Port 100/1000X SFP + 4-Port 10G SFP+ Managed Ethernet Switch
IGS-6325-8T8S	Industrial L3 8-Port 10/100/1000T + 8-Port 100/1000X SFP Managed Ethernet Switch
IGS-6325-8T4X	Industrial L3 8-Port 10/100/1000T + 4-Port 10G SFP+ Managed Ethernet Switch
IGS-6325-16T4S	Industrial L3 16-Port 10/100/1000T + 4-Port 100/1000X SFP Managed Ethernet Switch

## Related Products

IGS-6325-20T4C4X	Industrial L3 20-Port 10/100/1000T + 4-Port Gigabit TP/SFP + 4-Port 10G SFP+ Managed Ethernet Switch
IGS-6325-20S4C4X	Industrial L3 20-Port 100/1000X SFP + 4-Port Gigabit TP/SFP + 4-Port 10G SFP+ Managed Ethernet Switch
IGS-5225-8T2S2X	Industrial L3 8-Port 10/100/1000T + 2-Port 100/1000X SFP + 2-Port 10G SFP+ Managed Ethernet Switch
IGS-20040MT	Industrial L2+ 16-Port 10/100/1000T + 4-Port 100/1000X SFP Managed Ethernet Switch

## Available Modules for IGS-6325 DIN-rail series

CB-DASFP-0.5/2M	10G SFP+ Directly-attached Copper Cable (0.5/2M in length)
MTB-Series Module	10GBASE-LR/SR/BX/T Modules
MGB-Series Transceiver	1000BASE-SX/LX SFP Transceiver
MFB-Series Transceiver	100BASE-FX SFP Transceiver