

## Industrial Layer 3 4-Port 2.5GBASE-T + 2-Port 10GBASE-X SFP+ Managed Ethernet Switch



### 2.5Gbps Copper Ports and 10Gbps Fiber Ports Deliver Cost Effective High-Speed Networking

The IGS-6325-4T2X is among PLANET's first Industrial-grade, Multi-Gigabit Managed Ethernet Switch that features **four 2.5GBASE-T ports, two 10GBASE-X SFP+ ports** and **Layer 3 IP routing** in a rugged IP30 metal case for operating in remote areas stably within the temperature range from **-40 to 75 degrees C**.

With Multi-Gigabit Ethernet support, the IGS-6325-4T2X allows the use of the existing Cat5e and Cat6 cabling for higher speed connection but does not incur expenses and complexity brought by additional infrastructure. Once needed, the 10GBASE-X SFP+ ports can also offer even higher transmission speed and greater distance networking capability.



### 2.5GBASE-T and 10GBASE-X SFP Dual Media Interfaces for Diversified Bandwidth Applications

The IGS-6325-4T2X can be operated at the speed of 2.5Gbps over copper or fiber-optic cabling which helps to accelerate the performance of large data transmission. The 2.5GBASE-T copper interfaces support 4-speed (2.5G/1G/100/10) auto-negotiation, and 2.5Gbps data transmission with the existing Cat5e and Cat6 UTP cabling, meaning the speed can be increased without extra costs. It can definitely give you the speed you demand and its Plug and Play makes installation effortless.

The fiber-optic 10GBASE-X SFP+ interfaces support triple speeds, 10GBASE-SR/LR, 2500BASE-X and 1000BASE-SX/LX, meaning the administrator now can flexibly choose the suitable SFP/SFP+ transceiver according to the transmission

### Physical Port

- 4 10/100/1G/2.5GBASE-T RJ45 copper ports
- 2 10GBASE-SR/LR SFP+ slots, compatible with 1G/2.5GBASE-X SFP
- 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 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

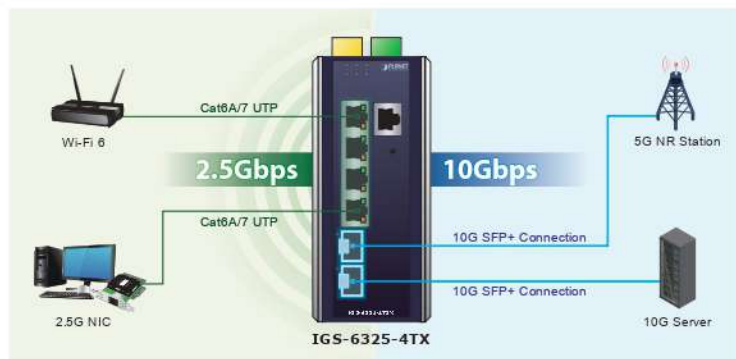
### Layer 3 IP Routing Features

- IPv4 dynamic routing protocol supports RIPv2 and OSPFv2
- IPv6 dynamic routing protocol supports OSPFv3
- 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
  - Broadcast/Multicast/Unknown unicast
- Supports **VLAN**

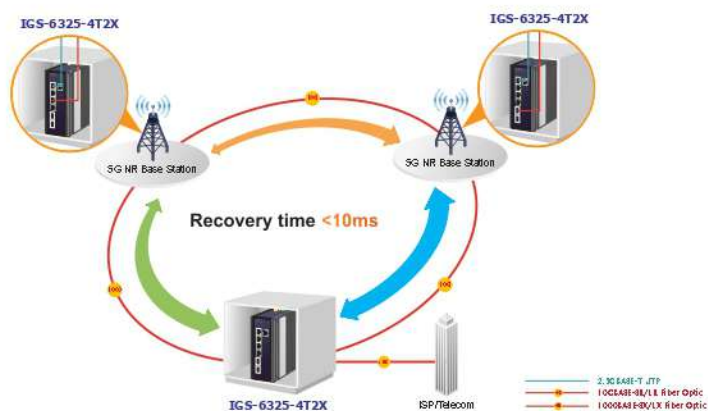
distance or the transmission speed required to extend the network efficiently. The IGS-6325-4T2X provides broad bandwidth and powerful processing capacity.



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

The IGS-6325-4T2X 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.

### ERPS Ring for Data Transmission Redundancy



### Layer 3 Routing Support

The IGS-6325-4T2X enables the administrator to conveniently boost network efficiency by configuring Layer 3 IPv4/IPv6 VLAN static routing manually, the RIP (Routing Information Protocol) or OSPF (Open Shortest Path First) settings automatically.

The RIP can employ the hop count as a routing metric and prevent routing loops by implementing a limit on the number of hops allowed in a path from the source to a destination.

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.

- IEEE 802.1Q tagged VLAN
- 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: 6 ports/3 groups max.)
  - Cisco ether-channel (static trunk: 6 ports/3 groups max.)
- 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 PTP (Precision Time Protocol) transparent clock mode

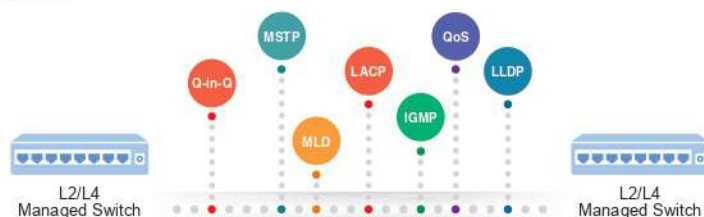
### Quality of Service

- 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 on the switch port
- DSCP remarking
- Voice VLAN



### Robust Layer 2 Features

The IGS-6325-4T2X 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-6325-4T2X allows the operation of a high-speed trunk group that comes with multiple ports and supports fail-over as well.



### Cybersecurity Network Solution to Minimize Security Risks

The IGS-6325-4T2X comes with enhanced cybersecurity to fend off cyberthreats and cyberattacks. It supports SSHv2 and TLSv1.2 protocols to provide strong protection against advanced threats. Served as a key point to transmit data over a long-distance fiber optic cable to customer's critical equipment in a business network, the cybersecurity feature of the IGS-6325-4T2X 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-6325-4T2X 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.

### 1588 Time Protocol for Industrial Computing Networks

The IGS-6325-4T2X is ideal for telecom and carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.

### 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
- 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
  - 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

### Management

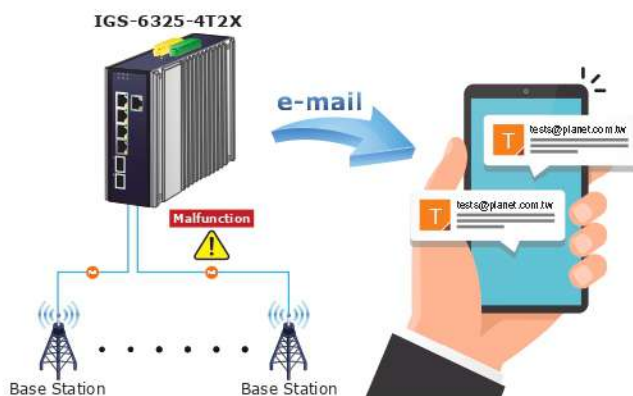
- IPv4 and IPv6 dual stack management
- Switch Management Interfaces
  - Console and Telnet Command Line Interface
  - HTTP web switch management
  - SNMP v1 and v2c switch management
  - SSHv2, TLSv1.2 and SNMPv3 secure access
- SNMP Management
  - Four RMON groups (history, statistics, alarms, and 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

## Time Synchronization in Network



### SMTP Event Alert

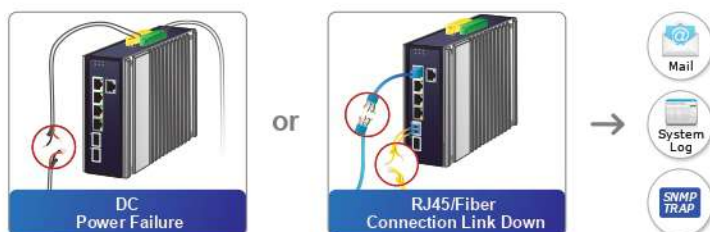
The IGS-6325-4T2X provides SMTP event alert function to help quickly determine whether a device malfunction results from a network disconnection, or a rebooting response.



### Effective Alarm Alert for Better Protection

The IGS-6325-4T2X 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 effort.

### Fault Alarm Feature



### Digital Input and Digital Output for External Alarm

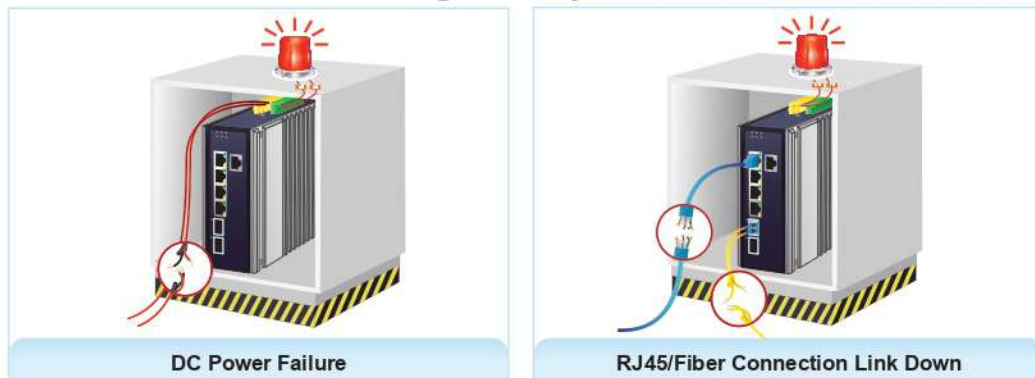
The IGS-6325-4T2X supports Digital Input and Digital Output on its front panel. This external alarm enables users to use Digital Input to detect and log external device status (such as door intrusion detector), and send event alarm to the administrators. The Digital Output could be used to inform the administrator the IGS-6325-4T2X's port status including link down, link up or power failure.

- Firmware upload/download via HTTP
- Reset button for system reboot or reset to factory default
- Dual images
- DHCP Functions:
  - DHCP Relay
  - DHCP Option82
  - DHCP Server
- User Privilege levels control
- Network Time Protocol (NTP)
- Network Diagnostic
  - SFP-DDM (Digital Diagnostic Monitor)
  - ICMPv6/ICMPv4 remote ping
- SMTP/Syslog remote alarm
- System Log
- PLANET Smart Discovery Utility for deployment management
- PLANET UNI-NMS (Universal Network Management) and CloudViewer app for deployment management

## Digital Input

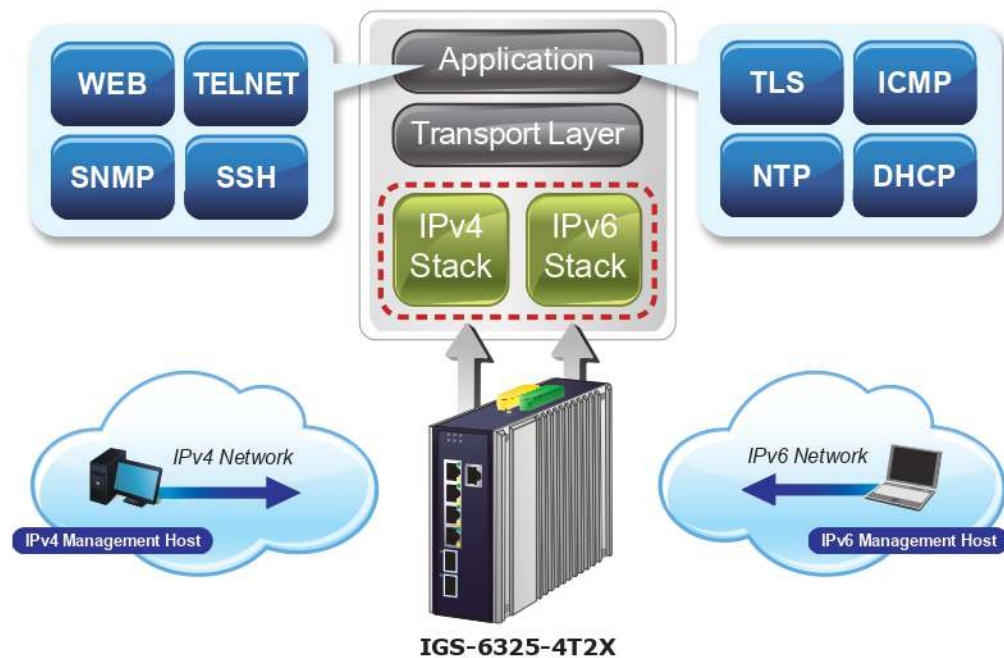


## Digital Output



### IPv6/IPv4 Dual Stack

Supporting both IPv6 and IPv4 protocols, the IGS-6325-4T2X 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.





### Efficient Management

For efficient management, the IGS-6325-4T2X is equipped with console, Web and SNMP management interfaces.

- With the built-in **Web-based** management interface, the IGS-6325-4T2X 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-6325-4T2X 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

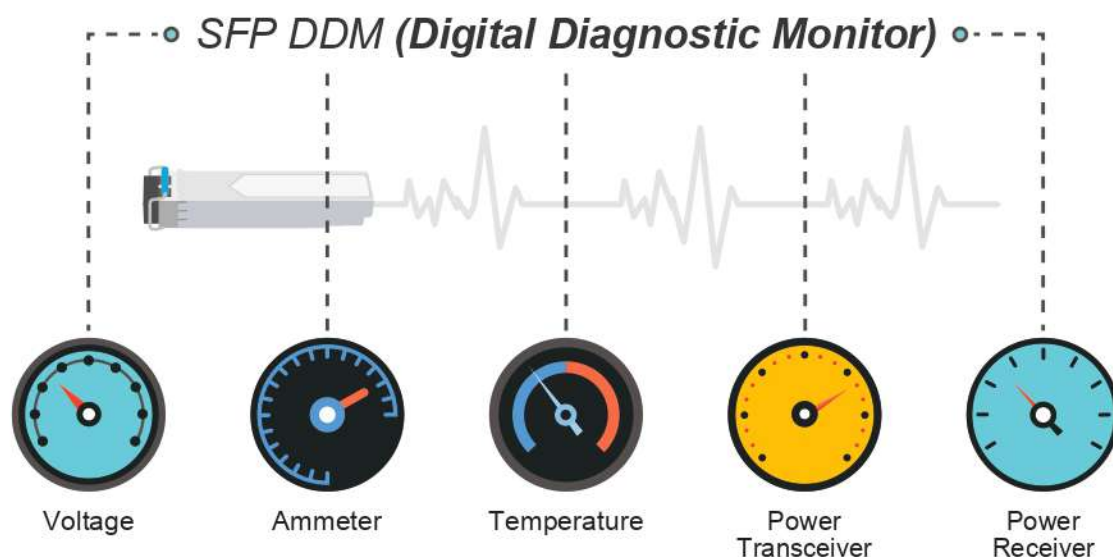
The IGS-6325-4T2X also provides **DHCP Snooping**, **IP Source Guard** and **Dynamic ARP Inspection** functions to prevent IP snooping from attack and discard ARP packets with invalid MAC address. The network administrators can now construct highly-secure corporate networks with considerably less time and effort than before.

### Excellent Traffic Control

The IGS-6325-4T2X 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.

### Intelligent SFP Diagnosis Mechanism

The IGS-6325-4T2X 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.

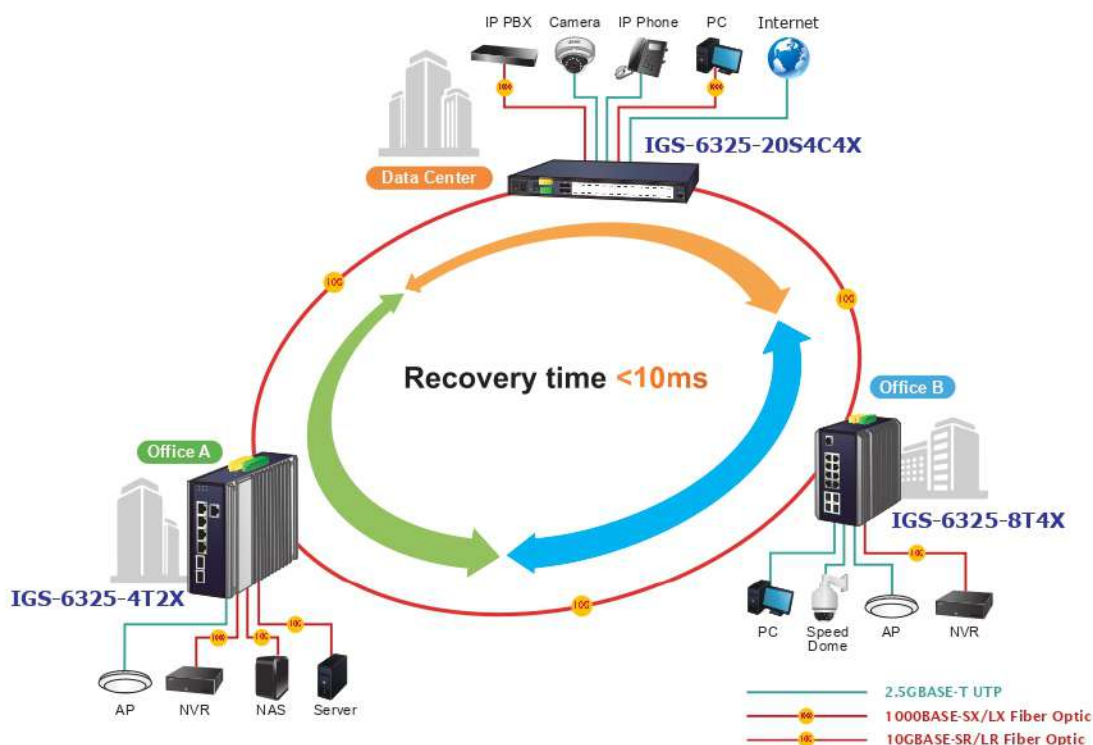


## Applications

### 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-6325-4T2X offers up to 60Gbps data exchange speed via copper over 100m or Optical Fiber interface and the transmission distance can be extended to 120km.

The IGS-6325-4T2X 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-6325-4T2X ensures reliable routing between VLANs and network segments. The routing protocols can be applied by VLAN interface with up to 32 routing entries. The IGS-6325-4T2X, certainly an ideal solution for industries, offers greater security, control and bandwidth conservation, and high-speed uplink.

## Specifications

Product	IGS-6325-4T2X
<b>Hardware Specifications</b>	
Copper Ports	4 2.5GBASE-T RJ45 auto negotiation port Supports 2.5G/1G/100/10Mbps data rate
SFP+ Ports	2 10GBASE-SR/LR SFP+ slots Backward compatible with 1000BASE-SX/LX/BX and 2500BASE-X SFP transceivers
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 @ 24VDC
Digital Input (DI)	2 digital inputs: Level 0: -24~2.1V ( $\pm 0.1V$ ) Level 1: 2.1~24V ( $\pm 0.1V$ ) Input load to 24VDC, 10mA max.
Digital Output (DO)	2 digital outputs: Open collector to 24VDC, 100mA
Enclosure	IP30 aluminum case
Installation	DIN-rail or wall mounting
SDRAM	512Mbytes
Flash Memory	64Mbytes
Dimensions (W x D x H)	60 x 135 x 135 mm
Weight	1,129g
Power Requirements	DC 9~48V, 3A max. AC 24V, 1.5A max.
Power Consumption	DC input: Max. 9.1 watts/31BTU (system on) Max. 22.5 watts/76.7BTU (Full loading) AC 24V input: Max. 8.9 watts/30.3BTU (system on) Max. 21.6 watts/73.6BTU (Full loading)
ESD Protection	6KVDC
Surge Protection	6KVDC
LED Indicators	System: Power 1 (Green), Power 2 (Green) Fault Alarm (Red) Ring (Green), Ring Owner (Green) DIDO (Red) Per 10/100/1G/2.5GBASE-T RJ45 Port: 1G/2.5G LNK/ACT (Green) 10/100 LNK/ACT (Amber) Per 1G/2.5G/10GBASE-X SFP+ Port: 1G/2.5Gbps LNK/ACT (Green) 10Gbps LNK/ACT (Amber)
<b>Switching Specifications</b>	
Switch Architecture	Store-and-Forward
Switch Fabric	60Gbps/non-blocking
Throughput	44.462Mpps@64Bytes
Address Table	8K 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 3 Functions</b>	
IP Interfaces	Max. 32 VLAN interfaces
Routing Table	Max. 32 static routing entries Max. 1K routing table entries



Routing Protocols	IPv4 RIPv2 IPv4 OSPFv2 IPv6 OSPFv3 IPv4 hardware static routing IPv6 hardware static routing
Layer 2 Functions	
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000/2500Mbps 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 RMirror – Remote Switched Port Analyzer (Cisco RSPAN) Supports up to 5 sessions
VLAN	IEEE 802.1Q tagged VLAN IEEE 802.1ad 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 4K VLAN groups, out of 4095 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk Max. 3 trunk groups with max. 6 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 Supports 7 MSTP instances BPDU Guard, BPDU filtering and BPDU transparent Root Guard
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
Bandwidth Control	Per port bandwidth control Ingress: 10Kbps~13128Mbps Egress: 10Kbps~13128Mbps
Ring	Supports ERPS, and complies with ITU-T G.8032 Recovery time < 10ms @ 3 nodes Recovery time < 50ms @ 16 nodes Supports Major ring and sub-ring
Synchronization	IEEE 1588v2 PTP(Precision Time Protocol) - Peer-to-peer transparent clock - End-to-end transparent clock
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

## Security Functions

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 512 entries
Security	Port security IP source guard, up to 512 entries Dynamic ARP inspection, up to 1K entries Command line authority control based on user level Static MAC address, up to 64 entries
AAA	RADIUS client TACACS+ client
Network Access Control	IEEE 802.1x port-based network access control MAC-based authentication Local/RADIUS authentication

## Management

Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSHv2, TLS v1.2, SNMPv3
System Management	Firmware upgrade by HTTP protocol through Ethernet network Configuration upload/download through HTTP Remote Syslog System log LLDP protocol NTP PLANET Smart Discovery Utility PLANET CloudViewer app
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 (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

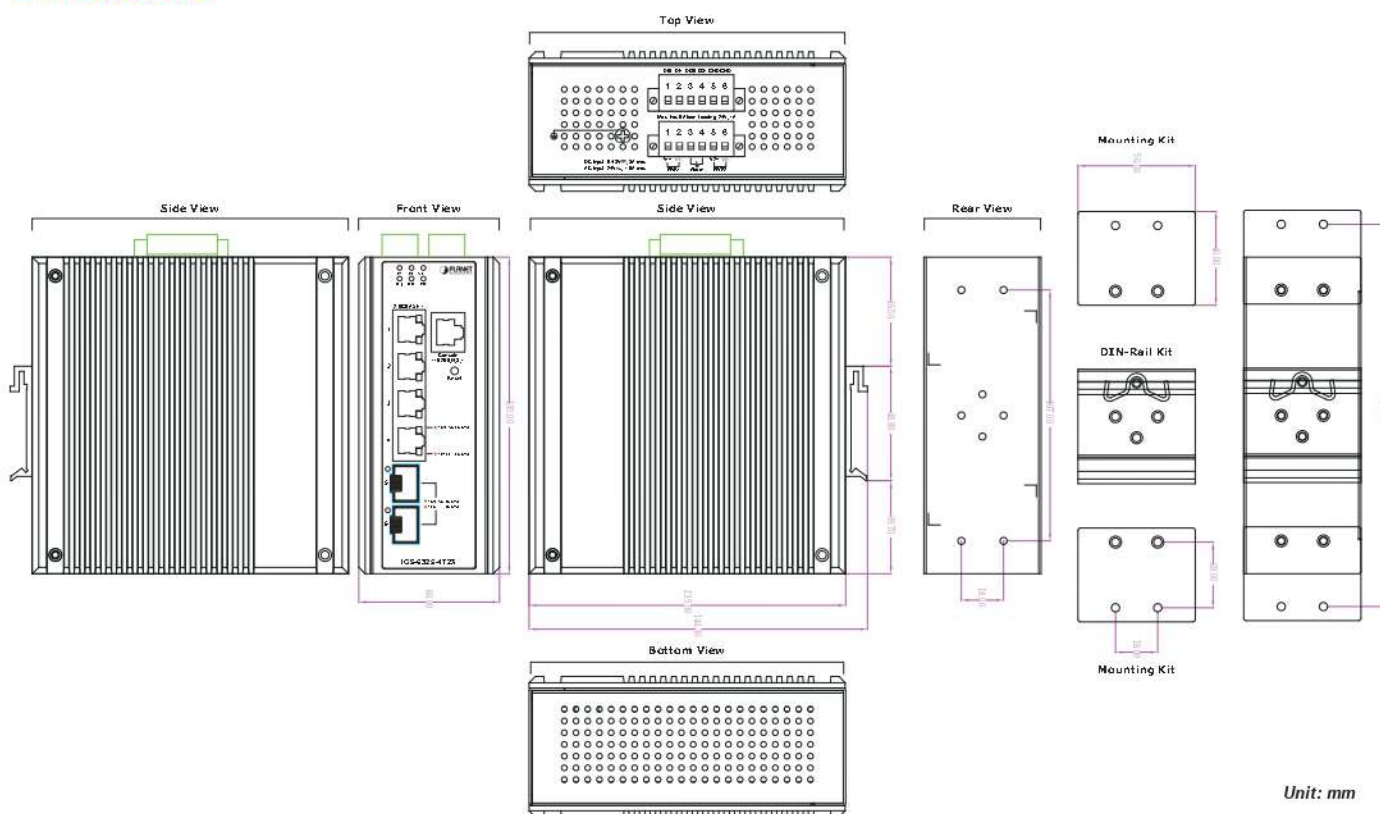
## Standards Conformance

Regulatory Compliance	FCC Part 15 Class A CE: EN55032 EN55035
Stability Testing	IEC60068-2-32 (free fall) IEC60068-2-27 (shock) IEC60068-2-6 (vibration)



Standards Compliance	IEEE 802.3z Gigabit SX/LX	RFC 768 UDP
	IEEE 802.3ab Gigabit 1000T	RFC 783 TFTP
	IEEE 802.3ae 10GBASE-X	RFC 791 IP
	IEEE 802.3bz 2.5/5GBASE-T	RFC 792 ICMP
	IEEE 802.3x flow control and back pressure	RFC 2068 HTTP
	IEEE 802.3ad port trunk with LACP	RFC 1112 IGMP v1
	IEEE 802.1D Spanning Tree Protocol	RFC 2236 IGMP v2
	IEEE 802.1w Rapid Spanning Tree Protocol	RFC 3376 IGMP v3
	IEEE 802.1s Multiple Spanning Tree Protocol	RFC 2710 MLD v1
	IEEE 802.1p Class of Service	RFC 3810 MLD v2
	IEEE 802.1Q VLAN tagging	RFC 2328 OSPF v2
	IEEE 802.1X Port Authentication Network Control	RFC 5340 OSPF v3
	IEEE 802.1ab LLDP	RFC 2453 RIP v2
	IEEE 802.3ah OAM	ITU-T G.8032 ERPS Ring
	IEEE 802.1ag Connectivity Fault Management (CFM)	
Environment		
Operating	-40 ~ 75 degrees C	
Storage	-40 ~ 85 degrees C	
Humidity	5 ~ 95% (non-condensing)	

## Dimensions



## Ordering Information

IGS-6325-4T2X

Industrial L3 4-Port 2.5GBASE-T + 2-Port 10GBASE-X SFP+ Managed Ethernet Switch

## Related Products

IGS-6325-5X1T	Industrial L3 5-Port 10GBASE-X SFP+ + 1-Port 10GBASE-T Managed Ethernet Switch
IGS-6325-8T4X	Industrial L3 8-Port 10/100/1000T + 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-6325-8T8S4X	Industrial L3 8-Port 10/100/1000T + 8-Port 100/1000X 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-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

## 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
MGB-2G Series Transceiver	2500BASE-X SFP Transceiver