Industrial L2+ 4-Port 10/100/1000T + 2-Port 1G/2.5G SFP Managed TSN Ethernet Switch

Innovative Industrial TSN Ethernet Switch Guarantees Delivery of Time-Sensitive Data

PLANET TSN-5225-4T2S is a brand-new Industrial-grade Layer 2+ **Time-Sensitive Networking (TSN)** Managed Ethernet Switch which features **4 10/100/1000BASE-T RJ45 ports** and **2 1G/2.5GBASE-X SFP ports** in a rugged IP30 metal case for stable operation in heavy environments, address all levels of the industrial automation network, from the field bus to the factory backbone. And it guarantees end-to-end transmission of high-priority traffic with extremely low latency. With **2 dual-speed SFP fiber slots**, it can be flexibly applied to extend the connection distance.

The TSN-5225-4T2S can be installed in any difficult environment as it can operate stably under the temperature range from **-40** to **75 degrees C**. It also allows either DIN-rail or wall mounting for efficient use of cabinet space.

Building a Sustainable Future for Innovation with ESG Principles

The TSN-5225-4T2S can help businesses achieve more efficient operations and production while reducing energy consumption and resource wastage, thereby enhancing both the economic and social benefits of the enterprise, aligning with the core values of ESG. For instance, the application of the TSN-5225-4T2S in industrial automation enables precise control of the manufacturing process, reducing energy consumption and waste generation. Similarly, their use in transportation can optimize logistics routes, mitigating issues such as carbon emissions and traffic congestion.

A Simplified Pathway to a TSN-compatible Infrastructure

PLANET TSN-5225-4T2S provides real-time, low-latency network communication for industrial automation, 5G NR networks, Industry 4.0, 4K/8K video streaming, and VR/AR gaming industry by using the **Time-sensitive Networking (TSN)** technology and **IEEE 1588 Precision Time Protocol (PTPv2)** for time synchronization on all ports.

The TSN-5225-4T2S supports TSN IEEE standards needed for a complete real-time communication solution. These include IEEE 802.1AS-REV profile for time synchronization, IEEE 802.1Qbv for Enhancements for Scheduled Traffic, IEEE 802.1Qbu Frame Preemption, IEEE 802.3br Interspersing Express Traffic (IET), IEEE 802.1Qci for per-stream filtering and policing (PSFP) and IEEE 802.1CB frame replication and elimination for reliability (FRER) for seamless redundancy.

Physical Port

- 4 10/100/1000BASE-T Gigabit Ethernet RJ45 ports
- 2 1000/2500BASE-X SFP slots for SFP type auto detection
- One RJ45 console interface for basic management and setup

Industrial Case and Installation

- 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
- IP30 metal case
- DIN-rail and wall-mount designs
- Supports 5000V 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

Time Sensitive Networking

- **High Precision Time Synchronization**
  - IEEE1588 (Time Stamping)
  - 802.1AS-Rev gPTP default profile
- **Shapers**
  - 802.1Qbv Enhancements for Scheduled Traffic
  - 802.1Qch (Cyclic Queuing and Forwarding)
- **TSN Stream Policing**
  - 802.1Qci (Per Stream Filtering and Policing)
- **Redundancy**
  - 802.1CB FRER for seamless redundancy
  - Also standard Linear and Ring protection
- **Delay Reduction**
 - IEEE 802.1Qbu Frame Preemption,

The TSN-5225-4T2S eliminates the need for separating information technology (IT) and operational technology (OT) Ethernet networks, providing a more ubiquitous approach to synchronization and precision timing for today's industrial automation systems.
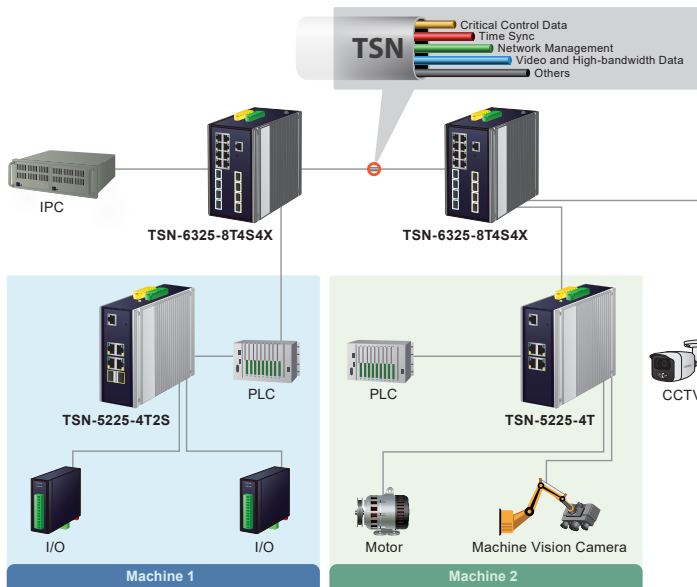
1588 Time Protocol for Industrial Computing Networks

The TSN-5225-4T2S features IEEE 1588v2 PTP (Precision Time Protocol) with hardware-based time stamping for precise time synchronization of networks, and support for **Boundary Clock**, **End to End** and **Peer to Peer Transparent Clock** modes. It is ideal for telecom and carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.

Time Synchronization in Network
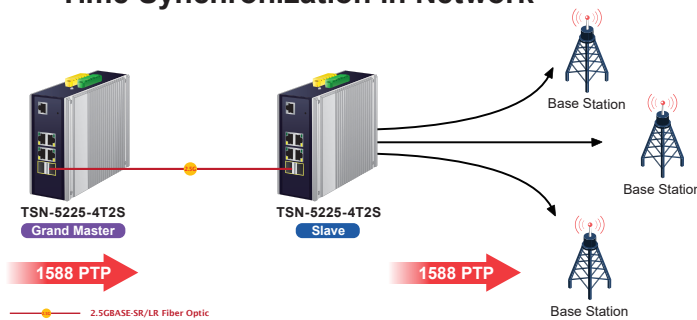
Redundant Ring, Fast Recovery for Critical Network Applications
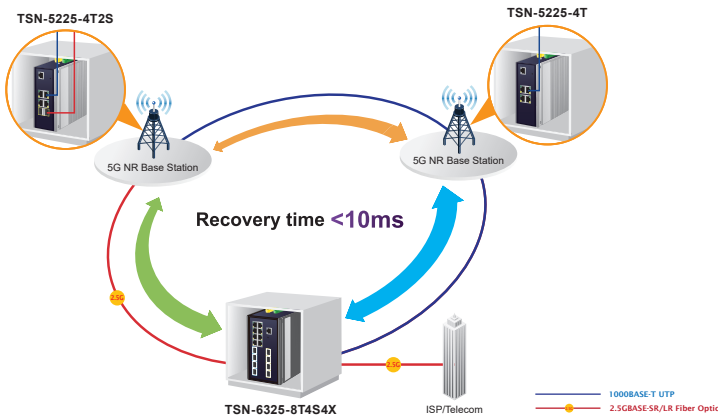
The TSN-5225-4T2S supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** technology, Spanning Tree Protocol (802.1s MSTP), and **redundant 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.

– IEEE 802.3br Interspersing Express Traffic (IET)

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/Unicast
- Supports **VLAN**
  – IEEE 802.1Q tagged VLAN
  – Supports provider Bridging (VLAN Q-in-Q, IEEE 802.1ad)
  – Private VLAN Edge (PVE)
  – Port Isolation
  – MAC-based VLAN
  – Protocol-based VLAN
  – Voice VLAN
  – VLAN Translation
  – 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**
  – 802.3ad Link Aggregation Control Protocol (LACP)
  – Cisco ether-channel (static trunk)
  – Maximum 3 trunk groups with 6 ports per trunk group
- 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
- Supports ERPS (Ethernet Ring Protection Switching)
- 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
- Link Layer Discovery Protocol (LLDP) and LLDP-MED

ERPS Ring for Data Transmission Redundancy

TSN-5225-4T2S
TSN-5225-4T
5G NR Base Station
5G NR Base Station
Recovery time **<10ms**
TSN-6325-8T4S4X
ISP/Telecom
1000BASE-T UTP
2.5GBASE-SR/LR Fiber Optic

Robust Layer 2 Features

The TSN-5225-4T2S 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 TSN-5225-4T2S allows the operation of a high-speed trunk group that comes with multiple ports and supports fail-over as well.

MSTP QoS Q-in-Q LACP LLDP MLD IGMP

L2/L4 Managed Switch

L2/L4 Managed Switch
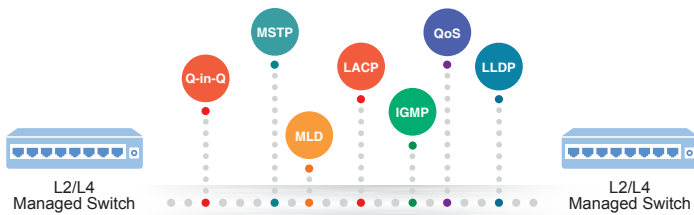
Cybersecurity Network Solution to Minimize Security Risks

The cybersecurity features that virtually need no effort and cost to have include the protection of the switch management and the enhanced security of the mission-critical network. Both SSHv2 and TLSv1.2 protocols are utilized to provide strong protection against advanced threats. The network administrator can now construct highly-secure corporate networks with considerably less time and effort than before.
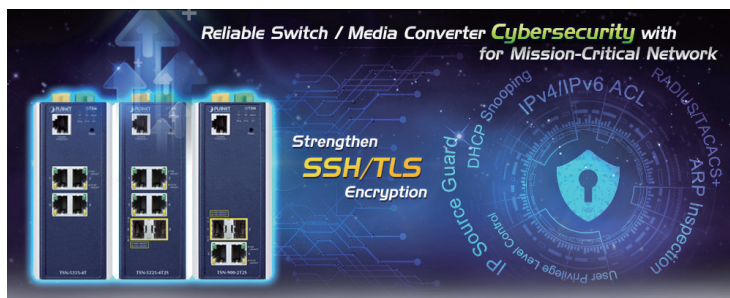
Layer 3 IP Routing Features

• Supports maximum 32 static routes and route summarization

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
  – IP TOS/DSCP/IP precedence
  – 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

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
  – 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

Modbus TCP Provides Flexible Network Connectivity for Factory Automation

With the supported **Modbus TCP/IP** protocol, the TSN-5225-4T2S 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.

SMTP/SNMP Trap Event Alert

The TSN-5225-4T2S 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.

TSN-5225-4T2S

e-mail

tests@planet.com.tw

Malfunction

tests@planet.com.tw

Base Station   Base Station
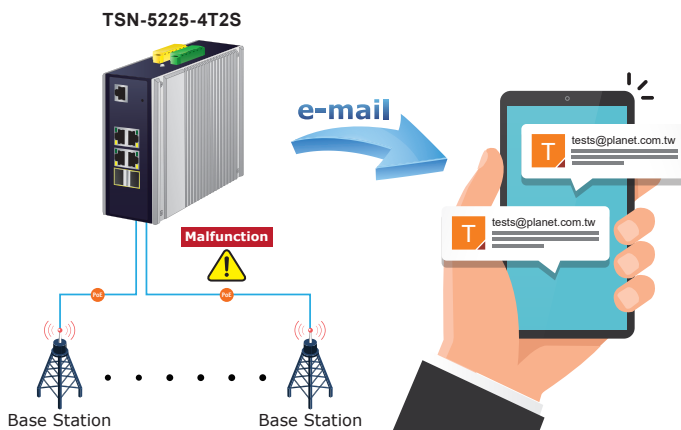
Effective Alarm Alert for Better Protection

The TSN-5225-4T2S 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

or

DC
Power Failure

RJ45/Fiber
Connection Link Down

Mail

System
Log

SNMP
TRAP
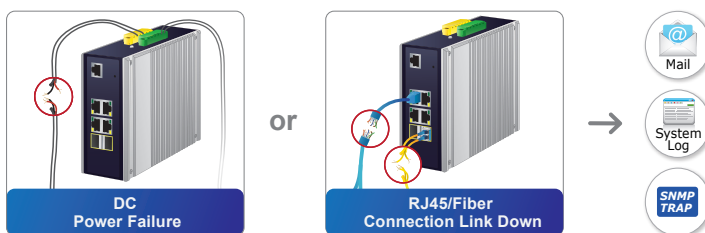
- **Dynamic ARP Inspection** discards ARP packets with invalid MAC address to IP address binding
- **IP Source Guard** prevents IP spoofing attacks
- IP address access management to prevent unauthorized intruder

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
  - SSHv2 and TLSv1.2 secure access
- **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
  - Configuration upload/download through HTTP
  - Reset button for system reboot or reset to factory default
  - Dual Images
- DHCP Relay
- DHCP Option82
- DHCP Server Mode support
- User Privilege levels control
- NTP (Network Time Protocol)
- Network Diagnostic
  - 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
- SFP-DDM (Digital Diagnostic Monitor)
- PLANET Smart Discovery Utility for deployment management
- PLANET NMS system and NMSViewerPro/CloudViewerPro for deployment management
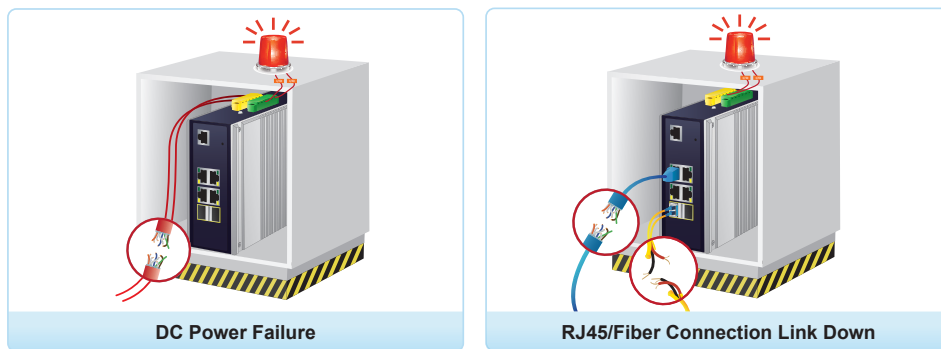
Digital Input and Digital Output for External Alarm

The TSN-5225-4T2S 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 TSN-5225-4T2S's port shows link down, link up or power failure.

Digital Input

Security OK!!	Alarm Warning	Alarm Messaging
Door Detector **(Closed)**	Door Detector **(Opened)**	Mail / System Log / SNMP TRAP — Uplink

Digital Output

DC Power Failure	RJ45/Fiber Connection Link Down

IPv6/IPv4 Dual Stack

Supporting both IPv6 and IPv4 protocols, the TSN-5225-4T2S 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.

WEB TELNET SNMP SSH

Application
Transport Layer
IPv4 Stack IPv6 Stack

TLS ICMP NTP DHCP

IPv4 Network — IPv4 Management Host
IPv6 Network — IPv6 Management Host
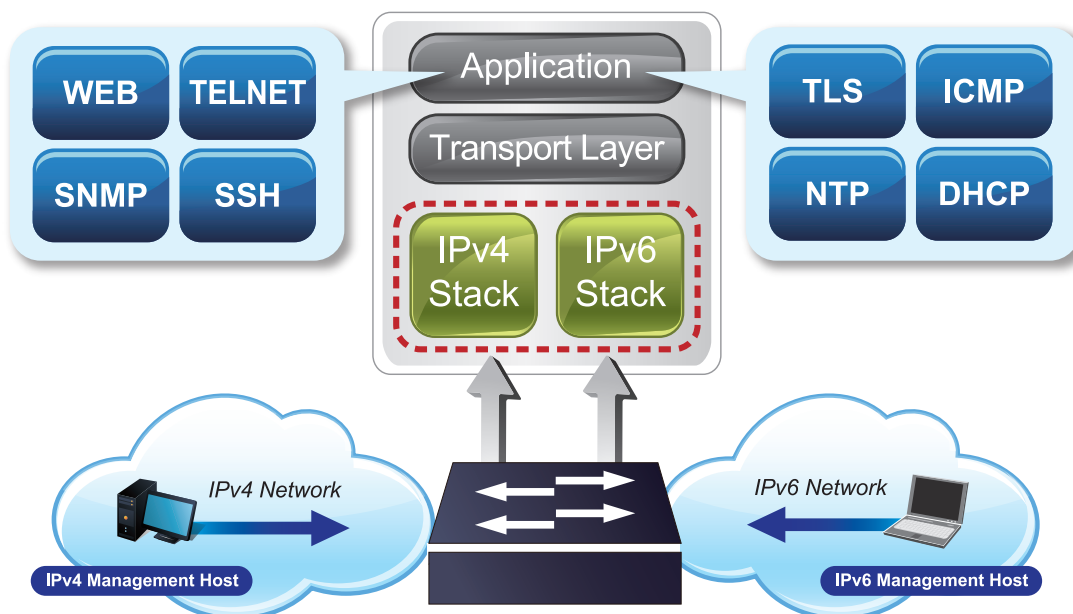
Efficient Management

For efficient management, the TSN-5225-4T2S is equipped with console, Web and SNMP management interfaces.

■ With the built-in **Web-based** management interface, the TSN-5225-4T2S 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.
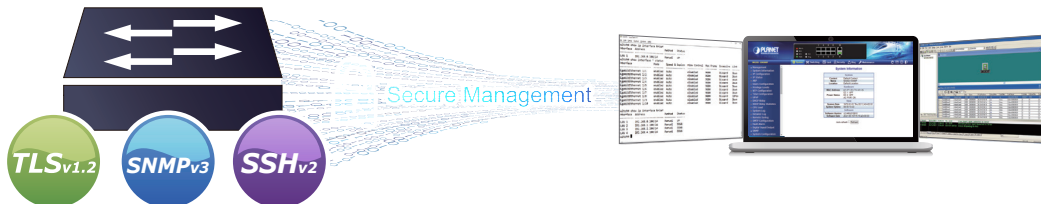
Powerful Network Security

The TSN-5225-4T2S 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 TSN-5225-4T2S 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 TSN-5225-4T2S 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 TSN-5225-4T2S 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.
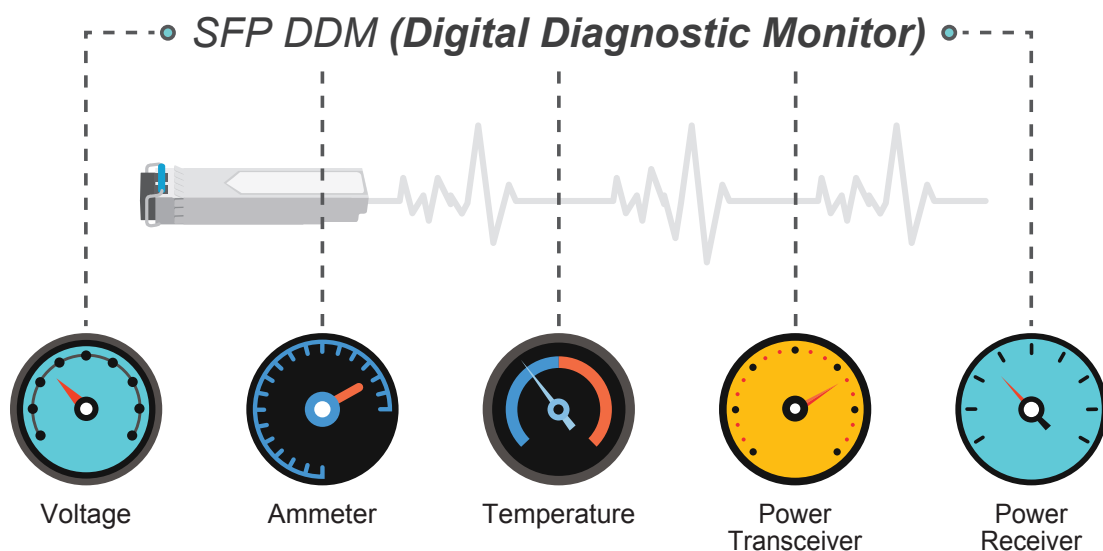
Layer 3 IPv4 and IPv6 Software VLAN Routing for Secure and Flexible Management

To help customers stay on top of their businesses, the TSN-5225-4T2S not only provides ultra high transmission performance and excellent Layer 2 technologies, but also IPv4/IPv6 software 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.

Remote Management Solution

PLANET's **Universal Network Management System** (UNI-NMS) and NMSViewerPro/CloudViewerPro app support IT staff by remotely managing all network devices and monitoring PDs' operational statuses. Thus, they're designed for both the enterprises and industries where deployments of PDs can be as remote as possible, without having to go to the actual location once a bug or faulty condition is found. With the UNI-NMS or NMSViewerPro/CloudViewerPro app, all kinds of businesses can now be speedily and efficiently managed from one platform.

NMS Controller   CloudViewerPro App

Flexibility and Extension Solution

The additional two mini-GBIC slots built in the TSN-5225-4T2S support triple-speed 1000/2500BASE-X SFP (small form-factor pluggable) fiber-optic modules, meaning the administrator now 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 300meters to 2km (multi-mode fiber) and to 10/20/30/40/60/70/80/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications within the enterprise data centers and distributions.

Applications

TSN Technology for Efficient Real-time Monitoring of Factory Production Processes

PLANET TSN-5225-4T2S, based on its advanced Time-Sensitive Networking (TSN) technology and utilizing IEEE 1588 Precision Time Protocol (PTPv2) for time synchronization on all ports, provides an efficient solution. Leveraging real-time data monitoring and low-latency data transmission advantages, it can be used for real-time monitoring and management of factory production processes. This system harnesses the performance of TSN to enhance production efficiency, optimize resources, and enable quick response to faults, making it a highly promising solution.
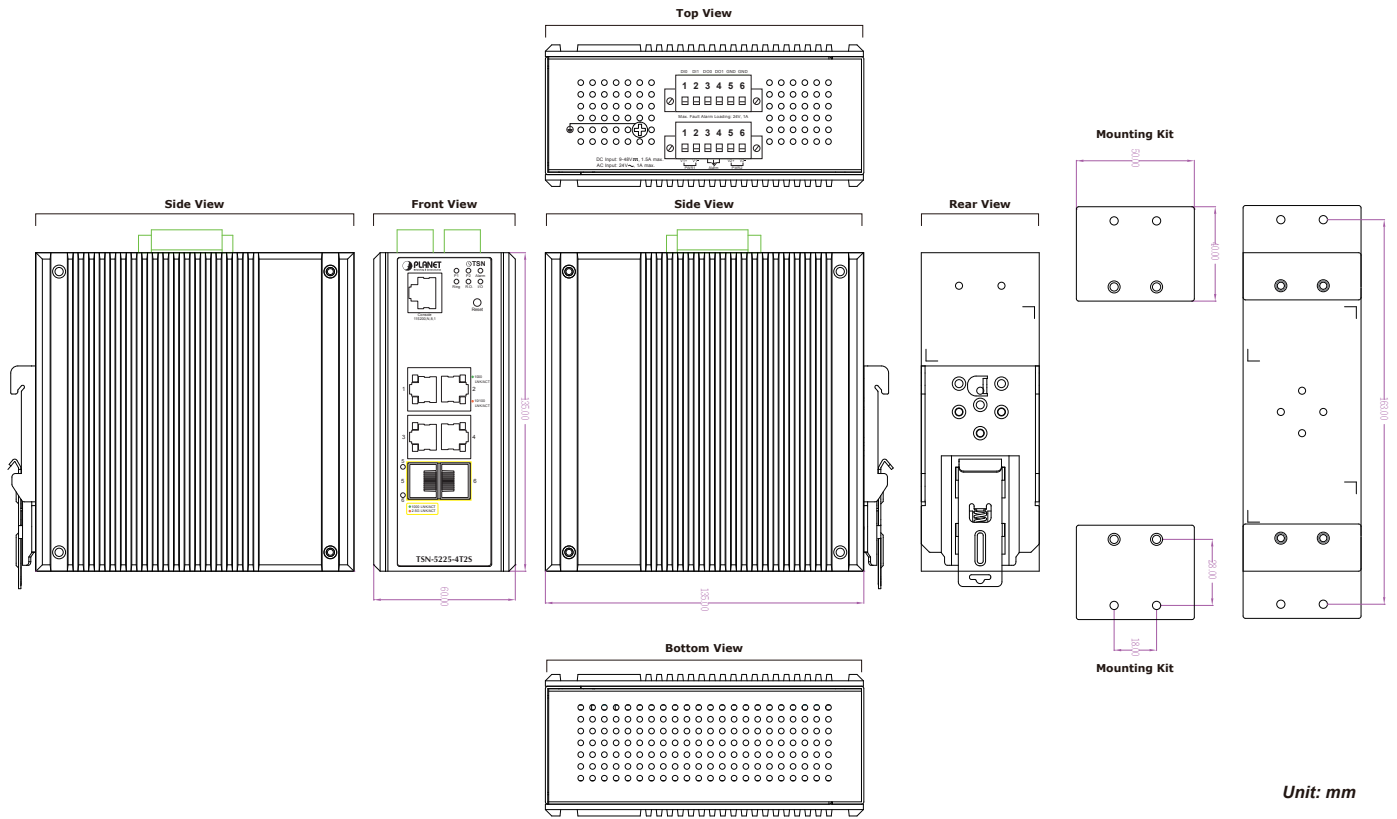

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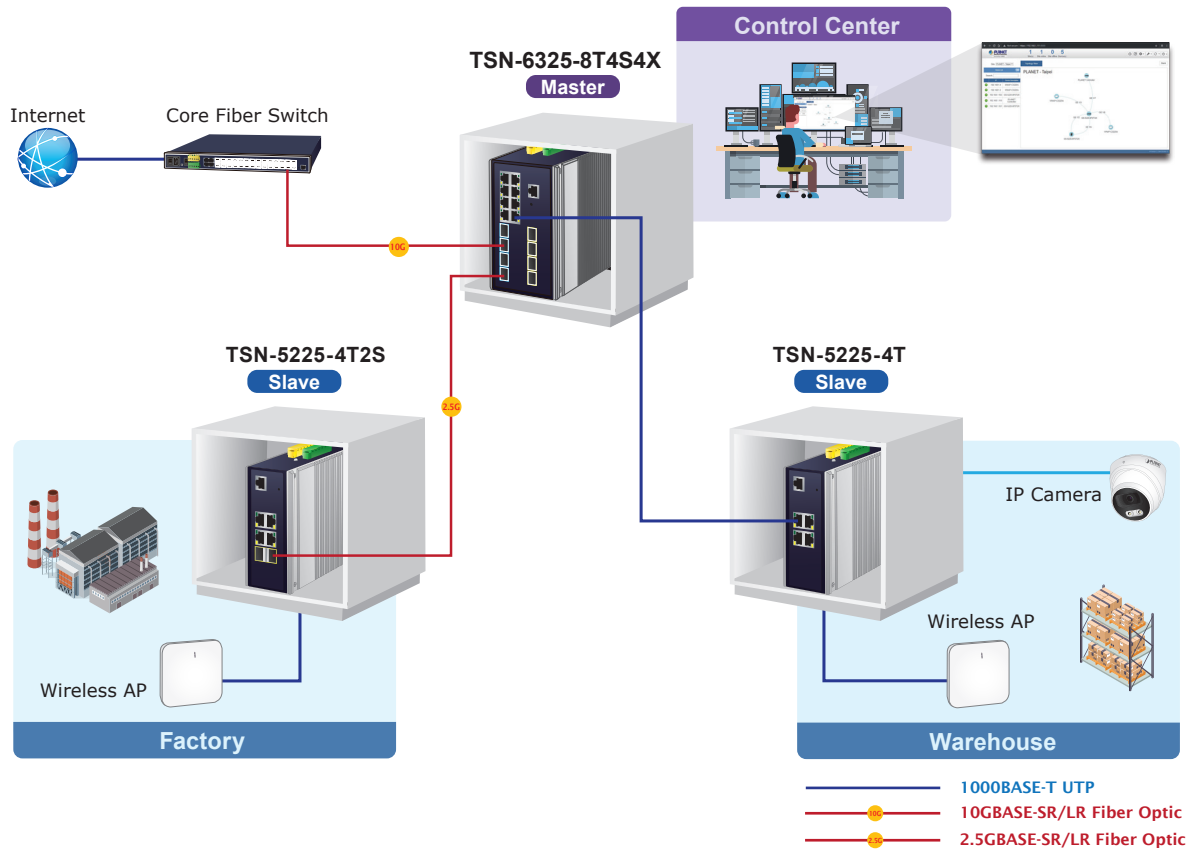
Specifications

Product	TSN-5225-4T2S
Hardware Specifications	
Copper Ports	4 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports
SFP Port	2 1000/2500BASE-X SFP ports (Ports 5 to 6)
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 (±0.1V)
	   Level 1: 2.1~24V (±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
SDRAM	1024Mbytes
Flash Memory	64Mbytes
Dimensions (W x D x H)	60 x 135 x 135 mm
Weight	986g
Power Requirements	DC 9~48V, 1.5A max. AC 24V, 1A max.
Power Consumption	DC input: Max. 6.05 watts/20.64BTU (system on) Max. 9.8 watts/33.44BTU (Full loading) AC 24V input: Max. 5.4 watts/18.43BTU (system on) Max. 9.2 watts/31.39BTU (Full loading)
ESD Protection	5KV DC
Surge Protection	6KV 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:
	   1Gbps LNK/ACT (Green)
	   2.5Gbps LNK/ACT (Amber)

Switching Specifications	
Switch Architecture	Store-and-Forward
Switch Fabric	18Gbps/non-blocking
Throughput	13.3Mpps@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
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

Layer 2 Functions	
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 Mirror – 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 4096 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk Maximum 3 trunk groups with 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 BPDU Guard, BPDU filtering and BPDU transparent
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: 100Kb~3276Mbps
	  Egress: 100Kb~3281Mbps

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)
	  - PTP Master
	  - PTP Slave
	  - Boundary clock
	  - Ordinary Clock
	  - Peer-to-peer transparent clock
	  - End-to-end transparent clock

QoS	Ingress Shaper and Egress Rate Limit per port bandwidth control
	8 priority queues on all switch ports
	Traffic classification:
	  - IEEE 802.1p CoS
	  - IP TOS / DSCP / IP Precedence
	  - IP TCP/UDP port number
	  - Typical network application
	Traffic-policing policies on the switch port
	DSCP remarking

Time-Sensitive Networking Protocols	**High Precision Time Synchronization**
	  - IEEE1588 (Time Stamping)
	  - 802.1AS-Rev gPTP default profile
	Shapers
	  - 802.1Qbv (Time-aware Scheduling)
	  - 802.1Qch (Cyclic Queuing and Forwarding)
	TSN Stream Policing
	  - 802.1Qci (Per Stream Filtering and Policing)
	Redundancy
	  - 802.1CB (Frame Replication and Elimination for Redundancy for seamless redundancy)
	  - Also standard Linear and Ring protection
	Delay Reduction
	  - IEEE 802.1Qbu Frame Preemption,
	   - IEEE 802.3br Interspersing Express Traffic (IET)

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, TLSv1.2, 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 NMS system PLANET NMSViewerPro/CloudViewerPro
Event Management	Remote syslog Local system log SMTP

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 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000T IEEE 802.3bz 2.5GBASE-X 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 1588 PTPv2 IEEE 802.1ag Connectivity Fault Management (CFM) IEEE 802.1AS - Timing and Synchronization for Time-sensitive Applications IEEE 802.1Qbu Frame Preemption, IEEE 802.3br Interspersing Express Traffic (IET) IEEE 802.1Qci Per-Stream Filtering and Policing (PSFP) IEEE 802.1Qbv Enhancements for Scheduled Traffic IEEE 802.1CB Frame Replication and Elimination for Reliability (FRER) RFC 768 UDP RFC 783 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 ITU-T G.8032 ERPS Ring

Environment

Operating	-40 ~ 75 degrees C
Storage	-40 ~ 85 degrees C
Humidity	5 ~ 95% (non-condensing)

Dimensions

Top View

Side View   **Front View**   **Side View**   **Rear View**

Mounting Kit

TSN-5225-4T2S

Bottom View

Mounting Kit

Unit: mm

Ordering Information

TSN-5225-4T2S	Industrial L2+ 4-Port 10/100/1000T + 2-Port 1G/2.5G SFP Managed TSN Ethernet Switch

Available 1000Mbps Modules

Gigabit Ethernet Transceiver (1000BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MGB-TGT	1000	Copper	--	100m	--	-40 ~ 85ºC
MGB-TSX	1000	LC	Multi Mode	550m	850nm	-40 ~ 85ºC
MGB-TSX2	1000	LC	Multi Mode	2km	1310nm	-40 ~ 85ºC
MGB-TLX(V2)	1000	LC	Single Mode	20km	1310nm	-40 ~ 85ºC
MGB-TL30	1000	LC	Single Mode	30km	1310nm	-40 ~ 85 ºC
MGB-TL40	1000	LC	Single Mode	40km	1310nm	-40 ~ 85 ºC
MGB-TL70	1000	LC	Single Mode	70km	1550nm	-40 ~ 85 ºC
MGB-TL80	1000	LC	Single Mode	80km	1550nm	-40 ~ 85 ºC

Gigabit Ethernet Transceiver (1000BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-TSA	1000	WDM(LC)	Single Mode	2km	1310nm	1550nm	-40 ~ 85ºC
MGB-TSB	1000	WDM(LC)	Single Mode	2km	1550nm	1490nm	-40 ~ 85ºC
MGB-TLA10(V2)	1000	WDM(LC)	Single Mode	10km	1310nm	1550nm	-40 ~ 85ºC
MGB-TLB10(V2)	1000	WDM(LC)	Single Mode	10km	1550nm	1310nm	-40 ~ 85ºC
MGB-TLA20	1000	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 85ºC
MGB-TLB20	1000	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 85ºC
MGB-TLA40	1000	WDM(LC)	Single Mode	40km	1310nm	1550nm	-40 ~ 85ºC
MGB-TLB40	1000	WDM(LC)	Single Mode	40km	1550nm	1310nm	-40 ~ 85ºC
MGB-TLA60	1000	WDM(LC)	Single Mode	60km	1310nm	1550nm	-40 ~ 85ºC
MGB-TLB60	1000	WDM(LC)	Single Mode	60km	1550nm	1310nm	-40 ~ 85ºC
MGB-TLA80	1000	WDM(LC)	Single Mode	80km	1490nm	1550nm	-40 ~ 85ºC
MGB-TLB80	1000	WDM(LC)	Single Mode	80km	1550nm	1490nm	-40 ~ 85ºC
MGB-TLA120	1000	WDM(LC)	Single Mode	120km	1490nm	1550nm	-40 ~ 85ºC
MGB-TLB120	1000	WDM(LC)	Single Mode	120km	1550nm	1490nm	-40 ~ 85ºC

Available 2500Mbps Modules

Gigabit Ethernet Transceiver (2500BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MGB-2GTSR	2500	LC	Multi Mode	300m	850nm	-40 ~ 85ºC
MGB-2GTLR2	2500	LC	Single Mode	2km	1310nm	-40 ~ 85ºC
MGB-2GTLR20	2500	LC	Single Mode	20km	1310nm	-40 ~ 85ºC

Gigabit Ethernet Transceiver (1000BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-2GTLA20	2500	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 85ºC
MGB-2GTLB20	2500	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 85ºC

Related DIN-rail Power Supplies

PWR-40-24	40W 24V DC Single Output Industrial DIN-rail Power Supply (-20 ~ 70 degrees C)
PWR-60-24	60W 24V DC Single Output Industrial DIN-rail Power Supply (-20 ~ 70 degrees C)
PWR-75-24	75W 24V DC Single Output Industrial DIN-rail Power Supply (-20 ~ 70 degrees C)

Related Products

TSN-5225-4T	Industrial L2+ 4-Port 10/100/1000T Managed TSN Ethernet Switch (-40~75 degrees C)
TSN-900-2T2S	Industrial 2-Port 10/100/1000T + 2-Port 1G/2.5G SFP Managed TSN Media Converter (-40~75 degrees C)
TSN-6325-8T4S4X	Industrial L3 8-Port 10/100/1000T + 4-Port 1G/2.5G SFP + 4-Port 10G SFP+ Managed TSN Ethernet Switch
IGS-5225-4T2S	L2+ Industrial 4-Port 10/100/1000T + 2-Port 1000/2500X SFP Managed Ethernet Switch (-40~75 degrees C)

TSN-5225-4T2S