



16-Port Layer 3 Managed Gigabit TSN Switch with 4×10G SFP+ Uplinks

10G
SFP+



Layer 3



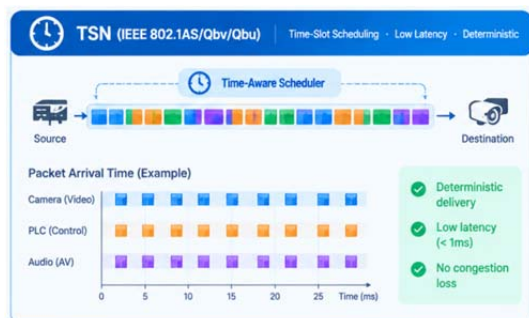
TSNS7500-12GE4TF-L3M

Key Features:

- 12× Gigabit ports with full Layer 3 routing (IPv4/IPv6)
- 4× 10G SFP+ uplinks for high-speed fiber backbone
- TSN (Time-Sensitive Networking) for deterministic, low-latency delivery
- IEEE 1588v2 PTP with sub-microsecond time synchronization
- IEEE 802.1AS/Qbv/Qbu for precise scheduling and time-aware traffic
- Ideal for industrial automation, AV-over-IP, and real-time control
- Advanced QoS with 8 priority queues per port
- ERPS/STP/RSTP/MSTP for ring redundancy under 20ms
- SNMP v1/v2c/v3, CLI, and Web GUI management
- Redundant power inputs for continuous uptime

IEEE 1588v2 PTP with Sub-Microsecond Synchronization

This switch supports IEEE 1588v2 PTP, achieving sub-microsecond time synchronization. Critical for industrial motion control, power automation, and AV-over-IP, it ensures deterministic, ultra-low jitter timing across all nodes. Unlike NTP's millisecond accuracy, PTP hardware timestamping keeps every device precisely aligned, enabling coordinated actions, reliable failover, and accurate data correlation across distributed systems.

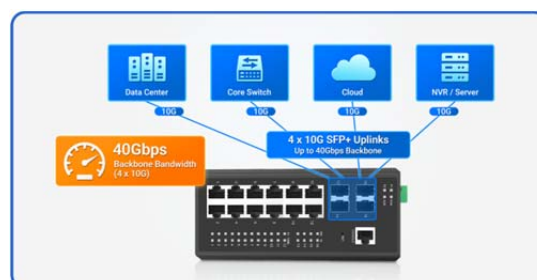


TSN for Deterministic Delivery

Built-in TSN (IEEE 802.1AS/Qbv/Qbu) guarantees deterministic, low-latency transmission for time-critical traffic. By scheduling traffic in precise time slots, it eliminates congestion-induced delays and packet loss. Ideal for industrial automation, real-time control, and AV-over-IP, TSN turns standard Ethernet into a deterministic network—ensuring every frame arrives on time, even under heavy load.

4× 10G SFP+ Uplinks with Full Layer 3 Routing

Four 10G SFP+ uplinks deliver up to 40Gbps backbone bandwidth, eliminating access-to-core bottlenecks. With full Layer 3 routing (IPv4/IPv6, RIP, OSPF, VRRP), inter-VLAN routing is handled directly—no external router needed. Flexible 1G/10G transceiver options suit various distances, reducing hardware costs and simplifying topology while ensuring smooth scalability.



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Technical Datasheet

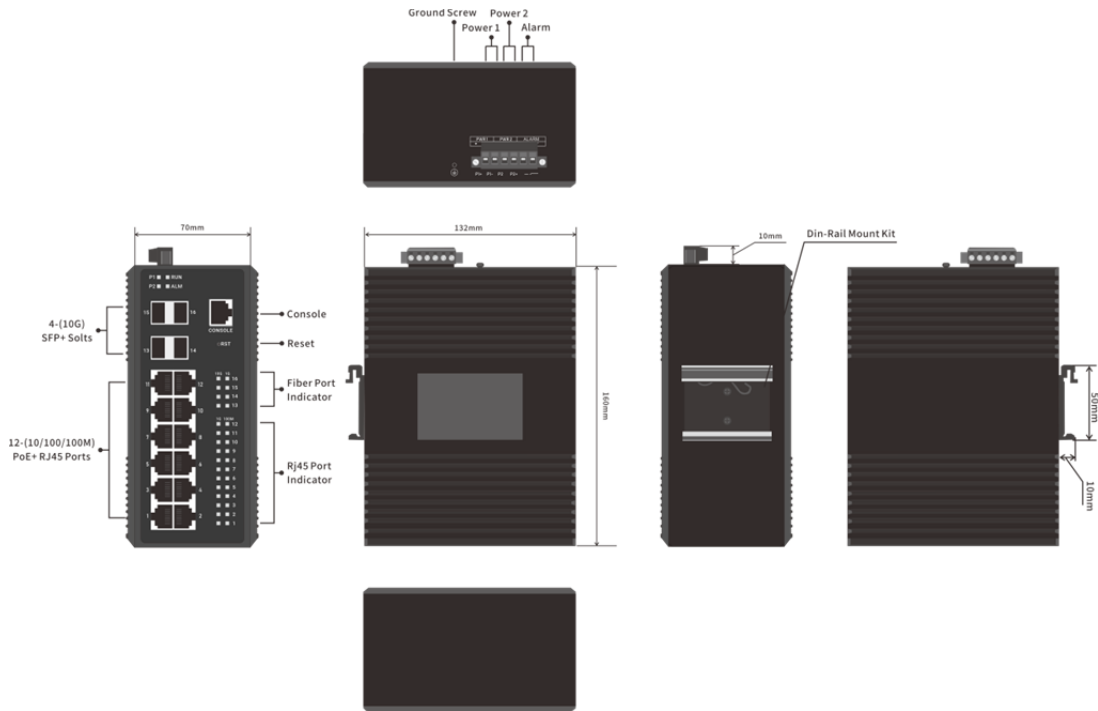
Model	TSNS7500-12GE4TF-L3M
Hardware Specifications	
Connector	16* 10/100/1000BASE-T RJ45 auto MDI/MDIX ports 4* 10G/1GBase-X SFP+ Slots
Console	1xRJ45-to-RS232serialport(115200,8,N,1)
SFP+	Singe fiber/Dual fiber & Singe mode/ Multimode supported. Distance vary the module
Reset Button	< 5 sec: System reboot > 5 sec: Factory default
LED indicators	Power Indicator: PWR(green). System Indicator: RUN(green). Network Indicator: 10G/1G/100M(green)
Power Connector	Removable 6-pin terminal block Pin 1/2 for Power 1; Pin 3/4 for Power 2;
Power Requirements	24~48V DC
Power Consumption/ Dissipation	Max. 12 watts (system on) Max. 20 watts (Full loading)
Alarm Connector	Removable 6-pin terminal block, Pin 5/6 for faultalarm One relay output for power failure. Alarm relay current carry ability:2A@24VDC
ElectrostaticDischarge	Contact Discharge ±8KV, Air Discharge ±15KV
SurgeProtection	Power Supply: ±4kV RJ45 Port: ±2kV
Enclosure	IP40 aluminum case
Thermal Fan	Fanless Design
Installation	Din Rail
Dimension(W×D×H)	160mm x 132mm x 70mm
Weight	1.1Kg
Switching Specifications	
Network standard	IEEE802.3i 10 BASE-T IEEE802.3u 100 BASE-TX IEEE802.3ab 1000BASE-T IEEE802.3z 1000BASE-X IEEE802.3bz 2500BASE-X IEEE802.3ae 10GBASE-X IEEE802.3x Flow Control
Switch Architecture	Store and Forward
Backplane bandwidth	128Gbps
Packet forwarding rate	78Mpps
MAC address	32k
Shared Data Buffer	32Mbits
Jumbo Frame	10 Kbytes
Flow Control	IEEE802.3X full-duplex and Backpressure half-duplex

Layer 2 Functions	
Time-Sensitive Networking Protocols	High Precision Time Synchronization - IEEE1588 (Time Stamping) - 802.1AS-Revg PTP 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) Delay Reduction - IEEE802.1Qbu Frame Preemption
	IEEE1588v2 PTP(Precision Time Protocol) PTP Master PTP Slave Boundary Clock Peer-to-peer transparent clock End-to-end transparent clock Profile:1588/G.8265.1/G.8275.1/802.1AS
	Port Disable/Enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable Port link capability control
	TX/RX/Both Many-to-1monitor Mirror–Remote Switched Port Analyzer (Cisco RSPAN) Supports up to 5sessions
	IEEE802.1Q tagged VLAN IEEE802.1ad Q-in-Q tunneling Private VLAN MAC-based VLAN VLAN Translation VCL Protocol-based VLAN Voice VLAN MVR(Multicast VLAN registration),MVRP(Multiple VLAN Registration Protocol GVRP Up to 4K VLAN groups,out of 4095VLANIDs
Spanning Tree Protocol	IEEE802.1D Spanning Tree Protocol IEEE802.1w Rapid SpanningTreeProtocol IEEE802.1s Multiple Spanning Tree Protocol Supports 7 MSTP instance BPDU Guard, BPDU filtering and BPDU transparent Root Guard
IGMP	IPv4IGMP(v1/v2/v3) snooping IPv4 IGMP querier mode support Supports 255 IGMP groups
MLD Snooping	IPv6 MLD (v1/v2) snooping IPv6 querier mode support

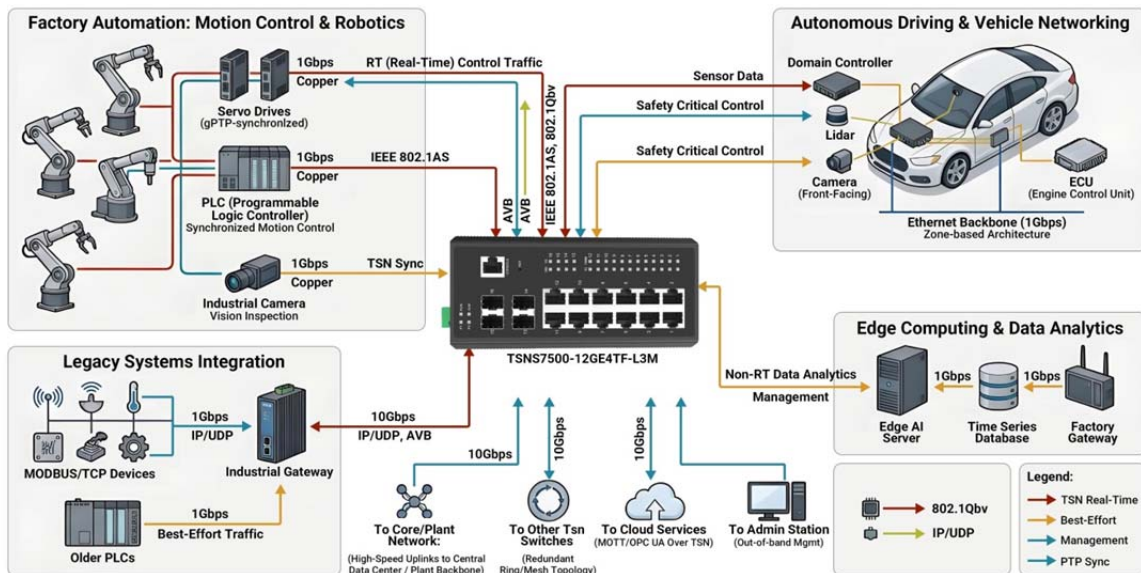
	Support 255 MLD groups
Bandwidth Control	Per port bandwidth control Ingress:10Kbps ~13128Mbps Egress:10Kbps~13128Mbps
Ring, Redundancy, Protection	APSP rotocol (1+1,1:1Mode) MRP(Media Redundancy Protocol) ITU-TG.8032ERPSv2 Recovery time<10ms@3nodes Recovery time<50ms@16nodes Supports major and sub-ring
OAM	IEEE802.3ah OAM, IEEE802.1ag Connectivity Fault Management(CFM)
QoS	Traffic classification based, strict priority and WRR 8-level priority for switching - Portnumber - 802.1ppriority - 802.1QVLANtag - DSCP/ToSfieldinIPpacket
Discoveryand Monitoring	UPnP (Universal Plug and Play) LLDP LLDP-MED UDLD (Unidirectional Link Detection) sFLOW
Security Functions	
Access Control List	IP-based ACL/MAC-based ACL ACL basedon: - MAC Address - IP Address - Ethertype - Protocol Type - VLANID - DSCP - 802.1q Priority Up to 512entries
Network Access Control	IEEE802.1x port-based network access control MAC-based authentication Local/RADIUS authentication
AAA	RADIUSclient TACACS+client
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 64entries
Management Function	
Basic Management Interfaces	Web browser / SNMP v1, v2c Console/CLI; Telnet;

	Firmware upgrade by HTTP protocol through Ethernet network
Secure Management Interfaces	SSHv2, TLSv1.2, SNMP v1, v2c, v3
System Management	Firmware upgrade by HTTP protocol through Ethernet network Configuration upload/download through HTTP Remote Syslog System Log NTP
SNMP MIBs	RFC1213 MIB-II RFC1493 Bridge MIB RFC1643 Ethernet MIB RFC2863 Interface MIB RFC2665 Ether-Like MIB RFC2819 RMON MIB(Group 1,2,3and 9) RFC2737 Entity MIB RFC2618 RADIUS Client MIB RFC2863 IF-MIB RFC2933 IGMP-STD-MIB RFC3411S NMP-Frameworks-MIB RFC4292 IP Forward MIB RFCIP MIB RFC4836 MAU-MIB IEEE802.1X PAE LLDP
Environment	
Safety	FCC Part15 Class A,CE.RoHs, IEC/EN62368-1
EMI	EN55032 ClassA ,CISPR 32 FCC Part 15B ClassA
EMS	Port Surge Protection 6 kV (8/20 μ s) IEC 61000-4-2 (ESD): ± 8 kV Contact Discharge; ± 15 kV Air Discharge IEC 61000-4-3 (RS): 10 V/m (80–1000 MHz) IEC 61000-4-4 (EFT): Power Lines: ± 4 kV; Data Lines: ± 2 kV IEC 61000-4-5 (Surge): Power Lines: CM ± 4 kV / DM ± 2 kV; Data Lines: ± 4 kV IEC 61000-4-6 (Conducted RF): 10 V (150 kHz–80 MHz) IEC 61000-4-8 (Power Frequency Magnetic Field): 100 A/m Continuous; 1000 A/m for 1–3 s IEC 61000-4-9 (Pulsed Magnetic Field): 1000 A/m IEC 61000-4-10 (Damped Oscillatory Magnetic Field): 30 A/m at 1 MHz IEC 61000-4-12/18 (Oscillatory Waves): CM: 2.5 kV; DM: 1 kV IEC 61000-4-16 (Common-Mode Conducted Disturbances): 30 V Continuous; 300 V for 1 s FCC Part 15 / CISPR 22 (EN 55022): Class B IEC 61000-6-2: Generic Industrial Immunity Standard
Stability Testing	IEC 60068-2-32 (free fall) IEC 60068-2-27 (shock) IEC 60068-2-6 (vibration)
Environmental	RoHS
Environment specification	Operating temperature: -40℃~75℃ , operating humidity: 5%~95% Storage temperature: -40℃~85℃ , storage humidity: 5%~95%

Mechanical Drawing



Applications



Ordering Information

TSNS7500-12GE4TF-L3M

16-Ports Layer 3 Managed Gigabit TSN Switch, 12-Ports 10/100/1000Mbps RJ45 and 4 Ports 10G/1G SFP+, Dual power input, 6KV surge protection, DIN-Mount

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