

# Features

- Provide 6/8 x 10/100/1000 Base-T ports, plus 2 x SFP+ slots
- 9K Jumbo Frames
- L2 wire-speed switching engine
- 32K MAC forwarding addresses
- Support TSN standard
  - IEEE 1588 / 802.1AS-Rev qPTP (Generalized Precision Time Protocol),
  - IEEE 802.1Qbv Time Aware Scheduling,
  - IEEE 802.1CB Seamless redundancy
  - IEEE802.1Qbu Pre-emption / Cut-through
- Network redundant LACP; Spanning tree - STP, RSTP & MSTP; quick Ring fail-over protection (< 20 ms); G.8032 ERPS;
- Port-based /tag-based VLAN, IEEE 802.1ad/QinQ VLAN, Add/remove VLAN tags,
- Multicasting support IGMP v1/v2, proxy & snooping
- Multicast/Broadcast/Flooding Storm Control
- IEEE802.1x Access Control
- Per VLAN mirroring



IVS-TN500 TSN Ethernet switch is design for time-sensitive networks to make traditional Ethernet have real-time characteristics. With TSN standard IEEE 802.1AS-Rev qPTP Generalized Precision Time Protocol, IEEE 802.1Qbv Time Aware Scheduling, and IEEE 802.1CB Seamless Redundancy, IVS-TN500 can guaranteed latency times of real-time critical data throughout the network and provide a zero loss network protection for industrial time-sensitive applications.

TSN

Managed

VLAN  
Mirroring

Industrial  
Design

# IVS-TN500 Industrial TSN 10 Gigabit Ethernet Switch

## Technical Specification

### ETHERNET

Operating mode	Store and forward, L2 wire-speed/non-blocking switching engine
MAC addresses	32K
Jumbo frames	9K Bytes

### Copper RJ45 Ports

Speed	10/100/1000 Mbps
MDI/MDIX Auto-crossover	Support straight or cross wired cables
Auto-negotiating	10/100/1000 Mbps speed auto-negotiation; Full and half duplex
Ethernet isolation	1500 VRMS 1 minute

### SFP (pluggable) Ports

Port types supported	SFP (pluggable) Ports 1G/10G BaseSFP+ slot
Fiber port connector	LC typically for fiber (depends on module)
Optimal fiber cable	Typical 50 or 62.5/125 $\mu\text{m}$ for multimode (mm); Typical 8 or 9/125 $\mu\text{m}$ for single mode (sm)
Port types supported	SFP (pluggable) Ports 1G/10G BaseSFP+ slot

### Network Redundancy

Fast Failover Protection Rings	Link loss recovery < 20ms Support Single & Multiple rings; Ring coupling; Dual-homing; Chain
Spanning Tree Protocol	IEEE 802.1D STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Port Trunk with LACP	Static trunk or Dynamic via LACP (Link Aggregation Control Protocol)
ERPS	G.8032 (Ethernet Ring Protection Switching)

### Bridge, Virtual Local Area Networks (VLANs) & Protocols

Flow control	IEEE 802.3x (Full Duplex) and Back-Pressure (Half Duplex)
Max VLANs	1024
VLAN Types	Port-based VLANs; MAC-based VLANs; IP Subnet-based VLANs Protocol-based VLANs. IEEE 802.1Q tag-based VLANs RADIUS-assigned VLAN IEEE 802.1ad Double Tagging (Q in Q)
Multicast protocols	IGMP v1, v2 with up to 255 multicast groups IGMP snooping and querying Immediate leave and leave proxy Throttling and filtering
LLDP	IEEE 802.1ab Link Layer Discovery Protocol (LLDP)

### Traffic management engine & QoS

Priority	IEEE 802.1p QoS
Number of queues per port	8
Scheduling schemes	SPQ, WRR
Traffic Shaper	port-based shaping

### Security

Port security	IP and MAC-based access control IEEE 802.1X authentication Network Access Control
Storm Control	Multicast/Broadcast/Flooding Storm Control

## TSN

	IEEE 802.1AS-Rev qPTP Generalized Precision Time Protocol
	IEEE 802.1Qbv Time Aware Scheduling
	IEEE 802.1CB Seamless redundancy

## Management

User Management interfaces	Cisco-like CLI (command line interface) WEB-based Management SNMP v1, v2c & v3 Telnet (5 sessions)
Management Security	HTTPs, SSH Radius Client for Management
Upgrade & Restore	HTTP/TFTP configuration import/export HTTP/TFTP firmware upgrade
Diagnostic	Syslog Per VLAN mirroring Ethernet Copper connection diagnostic tool SFP with DDM (Digital Diagnostic Monitoring)
MIBs	RFC 1757 RMON 1,2,3,9; RFC 2674 Q-Bridge MIB RFC-1213 MIB-II; RFC-1493 Bridge MIB; RFC 2233 IF MIB
DHCP	Client, Server, Snooping, Relay Agent with Option 82
NTP	Yes
System status	Device info/status; Ethernet port status

## Power

Power input	Redundant Input Terminals
Input voltage range	10-58 VDC
Reverse power protection	Yes
Transient protection	> 15,000 watts peak
Power consumption	22W @24VDC

## Indicators

Power Status indication	Indication of power input status
Ethernet port indication	Link & Speed
System Alarm	Profile-defined System Alarm

## Environmental and Compliances

Operating temperature range	-40 to +65°C (cold startup at -40°C)
Storage temperature range	-40 to +85 °C
Humidity (non-condensing)	5 to 95% RH
Vibration, shock & freefall	IEC60068-2-6, -27, -32
Certification compliance	CE/FCC/UL61010,
Electrical safety	UL61010, CSA C22, CE
EMC	FCC Part 15, CISPR 22 (EN55022) Class A IEC61000-4-2, -3, -4, -5, -6
RoHS and WEEE	RoHS (Pb free) and WEEE compliant
MTBF	> 25 years

## Mechanical

Ingress protection	IP30
Installation option	DIN-Rail mounting, Wall mounting
Dimension	8 Port: 160mm(H) x 127.3mm(D) x 56.5mm(W) 10 Port: 160mm(H) x 127.3mm(D) x 65.5mm(W)
Weight	1252g

## Standards

IEEE 802.3 10BaseT	IEEE 802.1D Spanning Tree Protocol
IEEE 802.3u 100BaseTX	IEEE 802.1w Rapid STP
IEEE 802.3ab 1000BaseT	IEEE 802.1s Multiple STP
IEEE 802.3z 1000BaseX	IEEE 802.1Q VLAN Tagging
IEEE 802.3x Flow Control	IEEE 802.1ad Stacked VLANs
IEEE 802.3az Energy-Efficient Ethernet	IEEE 802.1p Class of Service
IEEE 802.3ad/802.1AX LACP	ITU-T G.8032 ERPS
IEEE 802.1ab LLDP	IEEE 1588v2 PTP
IEEE 802.1X Network Authentication	IEEE 802.1Qbv Time Aware Scheduler
	IEEE 802.1Qbu Frame Preemption
	IEEE 802.1AS-Rev Time and Synchronization
	IEEE 802.1CB FRER (Frame Replication and Elimination for Reliability)
	IEEE 802.1Qci PSFP (Per stream filtering and policing)
	OPC UA (OPC Unified Architecture)

## Ordering Information

Model	Description	Ethernet Port	
		10/100/1000Base T(X)	SFP+
IVS-TN510-2X	Industrial 10-port TSN Ethernet Switch	8	2
IVS-TN508-2X	Industrial 8-port TSN Ethernet Switch	6	2



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