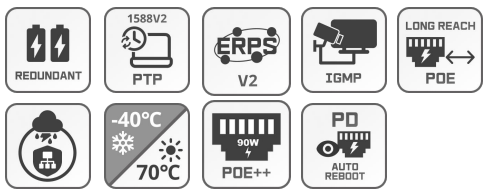
FR-TSN4412F

Industrial L3 Managed 12-port 10/100/1000Base-TX + 12-port 1GBase-SFP + 4-port 1G/10GBase-SFP TSN Fiber Ethernet Switch with Redundant DC Power Inputs, 1U Rack-mount





Software Management

- Interfaces: WebUI, CLI, SNMPv1/v2c/v3
- Discovery & Logs: LLDP, LLDP-MED, NTP, Syslog
- Diagnostics: Port mirroring, sFlow, UDLD, OAM

Main Features

TSN Features

- Time Sync: IEEE 1588v2 PTP and 802.1AS
- Traffic Shaping: IEEE 802.1Qbv and 802.1Qch
- Policing & Preemption: IEEE 802.1Qci and 802.1Qbu
- Redundancy: IEEE 802.1CB seamless redundancy

Layer 2+ Features

- L3 Routing: IPv4/IPv6 OSPFv2/v3, RIPv2, and static routing
- Ring Recovery: ERPSv2 (<20ms), STP/RSTP/MSTP, MRP
- Link Aggregation: Dynamic LACP and static trunking
- VLAN Support: 802.1Q, QinQ, Voice, Private VLAN, MVR
- Multicast: IPv4 IGMP Snooping (v1/v2/v3) and IPv6 MLD Snooping (v1/v2)
- QoS: WRR/SP scheduling and 802.1p/DSCP prioritization

Security

- IEEE 802.1X, AAA, RADIUS, and TACACS+ authentication
- IPv4/IPv6 L2/L3 ACL, IP Source Guard, DAI, Storm control

Industrial Reliability

- Operating temperature -40°C to +75°C
- Redundant DC power inputs / Alarm relay
- High ESD/surge protection / Fanless
- NDAA & RoHS compliant

CE FC

Protected by hardware warranty
Advance replacement. Global coverage.

View policy on Fiberroad's website.

Product Specifications

FR-TSN4412F

Product	FR-TSN4412F
Interface	
RJ45 Ports	12 x 10/100/1000Base-T
SFP Ports	12 x 1G SFP + 4 x 1G/10G SFP+ (compatible with 10G/2.5G/1.25G optical modules); DDM and auto rate detection on fiber ports
Console	1xRJ45-to-RS232 serial port(115200,8,N,1)
Electrical and Mechanical	
Input Voltage	Dual 9-56VDC wide-range inputs
Power Consumption	≤40W (full load)
Surge Protection	±1kV DC, ±1kV RJ45
Enclosure	IP40 aluminum case
Dimension	482.6 x 44 x 300 mm (1U rack-mount), 2.6kg
Standards	
IEEE 802.3	10BaseT
IEEE 802.3u	100BaseT(X) and 100BaseFX
IEEE 802.3ab	1000BaseT(X)
IEEE 802.3z	1000BaseSX/LX/LHX/ZX
IEEE 802.3x	Flow Control
IEEE 802.1D	Spanning Tree Protocol
IEEE 802.1w	Rapid Spanning Tree Protocol
IEEE 802.1s	Multiple Spanning Tree Protocol
IEEE 802.1Q	VLAN tagging
IEEE 802.1p	Class of Service
IEEE 802.1X	Authentication
IEEE 802.1ab	Link Layer Discovery Protocol
IEEE 802.1AS	Time-Sensitive Networking Timing
IEEE 802.1Qbv	Time-Aware Shaper

Product Specifications

FR-TSN4412F

Product	FR-TSN4412F
Switching	
Switch Architecture	Store-and-forward, latency ≤7μs
Switch Fabric	128Gbps backplane bandwidth
Forwarding Rate	95Mpps
Packet Buffer Size	32Mbits
Maximum Packet Length	Up to 10K bytes (jumbo frame)
MAC Address Table	32K
Software Features	
Port Configuration	Device IP configuration; auto-negotiation; auto rate detection on fiber ports
Port Status	Real-time monitoring of port speed, optical power and port details
Port Mirroring	Port mirroring supported
VLAN	4K VLAN entries; port-/MAC-/IP-/protocol-based VLAN; MVRP, GVRP; voice VLAN; VLAN translation
Link Aggregation	Manual link aggregation and LACP
Spanning Tree Protocol	STP (802.1D), RSTP (802.1w), MSTP
Multicast	IGMP Snooping, GMRP
Rate Limitation	14.88Mpps per 10G port line-speed
Ring	ERPSv1/v2 (including on aggregated ports), MRP, RSTP/MSTP
QoS	802.1P/DSCP remarking; SP, WRR, WFQ scheduling; traffic shaping; TSN: IEEE 1588, 802.1AS, 802.1Qbv, 802.1Qbu, 802.1Qci, 802.1CB
ACL	L2/L3/L4 ACL flow identification and filtering
Security	Port security; RADIUS and TACACS+ authentication; AAA framework; over-temperature protection; ARP inspection; DHCP Snooping
Layer 3 Functions	
IP Interfaces	Device IP configuration
IP Services	DHCP server, DHCP snooping, DHCP client
Routing	Static routing; OSPF

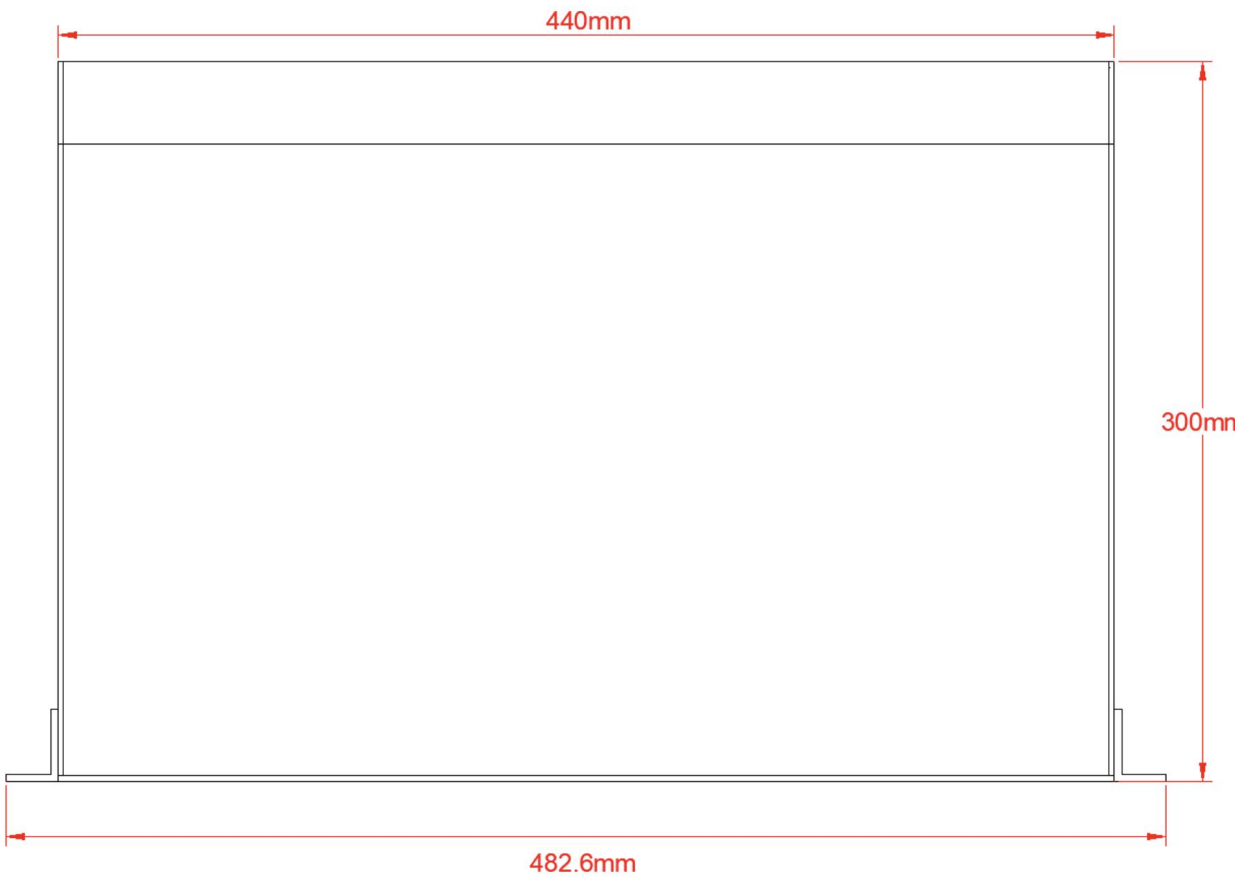
Product Specifications

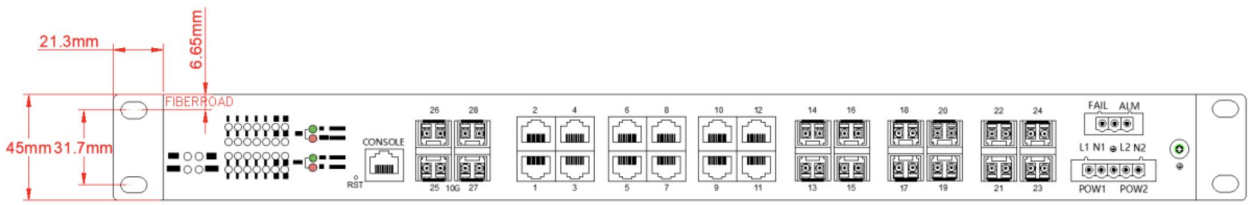
FR-TSN4412F

Product	FR-TSN4412F
Management	
Basic Management Interface	Console, Telnet, SSH, web-based GUI, SNMP v1/v2/v3
Secure Management Interface	SSH, SNMPv3
System Management	Port mirroring, RMON event logging, sFlow traffic statistics, UDLD, DDM, UPnP, OAM; MAC address management (static/dynamic, aging, per-port learning limit)
Environmental	
Operating Temperature	-40°C to 75°C
Storage Temperature	-40°C to 85°C
Operating Humidity	5% to 95% (non-condensing)
MTBF	≥ 300,000 hours
Cooling	Passive cooling, fan-less design
Regulatory	
ISO	Manufactured in ISO-9001 facility
Safety	IEC 62368-1:2020+A11:2020
EMI	FCC Part 15B Class A, IEC 61000-3-2
EMS	IEC61000-4-2 ESD: contact ±8kV, air ±15kV IEC61000-4-5 Surge: power ±6kV; RJ45 ±4kV/±6kV (PoE)
Shock	IEC 60068-2-27
Free Fall	IEC 60068-2-32
Vibration	IEC 60068-2-6
Environmental	RoHS 2011/65/EU Annex II

Product Specifications

Dimension (Unit: mm)





Product Specifications

Ordering Information

Available Model	Description	Input Voltage	Operating Temp.
FR-TSN4412F	Industrial L3 Managed 12-port 10/100/1000Base-TX + 12-port 1GBase-SFP + 4-port 1G/10GBase-SFP TSN Fiber Ethernet Switch with Redundant DC Power Inputs, 1U Rack-mount	Dual 9-56VDC	-40 to +75°C

Optional Accessories (to be purchased separately)	
SFP Optical Transceiver	Please select your SFP on our SFP Modules page for details.

Package Contents	
Device	1 x Industrial Ethernet Switch
Cable	1 x DB9 female to RJ45
Installation Kit	1 x DIN-Rail Clip 2 x Wall-Mount Kits

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