FIBERROAD

INDUSTRIAL L3 MANAGED TSN ETHERNET SWITCH

Product Data Sheet

Introducing the Fiberroad FR-TSN3206, a groundbreaking TSN Industrial Ethernet Switch that is set to revolutionize the world of industrial automation. With its cutting-edge features and advanced capabilities, this switch is truly a game-changer. Boasting an impressive 6x10/100/1000BASE-T RJ45 ports, it provides lightning-fast connectivity for all your network needs. But that's not all – there are also four additional 2x1000BASE-X SFP ports which further enhance its versatility and adaptability. Encased in a rugged IP40 metal case, this beast of a switch guarantees stable operation even in the harshest environments imaginable. It effortlessly addresses every level of the industrial automation network - from the field bus to the factory backbone - ensuring seamless communication throughout your entire system.

Main Features

- 6 x 10/100/1000BASE-T RJ45+ 2 x 1000BASE-X SFP Slots.
- Full gigabit L2+ management, easy to manage the network by CLI/WebGUI/NMS.
- IEEE 1588v2 PTP Precision Time Protocol and SyncE
- Features IEEE 802.1AS Time Synchronization, IEEE802.1Qbu Frame Preemption, IEEE 802.1Qbv Time Aware Shaper and IEEE 802.1CB Seamless Redundancy
- Traffic Classification Based on IEEE 802.1p, CoS, WRR, and Strict Mode
- Supports RSTP/MSTP/ERPSv2/APS/MRP
- RADIUS/TACACS+ users access authentication
- -40 ℃ to +75℃ operating temperature
- DC9-56V input, active to active redundant power failure on one supply
- DIN-rail and wall mountable designs

This powerhouse utilizes Time-sensitive Networking (TSN) technology along with IEEE 1588 Precision Time Protocol (PTPv2) for impeccable time synchronization on all ports - ensuring every operation runs seamlessly in harmony. The FR-TSN3206 effortlessly supports TSN IEEE standards essential for a complete real-time communication solution that exceeds expectations at every turn. From utilizing the incredible IEEE 802.1AS-REV profile for unmatched time synchronization to harnessing the power of IEEE 802.1Qbv Enhancements for Scheduled Traffic and IEEE 802.1Qbu Frame Preemption to optimize data transmission efficiency; this switch has got it all covered! And let's not forget about its prowess in handling critical data thanks to features like the innovative Interspersing Express Traffic (IET) provided by IEEE 802.3br and per-stream filtering and policing abilities offered by IEEE 802.1Qci - enabling seamless reliability even during demanding operations!

Hardware Specifications	
Copper Port	6x10/100/1000Base-T RJ45 auto-MDI/MDI-X
SFP/SFP+ Port	2 x 1000BASE-X SFP slots Compatible with 100BASE-FX,1000BASE-SX/LX/BX SFP optical transceiver
Console	1xRJ45-to-RS232 serial port(115200,8,N,1)
Reset Button	＜5 sec: System Reboot ＞ 5 sec: Factory Default
Connector	6-pin removable terminal block for power input Pin 1-2 for Power 1, Pin 3-4 for Power 2, Pin 5-6 for fault alarm
Alarm	One relay output for power failure. Alarm relay current carry ability:2A @ 24VDC
Enclosure	IP40 aluminum case
Installation	DIN-rail or wall mounting
Dimension(WxDxH)	160mm x 132mm x 70mm
Weight	1100g
Power Input	DC9-56V, 1.5A Max.
Power Consumption	Max. 10 watts
Electrostatic Discharge	Contact discharge：±8kV Discharge in air: ±15kV
Surge Protection	Power Supply: ±6kV RJ45 Port: ±4kV
LED Indicators	P1(Green), P2(Green), ALM(Red). RUN(Green) SFP: 1G(Green) RJ45: 10/100M(Green), 1000M(Green)
Switching Specifications	
Switch Architecture	Store-and-forward
Switch Fabric	64 Gbps/non-blocking
Forwarding Rate	11.9Mpps(64-byte packet size)
Address Table	8K entries, automatic sources address learning and aging
Data Buffer	12Mbits
Jumbo Frame	15K bytes
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
Layer 3 Function	
IP Interfaces	Max. 8 VLAN interface
Routing Table	Max. 32 routing entries
Routing Protocol	Software Based IPv4 Static Routing Software Based IPv6 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 Frame Size (Jumbo frames)
Discovery and Monitoring	Display each port's speed duplex mode, link status, flow control status, auto-negotiation status, trunk status, SFP detection/DDMI UniDirectional Link Detection (UDLD) IEEE 802.1AB-2005 Link Layer Discovery LLDP, TIA 1057 LLDP-MED sFLOW

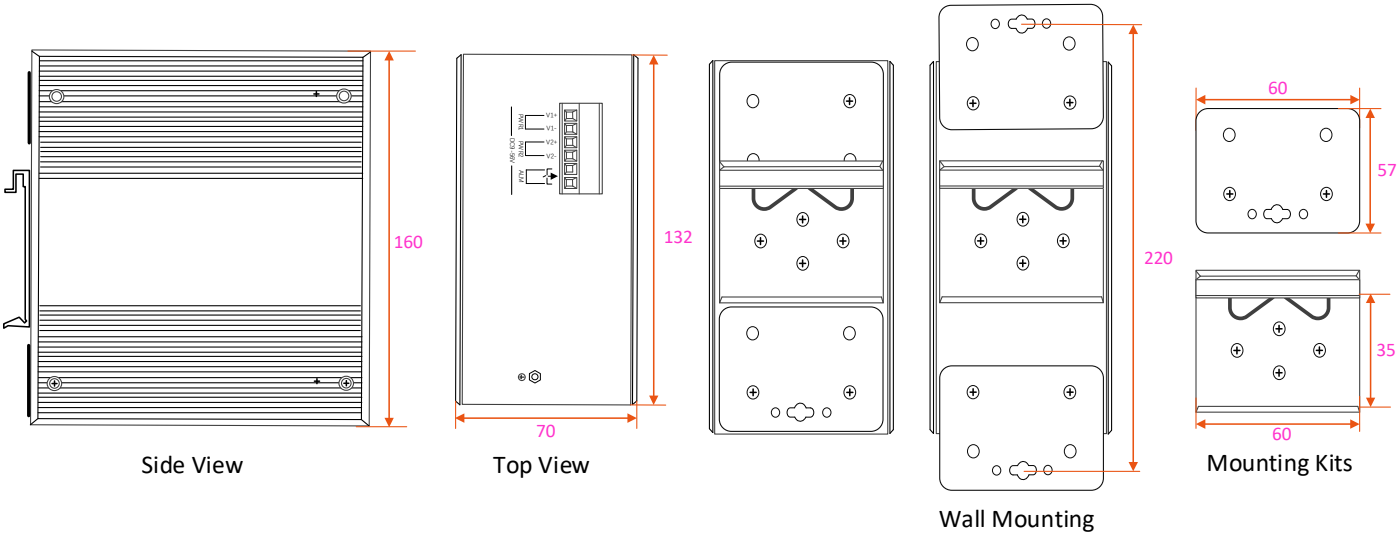
Port Mirroring	TX/RX/Both Many-to-1 monitor RMirror – Remote Port Mirroring Supports up to 5 sessions
VLAN	IEEE 802.1Q tagged VLAN IEEE 802.1ad Q-in-Q tunneling Port Isolation Static Private VLAN Static MAC-based VLAN Protocol-based VLAN Bidirectional VLAN Translate/Unidirectional VLAN translation(ingress/egress) Voice VLAN IP Subnet-based VLAN VLAN/iPVLAN Trunking MVR(Multicast VLAN registration), MVRP(Multiple VLAN Registration Protocol, GVRP IEEE-802.1ad Provider Bridge(Native or Translated) Up to 4K VLAN groups, out of 4095 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk 4 trunk groups with 8 ports per trunk group UNI LAG(LACP) 1:1 Active/Standby LACP Revertive/Non-revertive LACP loop free operation
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 instance) BPDU Guard, BPDU filtering and BPDU transparent Error Disable Recovery
IGMP Snooping	IPv4 IGMP(v1/v2/v3) snooping IPv4 IGMP querier mode support Supports 255 IGMP groups
MLD Snooping	IPv6 MLD(v1) snooping IPv6 querier mode support Support 255 MLD groups
Ring , Redundancy, Protection	**G.8031 APS Protocol (1:1 Mode)** **MRP(Media Redundancy Protocol)/Interconnect** **ITU-T G.8032 ERPSv1/v2** Recovery time＜10ms @ 3 nodes Recovery time＜50ms @ 16 node Supports Major and sub-ring **IEEE-802.1CB (FRER)**
OAM	IEEE 802.3ah OAM IEEE 802.1ag Connectivity Fault Management(CFM)
Synchronization	**IEEE 1588v2 PTP(Precision Time Protocol)** PTP Master PTP Slave Boundary Clock Redundant masters and multiple timing domains Peer-to-peer transparent clock over Ethernet/IPv4 End-to-end transparent clock over Ethernet/IPv4/v6 **IEEE802.1AS-2011/IEEE802.1AS-2020** **NTPv4 Client**
QoS	Ingress Shaper and Egress Rate Limit per port bandwidth control 8 priority queues on all switch ports Priority Queue Scheduling: WRR(Weighted Round Robin), SP(Strict Scheduling Priority) Class of Service: IEEE 802.1p Based CoS, IP TOS, DSCP based CoS QoS Control List (QCL Mode) Global Storm Control for UC, MC and BC Global/VCAP (ACL) policers DiffServ (RFC2474) remarking Management of credit-based shaper IEEE-802.1Qbv (TAS) Time-aware Scheduler IEEE-802.1Qbu & 802.3br Frame Preemption IEEE-802.1Qci ingress gating/policing/checking

Security Functions		
ACL	ACL based on: MAC Address/Ethertype/VLAN ID/DSCP/802.1q Priority Up to 512 entries	
Security	IPv4/v6 source guard Dynamic ARP inspection Command line authority control based on user level Static MAC Address Secure FTP Client	
AAA	RADIUS/TACACS+ client	
Network Access Control	IEEE 802.1x port-based network access control, Single 802.1X, Multiple 802.1X MAC-based authentication, Local/RADIUS authentication Guest VLAN QoS Assignment VLAN Assignment Web Authorization (15 user levels)	
Management		
Management	JSON-RPC/Notifications, Dual CPU(Application variant with JSON) RFC 2131 DHCP Client/Server DHCP Server support for DHCP relay packets, DHCP per port RFC 3315 DHCPv6 Client/Relay Agent RFC 7610 DHCPv6-ShieldPritecting against Rogue DHCPv6 Servers RFC 1035 DNS client, relay IPv4/IPv6 Ping/Traceroute CLI – Console Port/ Telnet Industrial Standard CLI/Configuration/debug commands Port Description CLI Management access filtering HTTPS/SSHv2 IPv6 Management/IPv6 Ready Logo PHASE2(host only) RFC4884(ICMPv6) System Syslog/Software Upload via web SNMPv1 / v2c / v3 Agent RMON (Group 1, 2, 3 & 9), RMON alarm and event(CLI,Web), Alarm Module Industry Standard Discovery Protocol – ISDP Configuration Download/Upload - Industrial Standard Loop detection restore to default Symbolic Register Access Daylight Saving	
Standard MIBs	RFC 2674 VLAN MIB	IEEE 802.1Q Bridge MIB 2008
	RFC 2819 RMON (Group 1, 2. 3 & 9)	RFC 1213 MIB II
	RFC 1215 TRAPS MIB	RFC 4188 Bridge MIB
	RFC 4292 IP Forwarding Table MIB	RFC 4293 Management Information Base for the Internet Protocol (IP)
	RFC 5519 Multicast Group Membership Discovery MIB	RFC 4668 RADIUS auth. Client MIB
	RFC 4670 RADIUS Accounting MIB	RFC 3635 Ethernet-like MIB
	RFC 2863 Interface Group MIB using SMI v2	RFC 3636 802.3 MAU MIB
	RFC 4133 Entity MIB version 3	RFC 4878 Link OAM MIB
	RFC 3411 SNMP Management Frameworks	RFC 3414 User-based Security Model for SNMPv3
	RFC 3415 View-based access Control Model for SNMP	RFC 2613 SMON - PortCopy
	IEEE 802.1 MSTP MIB	IEEE 802.1AB LLDP-MIB (LLDP MIB included in a clause of the STD)
	IEEE 802.3ad (LACP MIB included in a clause of the STD)	IEEE 802.1X (PAE MIB included in a clause of the STD)
	TIA 1057 LLDP-MED (MIB is part of the STD)	Private MIB framework

Regulatory & Warranty	
ISO	Manufactured in ISO-9001facility
Safety	IEC62368-1:2020+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(EU)
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX/100BASE-FX IEEE 802.3z Gigabit 1000T IEEE 802.3z Gigabit SX/LX IEEE 802.3bz 2.5G/5G BASE-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 802.1ag Connectivity Fault Management(CFM) IEEE 802.1AS Timing and Synchronization for Time-sensitive Application IEEE 802.1Qbu Frame Preemption 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 2328 OSPF v2 RFC 5340 OSPF v3 RFC 2453 RIP v2 ITU-T G.8032 ERPS Ring
Warranty	5 Years, Details See: https://fiberroad.com/warranty/
Environment	
Operating Temperature	-40 ℃ to +75℃
Storage Temperature	-40 ℃ to +85℃
Humidity	5 to 95%(non-condensing)

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
Documentation	1 x Quick installation guide 1 x Warranty card 1 x Product notice

Dimensions Unit: mm



Side View | Top View | Wall Mounting | Mounting Kits

Accessories(Sold Separately)

Power Supply	
FR-I-60-24	DIN-rail 24 VDC power supply with 60W/0.6A, 85 to 264 VAC, or 120 to 370 VDC input, -20 to 70°C operating temperature
FR-I-120-48	DIN-rail 48-58V VDC power supply with 120W/1.2A, , 85 to 264 VAC, or 120 to 370 VDC input, -20 to 70°C operating temperature
FR-I-240W-48	DIN-rail 48-55V VDC power supply with 240W/2A, , 85 to 264 VAC, or 120 to 370 VDC input, -20 to 70°C operating temperature
FR-I-480W-48	DIN-rail 48-55V VDC power supply with 480W/4A, , 85 to 264 VAC, or 120 to 370 VDC input, -20 to 70°C operating temperature

SFP Optical Transceiver	
FRSX-1L311C-I	1.25Gb/s 1310nm 10km SFP, wide operation temperature range of -40℃-85℃ (-40℉ - 185℉)
FRSX-1L341C-I	1.25Gb/s 1310nm 40km SFP, wide operation temperature range of -40℃-85℃ (-40℉ - 185℉)
FRSX-1L5X1C-I	1.25Gb/s 1550nm 80/100km SFP, wide operation temperature range of -40℃-85℃ (-40℉ - 185℉)
FRSX-1L3523/5323C-I	1.25Gb/s 1310nm/1550nm 20km BiDi SFP, wide operation temperature range of -40℃-85℃ (-40℉ - 185℉)

Armored Fiber Patch Cable / LAN Cable	
FRPC-A-LC	Armored LSZH LC UPC to LC UPC Duplex OS2 single mode 7.0mm for Ourdoor Application , 1-50m
FRLC-A-CAT6	Armored Cat6 Snagless shielded(SFTP) Ethernet Network Patch Cable, 26AWG, 1000Base-T, 0.5m – 3m

Precautions

To avoid damage to the equipment and personal injury caused by improper use, please observe the following precautions:

- Keep the power off during installation, wear an anti-static wrist, and ensure that the anti-static wrist is in good contact with the skin to avoid potential safety hazards.
- The switch can work normally under the correct power supply. Please confirm that the power supply voltage matches the voltage indicated by the switch.
- Before powering on the switch, please make sure that the power circuit is not overloaded, so as not to affect the normal operation of the switch and even cause unnecessary damage.
- To avoid the risk of electric shock, do not open the case while the switch is working, even if it is not charged, do not open it yourself.
- Before cleaning the switch, pull out the power plug of the switch. Do not wipe with a wet cloth. Do not use liquid to clean it.
- The equipment installed in the rack is generally from bottom to top to avoid overload installation.
- Avoid placing other heavy objects on the surface of the switch to avoid accidents.

Order Information

Model Number	10/100/1000Base-T(X), RJ45	1/2.5/5/10G, SFP/SFP+ Slots	1000BASE-X SFP Slot	Input Voltage	Operating Temp.
FR-TSN3206	6	\	2	DC9-56V	-40 to +75℃

The information in this document is subject to change without notice. Fiberroad Technology Co., Limited has made all effects to ensure the accuracy of the information, but all information in this document does not constitute any kind of warranty. Visit our website for the most up-to-date product information

For more information

For more information about Fiberroad Industrial Ethernet Switch series products,
Visit https://www.fiberroad.com or contact your local account representative.