FIBERROAD®

LAYER 2 PLUS MANAGED INDUSTRIAL ETHERNET SWITCH

Product Data Sheet

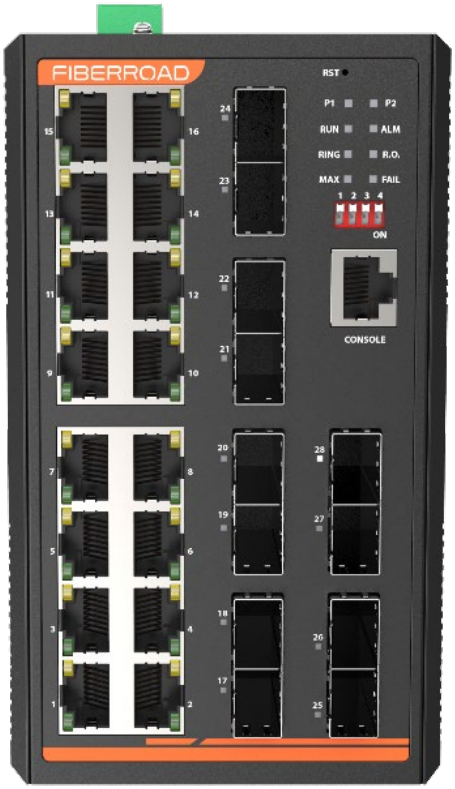
Experience unparalleled performance with the Layer 2+ Plus Managed Industrial Ethernet Switch, designed specifically for demanding industrial environments. Engineered for exceptional stability and reliability, this switch ensures seamless Ethernet transmission in factories, outdoor settings, and harsh conditions. Its robust construction withstands the rigors of industrial applications while delivering advanced management features that facilitate optimal network control. Elevate your operational efficiency and safeguard your critical data communications with a solution that has consistently proven its mettle across various sectors. Invest in enduring quality—choose the Layer 2+ Plus Managed Industrial Ethernet Switch for your networking needs.

Main Features

- 16x10/100/1000BASE-T Gigabit Ethernet RJ45
- 12x100/1000BASE-X SFP Slots
- Optionally support IEEE 802.3 af/at/bt Power Over Ethernet Standard
- Full gigabit L2+ management, easy to manage the network by CLI/WebGUI/NMS.
- Build up a redundant industrial network with STP/RSTP/MSTP/ERPSv2
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- Traffic Classification Based on IEEE 802.1p, COS, WRR, and Strict Mode
- SNMPv1/v2c/v3 for different levels of network management
- Wide operating temperature range -40 to 75℃

(-40 to 167℉)

- All-aluminum Case, Compact and Fanless Design



Engineered for reliability in the most demanding industrial environments, the Layer 2+ Plus Managed Industrial Ethernet Switch seamlessly integrates dual power input design to ensure uninterrupted connectivity. Enclosed in a rugged IP40-rated housing that can be easily mounted on DIN rails or walls, it excels in harsh settings where durability and uptime are critical. With its exceptional operating temperature range of -40 to 75°C, this switch is built to withstand extreme conditions.

Hardware Specifications			
Product	FR-7M348F/A	FR-7M348FP	FR-7M348FBT
Copper Ports	16x10/100/1000BASE-T RJ45 Auto-MDI/MDI-X (Port 1-16)		
Fiber Ports	12x100/1000BASE-X SFP Slots(Port 17-28)		
Console	1x RJ45-to-RS232 Serial Port(115200)		
Connector	1 removable 6-contact terminal blocks 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: 1A@24V DC		
RAM	128Mbyte		
FLASH	32MByte		
Reset Button	＜5 sec: System Reboot; ＞10 sec: Factory Default		
Surge Protection	±6kV DC, ±4kV RJ45	±6kV DC, ±6kV RJ45	
Enclosure	IP40 aluminum case		
Installation	DIN-Rail and Wall-mount		
Dimension	155x128x88mm		
Weight	1500g(Bare weight), 1800g(With package)		
Switching			
Switch Architecture	Store-and-Forward		
Switch Fabric	56Gbps/non-blocking		
Forwarding Rate	41.66Mpps(64-byte packet size)		
Packet Buffer Size	4 Mbits		
Maximum Packet Length	10K bytes		
MAC Address Table	8K entries, automatic source address learning and aging		
Flow Control	IEEE 802.3x pause frame for full duplex, Back pressure for half duplex		
PoE & Power Supply			
PoE Ports	\	Port 1 to 16 IEEE802.3 af/at	Port 1 to 16 IEEE802.3af/at/bt
PoE Power Supply Type	\	End-span	End-span
Power Supply Pin	\	1/2(+), 3/6(-)	1/2(+), 3/6(-) or 4/5(+), 7/8(-)
Max Power Per Port	\	30W	90W
Input Voltage	DC9-56V	DC48-56V	DC52-56V
Power Consumption	15 Watts Max (without PoE load)		
PoE Power Budget	\	240W maximum (Depending on power input)	240W maximum (Depending on power input)
Environmental			
Operating Temperature	-40℃~75℃ (-40 to 167 ℉)		
Storage Temperature	-40℃~85℃ (-40 to 185 ℉)		
Operating Humidity	5%~95% (non-condensing)		
MTBF	907,476 hours @ Telcordia SR-332 Standard		
Heat Dissipation	65 BTU/h (non-PoE mode) 1054 BTU/h (with 240W PoE load)		
Cooling	Passive Cooling, Fanless Design		
Noise Level	0 dBA		

Software Features	
Port Configuration	Port(Admin Status) disable/enable Copper Port: Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Fiber Port: 100M/1000M speed selection Flow Control disable/enable Power saving(EEE) disable/enable Each port description
Port Status	Display each ports' speed duplex mode, link status, flow control status, auto negotiation status, Fiber Port Information, Port Traffic
Port Mirroring	Source Ingress/ Egress Port/ Both, Many-to-1 monitor
VLAN	Up to 4K VLAN groups, out of 4094 VLAN IDs IEEE 802.1Q tag-based VLAN IEEE 802.1AD Q-in-Q tunneling(Double VLAN) GVRP(Generic VLAN Registration Protocol)
Link Aggregation	IEEE 802.3ad LACP/Static trunk Supports 6 trunk groups with 4 ports per trunk
Spanning Tree Protocol	IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol
Multicast	Dynamic/Static Multicast groups IGMP Snooping v1,2,3 Port-based IGMP Snooping Fast Leave GMP Querier
Rate Limitation	Per Port Rate Limitation Ingress: 16-1000000 kbps/Egress: 16-1000000 kbps
Ring	ITU-T G.8032 ERPS, Recovery time < 10ms
QoS	Traffic classification based, strict priority and WRR 8-level priority for switching -Port number -802.1p priority -802.1Q VLAN tag -DSCP/TOS field in IP Packet
ACL	IP-based ACL/MAC-based ACL ACL based on: -MAC Address -IP Address -Ethertype -Protocol Type -VLAN ID -DSCP -802.1p Priority
Security	Port Security Static MAC address IEEE 802.1x port-based network access control RADIUS authentication DHCP Snooping, DHCP option 82
PoE Management Functions	
PoE System Management	PoE Port status monitoring Total PoE power budget control PoE usage threshold and temperature threshold PoE port Priority PoE mode(PoE/PoE+/PoE++) PD reboot(Zero Traffic Duration)
PoE Schedule	Absolute/Periodic Mode

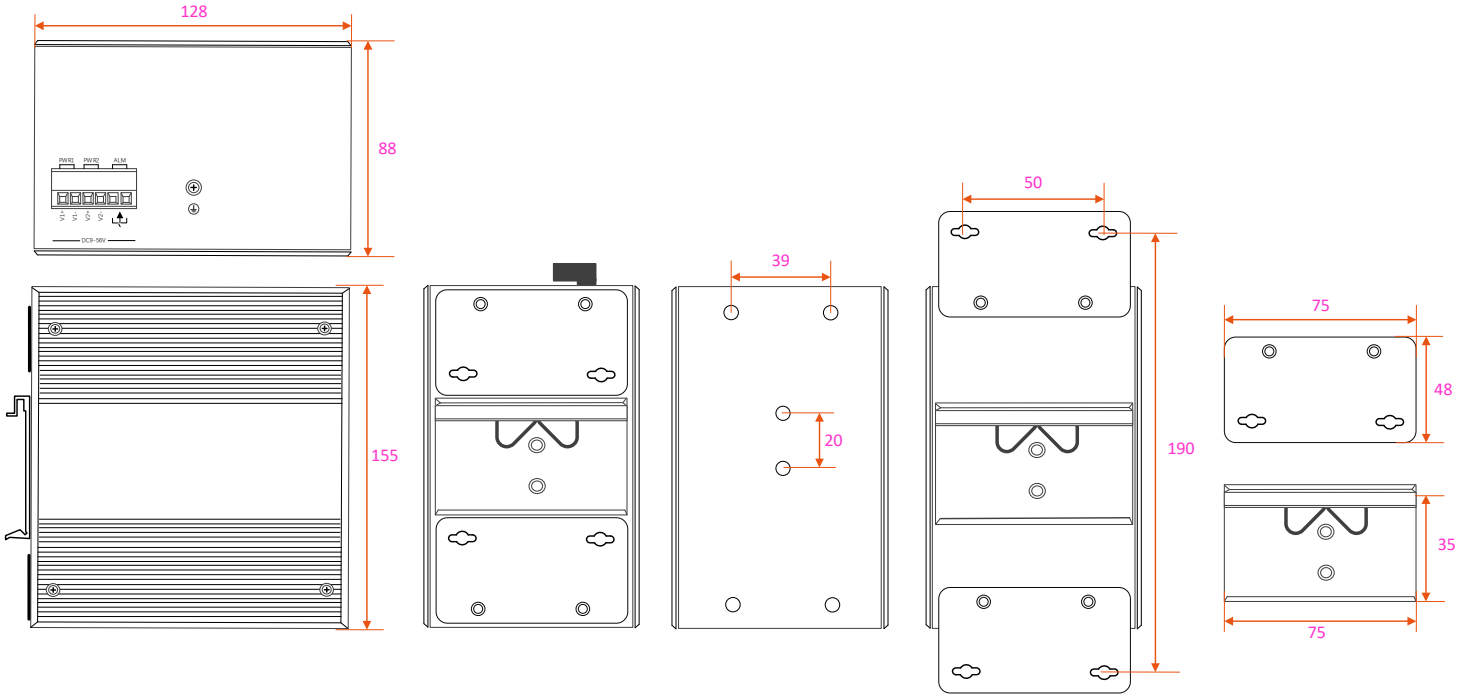
Software Features	
Layer 3 Functions	
IP Interfaces	Max. 8 VLAN interfaces
Routing Table	Max.32 routing entries
Routing	IPv4 software static routing
Management	
Basic Management Interface	Console; Telnet; Web browser; SNMPv1/v2c
Secure Management Interface	SSHv2, TLSv1.2, SNMPv3
System Management	Firmware Upgrade by HTTP protocol through Ethernet network Configuration upload/download through HTTP Remote syslog, System log LLDP protocol, SNTP PREVIEW NMS Alarm(Relay, Led, Temperature, Trap, Power)

LED	State	Description
PWR (P1&P2)	ON	Power is being supplied
	OFF	Power is not being Supplied.
RUN	Blinking	The system is running well
	OFF	The system is running unwell
FAIL(Only For PoE)	ON	PoE Status is abnormal
	OFF	PoE Status is normal
MAX(Only For PoE)	ON	Total PoE Power out of maximum power budget
	OFF	Total PoE Power under maximum power budget
R.O.	ON	Ring Owner
	OFF	Not Ring Owner
RING	ON	Ring is enabled
	OFF	Ring is disabled
Link/ACT (1-28)	ON	Port connection is active
	Blinking	Data transmitted
	OFF	Port connection is not active.
RJ45 Port Speed	ON	1000M is running
	OFF	No 1000M is running
ALM	ON	Has alarm information
	OFF	No alarm information

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)
Warranty	5 Years, Details See: https://fiberroad.com/warranty

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**



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, operation temperature range of -40℃-85℃(-40℉ - 185℉)
FRSX-1L341C-I	1.25Gb/s 1310nm 40km SFP， operation temperature range of -40℃-85℃(-40℉ - 185℉)
FRSX-1L5X1C-I	1.25Gb/s 1550nm 80/100km SFP, operation temperature range of -40℃-85℃(-40℉ - 185℉)
FRSX-1L3523/5323C-I	1.25Gb/s 1310nm/1550nm 20km BiDi SFP, 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 Outdoor Application , 1-50m
FRLC-A-CAT6	Armored Cat6 Snagless shielded(S/FTP) 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 RJ45	100/1000Base-X SFP Port	PoE Standard	Input Voltage	Operating Temp.
FR-7M348F	16	12	\	2xDC9-56V	-40 to +75℃
FR-7M348FA	16	12	\	1xAC220V	-40 to +75℃
FR-7M348FP	16	12	Port 1-24 802.3 af/at	2xDC9-56V	-40 to +75℃
FR-7M348FBT	16	12	Port 1-24 802.3af/at/bt	2xDC9-56V	-40 to +75℃

Shipping

Model No.	FR-7M348F/A	FR-7M348FP/FR-7M348FBT
Classification Codes	HS Code: 851762	
	HTS: 8517.62.00	
NDAA Compliant	Yes	
Individual Gross Weight	1.8kg	2kg
Individual Package Dimension	225x200x110mm	
Package Quantity	14 Units	
Package Gross Weight	26.2kg	29kg
Package Dimension	535x345x470mm	

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. Contact us 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.