



## L3 Managed Ethernet Switches

### FR-9T448F

Industrial L3 Managed 16-port 10/100/1000Base-TX + 8-port  
10/100/1000Base-TX or 100/1000Base-SFP Combo + 4-port  
1000M/10GBase-SFP Ethernet Switch with Redundant AC Power Inputs,  
1U Rack-mount

## Product Data Sheet



# FR-9T448F



## Main Features

- IEEE 802.3af/at/bt PoE++ Standard, without damaging not-PoE devices.
- Advanced PoE management functions : PoE output setting, Smart PoE, PoE scheduling and PoE Budget Management.
- Priority system for PoE Port, it will supply power to the high priority level port first when the power budget is insufficient.
- Layer 3 Model support OSPFv2, RIPv2, Static Route
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS and SSH to enhance network security
- Link Aggregation, STP/RSTP/MSTP/ERPS for network redundancy
- ROMON for proactive and efficient network monitoring
- Fanless, IP40 Rating, -40 ° C ~ 75°C operation temperature design to ensure that the equipment adapts to a variety of harsh environments
- Redundant dual DC/AC power supplies are optional, anti-reverse connection, overcurrent protection

## Overview

L3 Managed Industrial PoE Switch is a multi-port, high-standard Industrial Managed PoE Ethernet Switch independently developed by Fiberroad for industrial ethernet network. This product adopts industry-leading technical standards and can provide stable and reliable Ethernet transmission with high-quality design and reliability. They are designed in a rack mount aluminum housing and have 24 Ethernet ports in total (depending on model). Plus an additional 4\*10Gigabit Ethernet Ports, supports Layer 3 routing functionality to facilitate the deployment of applications across networks. As a result, it can supply power to PD terminal equipment like wireless AP, webcam, VoIP, and IIoT Devices intercom through network cable and meet the infrastructure requirements of a high-density PoE/PoE+/PoE++ supply.

Industrial Ethernet switches adopt mature technologies and open standards. They are equipped with a redundant power supply, high-temperature resistant, anti-electromagnetic interference, low-temperature resistance, anti-vibration, and anti-shake features. They can also operate at -40 to 75°C and have 19" rack mounts that meet IP 40 protection standards. Industrial Ethernet switches are perfect for harsh environments such as military, utility market applications, and industrial networking.

| Ethernet Interface       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model                    | FR-9T448F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Ports                    | 4×10Gigabit SFP plus<br>16×10/100/1000M Base-TX RJ45<br>8×10/100/1000M Base-TX or<br>8×1000M Base-X SFP Combo                                                                                                                                                                                                                                                                                                                                                                                                         |
| Port Mode(Tx)            | Auto-Negotiation<br>Full/Half Duplex Mode<br>Auto MDI/MDI-X Connection                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Standards                | IEEE 802.3 for 10BaseT<br>IEEE 802.3u for 100BaseT(X) and 100BaseFX<br>IEEE 802.3ab for 1000BaseT(X)<br>IEEE 802.3z for 1000BaseSX/LX/LHX/ZX<br>IEEE 802.3ae for 10 Gigabit Ethernet<br>IEEE 802.3x for flow control<br>IEEE 802.1D-2004 for Spanning Tree Protocol<br>IEEE 802.1w for Rapid Spanning Tree Protocol<br>IEEE 802.1s for Multiple Spanning Tree Protocol<br>IEEE 802.1p for Class of Service<br>IEEE 802.1Q for VLAN Tagging<br>IEEE 802.1X for authentication<br>IEEE 802.3ad for Port Trunk with LACP |
| Packet Buffer Size       | 12Mbits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Maximum Packet Length    | Up to 10K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| MAC Address Table        | 16K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Transmission Mode        | Store and Forward (full/half duplex mode)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Exchange Property        | Delay time: < 7μs<br>Backplane bandwidth: 128Gbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| IGMP Group               | 4096                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Max. No. of VLAN         | 256                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| VLAN ID Range            | VID 1 to 4094                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Physical Characteristics |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Housing                  | Aluminum case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| IP Rating                | IP40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Dimensions               | 400mmx300mmx45mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Installation             | Rack Mount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Weight                   | 2800g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Environmental            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Operating Temperature    | -40°C~75°C (-40 to 167 °F)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Operating Humidity       | 5%~90% (non-condensing)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Storage Temperature      | -40°C~85°C (-40 to 185 °F)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| MTBF                     | >250,000@Telcordia(Bellcore)GB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Heat Dissipation         | 75 BTU/h(Non-PoE Load)<br>1672 BTU/h(with MAX PoE Load)                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Cooling                  | Passive Cooling Fanless Design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Noise Level              | 0 dBA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Software Features

|                        |                                                                                                                                                                                                                                                                    |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Management Interface   | CLI(Console/Telnet(RFC854)), WebUI(HTTPS), SNMPv3                                                                                                                                                                                                                  |
| Management             | ARP, Flow Control, DDM, DHCP Server/Client, IPv4/IPv6, LLDP, LLDP-MED, UDLD, Port Mirror, RMON, SNMPv1/v2c/v3, Syslog, Telnet,                                                                                                                                     |
| File Management        | Firmware Upgrade/Backup, Dual Images, Configuration Download/Backup, Multiple Configuration, TFTP(RFC783), HTTP, UART                                                                                                                                              |
| Management Access      | Management VLAN, Management ACL(256)                                                                                                                                                                                                                               |
| Filter                 | 802.1Q, GMRP, GVRP, IGMP Snooping v1/v2/v3, IGMP Querier V2/V3 QinQ VLAN                                                                                                                                                                                           |
| Redundant Network      | Link Aggregation, STP/RSTP/MSTP/ERPSv2, Auto Edge Port, BPDU Filtering Self Loop Detection                                                                                                                                                                         |
| VLAN                   | Support IEEE 802.1Q 4K VLAN, QINQ, Double VLAN, Voice LAN, Surveillance VLAN(Auto/Manual), Multicast VLAN Registration(MVR)                                                                                                                                        |
| Time Management        | Local, SNTP, NTP                                                                                                                                                                                                                                                   |
| Unicast Routing        | OSPFv2, RIPv1/v2, Static Route                                                                                                                                                                                                                                     |
| QOS                    | Support Queue Scheduling(WRR, WFQ, Strict Priority, Hybrid(WRR+SP or WFQ+SP); Priority Queue(8 queues/port); Class of Service(Port-based, 802.1p, IP TOS Precedence, IP DSCP), Trusted QoS, Rate Limitation                                                        |
| ACL Type               | L2/L3/L4, MAC-based, IPv4-based, IPv6-based                                                                                                                                                                                                                        |
| Diagnostic Maintenance | Support port mirroring, Syslog Ping                                                                                                                                                                                                                                |
| POE Management         | PoE working status<br>Scheduling of PoE operation                                                                                                                                                                                                                  |
| Security               | Broadcast Storm Control, HTTPS/SSLv2v3,TLSv1 RADIUS, TACACS+,AAA SSHv1/v2,Support DHCP Snooping, Option 43/82, 802.1X security access, Support user hierarchical management, ACL access control list, Support DOS, port-based MAC filtering/binding, MAC whitelist |
| MIB                    | Ethernet-like MIB, MIB-II, MIB-I, Bridge MIB, Bridge MIB extensions, RMON MIB(1,2,3 & 9 groups, RFC2737 Entity, RFC2863 Interface Group, SNMP-Community-MIB                                                                                                        |

## Power Supply

|                   |                                                          |
|-------------------|----------------------------------------------------------|
| Power Consumption | 24 Watts Max(without PoE load)                           |
| Power Inputs      | 2                                                        |
| Input Voltage     | 110-240 VAC, Redundant dual inputs                       |
| Connector         | AC: 3 Pin AC Socket                                      |
| Protection        | Overload Current Protection, Reverse Polarity Protection |

| LED                | State    | Description                                 |
|--------------------|----------|---------------------------------------------|
| PWR<br>(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<br>(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                        |

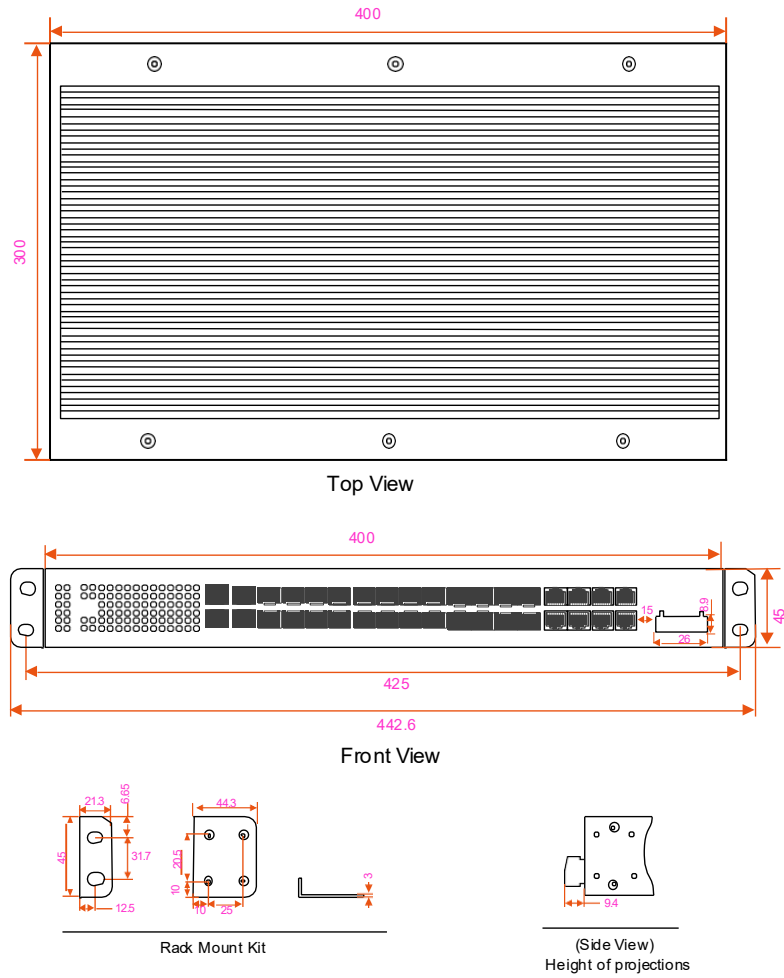
## Certification Standard

|             |                                                                                                                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMC/EMI/EMS | FCC Part15 Class A<br>CE-EMC/LVD<br>RoHS<br>EN61000-4-2 (ESD):LEVEL 4<br>IEC 6100-4-2 (EFT):LEVEL 4<br>IEC 6100-4-2 (Surge): LEVEL 4<br>IEC 6100-4-2 (CS) : LEVEL 3<br>IEC 61000-4-2(PFMP) : LEVEL 5<br>EN61000-4-3 (RS):LEVEL 4 |
| Shock       | IEC60068-2-27                                                                                                                                                                                                                    |
| Vibration   | IEC60068-2-6                                                                                                                                                                                                                     |
| Freefall    | IEC60068-2-31                                                                                                                                                                                                                    |
| Safety      | EN 60950-1, UL 60950-1, CSA C22.2 No.60950-1, UL 508                                                                                                                                                                             |

## Package Contents

|                  |                                                                 |
|------------------|-----------------------------------------------------------------|
| Device           | 1x Industrial Ethernet Switch                                   |
| Cable            | 1xDB9 female to RJ45 10-pin                                     |
| Installation Kit | 2x Rack-Mount Kits                                              |
| Documentation    | 1 x Quick Start guide<br>1 x Warranty card<br>1x Product notice |

Dimensions Unit: mm



Ordering Information

| Available Model | Description                                                                                                                                                                                     | Input Voltage   | Operating Temp. |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|
| FR-9T448F       | Industrial L3 Managed 16-port 10/100/1000Base-TX + 8-port 10/100/1000Base-TX or 100/1000Base-SFP Combo + 4-port 1000M/10GBase-SFP Ethernet Switch with Redundant AC Power Inputs, 1U Rack-mount | Dual AC110-240V | -40 to 75°C     |

Optional Accessories (to be purchased separately)

| Power Supply                          |                                                                                                                       |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| FR-I-40-24                            | DIN-rail 24 VDC power supply with 40W/1.7A, 85 to 264 VAC, or 120 to 370 VDC input, -20 to 70°C operating temperature |
| FR-I-60-24                            | DIN-rail 24 VDC power supply with 60W/2.5A, 85 to 264 VAC, or 120 to 370 VDC input, -20 to 70°C operating temperature |
| SFP Optical Transceiver               |                                                                                                                       |
| (S)=SFP Option                        | Please select your SFP on our SFP Modules page for details.                                                           |
| 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(SFTP) Ethernet Network Patch Cable, 26AWG, 1000Base-T, 0.5m – 3m                       |

## Precautions

To prevent equipment damage or personal injury caused by improper operation, please observe the following precautions:

- ❖ Turn off the power before installation. Wear an anti-static wrist strap and ensure proper skin contact to prevent electrostatic discharge (ESD) damage.
- ❖ Ensure the power supply voltage matches the voltage specified on the switch.
- ❖ Before powering on the switch, verify that the power circuit is not overloaded to avoid abnormal operation or equipment damage.
- ❖ Do not open the chassis while the switch is operating. To avoid the risk of electric shock, do not disassemble the device.
- ❖ Disconnect the power before cleaning. Do not use a wet cloth or liquid cleaners.
- ❖ When installing in a rack, mount equipment from bottom to top to prevent overloading.
- ❖ Do not place heavy objects on the switch.