



# **Ethernet Media Converter**

**Quick Start Guide**

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## Introduction

Thank you for choosing Fiberroad Ethernet Media Converter. This guide is designed to familiarize you with the layout of the Ethernet Media Converter and describes how to deploy them in your network. The Quick Start Guide contains Fiberroad's Unmanaged (PoE) Ethernet Media Converter, Managed (PoE) Ethernet Media Converter.

**In order to understand the network management instructions of Managed Ethernet Media Converter, please visit our website: [www.fiberroad.com](http://www.fiberroad.com).**

## Product Overview

One of the most innovative products in Fiberroad's lineup is their Ethernet Media Converter Series, which includes a range of options to suit different needs. For those who need a simple solution without too many bells and whistles, the Unmanaged Ethernet Media Converter might be best. However, for businesses that require more control over their network infrastructure, the Managed Media Converter allows for greater customization and management capabilities. Another popular option is the PoE Media Converter, which provides power over Ethernet to devices such as IP cameras or wireless access points. Finally, if you work in an industrial setting where harsh conditions are common, consider investing in an Industrial Media Converter that can withstand extreme temperatures and other environmental factors. No matter what your networking needs may be, Fiberroad has a solution designed to help you get connected with ease and efficiency.

## Hardware Overview

### Unmanaged Ethernet Media Converter

Model:FR-2201 & FR-2203



| Ports | FR-2201                | FR-2203                 |
|-------|------------------------|-------------------------|
| RJ45  | 10/100Base-T           | 10/100/1000Base-T       |
| Fiber | 100M SFP or 1x9 Module | 1000M SFP or 1x9 Module |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| FX/LNK | Green    | Link through fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Off      | Fiber port is linked down.                                                     |
| SPD    | On       | Run In Maximum Speed (100M or 1000M, Based on model)                           |
| PWR    | On       | The Device is Powered On                                                       |

| DIP Switch | Name     | Status | Description      |
|------------|----------|--------|------------------|
| #1         | LFP      | OFF    | LFP Disable      |
|            |          | ON     | LFP Enable       |
| #2         | ALS      | OFF    | ALS Disable      |
|            |          | ON     | ALS Enable       |
| #3         | FX Reset | OFF    | FX Reset Disable |
|            |          | ON     | FX Reset Enable  |
| #4         | FX Speed | OFF    | FX 1000M         |
|            |          | ON     | FX 100M(FR-2203) |

**Model:FR-2206**

| Ports | FR-2206             |
|-------|---------------------|
| RJ45  | 2x10/100/1000Base-T |
| Fiber | 1000MM SFP          |

| DIP Switch | Name           | Status | Description     |
|------------|----------------|--------|-----------------|
| #1         | Reserved       | \      | \               |
| #2         | Jumbo Frame    | OFF    | Up to 1500Bytes |
|            |                | ON     | Up to 9KB       |
| #3         | Port Isolation | OFF    | Disable         |
|            |                | ON     | Enable          |
| #4         | FX Speed       | OFF    | FX 1000M        |
|            |                | ON     | FX 100M         |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| FX/LNK | Green    | Link through fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Off      | Fiber port is linked down.                                                     |
| PWR    | On       | The Device is Powered On                                                       |

**Model:FR-2222**

| Ports | FR-2222                  |
|-------|--------------------------|
| RJ45  | 100M/1G/2.5G/5G/10Base-T |
| Fiber | 10G SFP+                 |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| SPD    | Green    | TP 10G                                                                         |
|        | Off      | TP 100M ~ 10G                                                                  |
| FX/LNK | Green    | Link through fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Off      | Fiber port is linked down.                                                     |
| PWR    | On       | The Device is Powered On                                                       |

| DIP Switch | Name                  | Status | Description                 |
|------------|-----------------------|--------|-----------------------------|
| #1         | LFP                   | OFF    | Disable                     |
|            |                       | ON     | Enable                      |
| #2         | ALS                   | OFF    | Disable                     |
|            |                       | ON     | Enable                      |
| #3         | Media Conversion Mode | ON     | 1: TP=10G, FX=10G           |
|            |                       | OFF    | 2: TP=10/100/1000M, FX=1G   |
| #4         |                       | OFF    | TP=10/100/1000M/10G, FX=10G |
|            |                       | ON     |                             |

**Model:FR-2212**

| Ports | FR-2212                  |
|-------|--------------------------|
| RJ45  | 100M/1G/2.5G/5G/10Base-T |
| Fiber | 10G SFP+                 |

| LED    | Status   | Description                                        |
|--------|----------|----------------------------------------------------|
| SFP1/2 | Green/On | The SFP port is actively sending or receiving data |
|        | Off      | The SFP port link is down                          |
| LOOP   | Green/On | Loop enable                                        |
|        | Off      | Loop disable                                       |
| PWR    | Green    | The device is powered on                           |

| DIP Switch | Name                | Status          | Description  |
|------------|---------------------|-----------------|--------------|
| #1         | Combination Setting | #1 OFF / #2 OFF | 125M-11.3G   |
|            |                     | #1 ON / #2 OFF  | 10.35G-11.7G |
| #2         |                     | #1 OFF / #2 ON  | 8.5G         |
|            |                     | \               | \            |
| #3         | Combination Setting | #3 OFF / #4 OFF | Normal       |
|            |                     | #3 ON / #4 OFF  | ALS Enable   |
|            |                     | #3 OFF / #4 ON  | LFP Enable   |
| #4         |                     | #3 ON / #4 ON   | Loop Enable  |

**NOTE:**

1. LFP: Link fault pass through. When enabled, the UTP receiver is passed to the fibre transmitter to make the media converter appear transparent to the connected end devices. It uses link fault pass-through to indicate when far-end fault issues occur. If a fault occurs, the end device indicates a failure for troubleshooting.
2. ALS: Automatic laser shutdown is a procedure to automatically shut down the laser when there is no input light and stop emitting optical signals.
3. FX: Optical Fiber Port
4. FX Reset: When enabled, the PoE will restart if there is no data input to the UTP receiver.
5. Loop: When enabled, run a loop back test to check the interconnection between two media converter devices.

# Hardware Specifications

## Chassis



| Specification                        | Description                   |
|--------------------------------------|-------------------------------|
| Slots                                | 12                            |
| Height                               | 1U                            |
| Output Voltage                       | 12 x 12VDC, 60W Max           |
| Power Interface                      | 12x2.1mm Plugs                |
| Indicating LEDs                      | 2xPower, 2xFan Operational    |
| Input Current                        | 1.8A (115 VAC) / 1A (230 VAC) |
| Power Input                          | 2                             |
| Power Interface                      | 2 x IEC C14 Sockets           |
| Input Voltage                        | 90-264 VAC                    |
| Heat Dissipation at Max Load (BTU/h) | 205                           |
| Operating Temperature                | 0°C to +50°C                  |
| Storage Temperature                  | -20°C to +70°C                |
| IP Rating                            | IP 30                         |
| Product Class                        | Commercial Grade              |

## Standalone



| Specification                        | Description        |
|--------------------------------------|--------------------|
| Power Input                          | 1                  |
| Power Interface                      | 2.1mm Input Socket |
| Input Voltage                        | 5-12 VDC           |
| Heat Dissipation at Max Load (BTU/h) | 10                 |
| Operating Temperature                | 0°C to +50°C       |
| Storage Temperature                  | -20°C to +70°C     |
| IP Rating                            | IP 30              |
| Product Class                        | Commercial Grade   |

## Unmanaged PoE Media Converter

Model:FR-POE231 & FR-POE232



| Ports | FR-POE231              | FR-POE232               |
|-------|------------------------|-------------------------|
| RJ45  | 10/100Base-T           | 10/100/1000Base-T       |
| Fiber | 100M SFP or 1x9 Module | 1000M SFP or 1x9 Module |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| FX/LNK | Green    | Link through Fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Green    | Fiber port is actively sending or receiving data                               |
| P1     | On       | PoE is working                                                                 |
| SPD    | On       | Run In Maximum Speed (100M or 1000M, Based on model)                           |
| DUP    | On       | In Full Duplex Mode                                                            |
| PWR    | On       | The Device is Powered On                                                       |

| DIP Switch | Name     | Status | Description                |
|------------|----------|--------|----------------------------|
| #1         | LFP      | OFF    | LFP Disable                |
|            |          | ON     | LFP Enable                 |
| #2         | ALS      | OFF    | ALS Disable                |
|            |          | ON     | ALS Enable                 |
| #3         | FX Reset | OFF    | FX Reset Disable           |
|            |          | ON     | FX Reset Enable            |
| #4         | FX Speed | OFF    | FX 1000M/100M(Model-based) |
|            |          | ON     | FX 100M/1000M(Model-based) |

## Model:FR-POE233



| Ports | FR-POE233           |
|-------|---------------------|
| RJ45  | 2x10/100/1000Base-T |
| Fiber | 1000M SFP           |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| FX/LNK | Green    | Link through Fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Green    | Fiber port is actively sending or receiving data                               |
| P1/P2  | On       | PoE is working                                                                 |
| SPD    | On       | Run In Maximum Speed (1000M)                                                   |
| PWR    | On       | The Device is Powered On                                                       |

| DIP Switch | Name        | Status | Description       |
|------------|-------------|--------|-------------------|
| #1         | AI PoE      | OFF    | AI PoE Disable    |
|            |             | ON     | AI PoE Enable     |
| #2         | Jumbo Frame | OFF    | Up to 1500Bytes   |
|            |             | ON     | Up to 9KB         |
| #3         | VLAN        | OFF    | Port VLAN Disable |
|            |             | ON     | Port VLAN Enable  |
| #4         | FX100M      | OFF    | FX 1000M          |
|            |             | ON     | FX 100M           |

**Model: FR-POE331 & FR-POE332**

| Ports | FR-POE331              | FR-POE332               |
|-------|------------------------|-------------------------|
| RJ45  | 10/100Base-T           | 10/100/1000Base-T       |
| Fiber | 100M SFP or 1x9 Module | 1000M SFP or 1x9 Module |

| LED        | Status   | Description                                                                    |
|------------|----------|--------------------------------------------------------------------------------|
| TP/LNK     | Green    | Link through copper port is successfully established, but no data transmission |
|            | Blinking | Copper port is actively sending or receiving data.                             |
|            | Off      | Copper port is linked down.                                                    |
| FX/LNK     | Green    | Link through Fiber port is successfully established, but no data transmission  |
|            | Blinking | Fiber port is actively sending or receiving data.                              |
|            | Green    | Fiber port is actively sending or receiving data                               |
| PoE        | On       | PoE is working                                                                 |
| 100M/1000M | On       | Run in maximum speed, 100M or 1000M                                            |
| PWR PoE    | On       | PoE Voltage in normal                                                          |
| PWR        | On       | The Device Is Powered On                                                       |

| DIP Switch | Name         | Status | Description          |
|------------|--------------|--------|----------------------|
| #1         | ENROM        | OFF    | FX Reset Disable     |
|            |              | ON     | FX Reset Enable      |
| #2         | FX100M       | OFF    | FX 1000M             |
|            |              | ON     | FX 100M              |
| #3         | PoE Shutdown | OFF    | PoE Shutdown Disable |
|            |              | ON     | PoE Shutdown Enable  |
| #4         | LFP          | OFF    | LFP Disable          |
|            |              | ON     | LFP Enable           |
| #5         | Mode1        | OFF    | ALS Disable          |
|            |              | ON     | ALS Enable           |
| #6         | Mode2        | OFF    | AI PoE Disable       |
|            |              | ON     | AI PoE Enable        |

**NOTE:**

1. ENROM: When enabled, when the optical link is down, the media converter will reboot.
2. LFP: Link fault pass through, When enabled, the UTP receiver is passed to the fiber transmitter to make the media converter appear transparent to the connected end devices. It uses link fault pass-through to indicate when far-end fault issues occur. If a fault occurs, the end device indicates a failure for troubleshooting.
3. Ai PoE: When enabled, the PoE will restart if there is no data input to the UTP receiver.

## Hardware Specifications

### Model: FR-POE231, FR-POE232, FR-POE233

| Specification                        | Description        |
|--------------------------------------|--------------------|
| Power Input                          | 1                  |
| Power Interface                      | 2.1mm Input Socket |
| Input Voltage                        | 48-56 VDC          |
| PoE                                  | 30W PoE Per Port   |
| PSE Mode                             | Mode A             |
| Heat Dissipation at Max Load (BTU/h) | 113                |
| Operating Temperature                | 0°C to +50°C       |
| Storage Temperature                  | -20°C to +70°C     |
| IP Rating                            | IP 30              |
| Product Class                        | Commercial Grade   |

### Model: FR-POE331, FR-POE332

| Specification                        | Description      |
|--------------------------------------|------------------|
| Power Input                          | 1                |
| Power Interface                      | IEC C14 Sockets  |
| Input Voltage                        | 100-240 VAC      |
| PoE                                  | 30W PoE Per Port |
| PSE Mode                             | Mode A           |
| Heat Dissipation at Max Load (BTU/h) | 113              |
| Operating Temperature                | 0°C to +50°C     |
| Storage Temperature                  | -20°C to +70°C   |
| IP Rating                            | IP 30            |
| Product Class                        | Commercial Grade |

## PoE & Power Supply (Based on Model)

### Standard Model

|                          |                                 |
|--------------------------|---------------------------------|
| PoE Standard             | IEEE802.3af/at (Based on model) |
| Power Supply Pin         | Default: 1/2(+), 3/6(-)         |
| Max PWR Per Port         | 30W                             |
| Total PWR/ Input Voltage | DC48-56V                        |

### IEEE802.3bt Model

|                  |                                         |
|------------------|-----------------------------------------|
| PoE Standard     | IEEE802.3bt (Based on model)            |
| Power Supply Pin | Default: 1/2(+), 3/6(-), 4/5(+), 7/8(-) |
| Max PWR Per Port | 90W                                     |
| Input Voltage    | DC52-56V                                |

### PoE Power Specification

| Spec             | 802.3af PoE  | 802.3at PoE+  |
|------------------|--------------|---------------|
| Device Power     | 12.95W       | 25.5W         |
| Supplied Power   | 15.4W        | 30W           |
| Device Voltage   | 44-57V       | 50-57V        |
| Supplied Voltage | 37-57V       | 42.5-57V      |
| Current (MAX)    | 350mA        | 600mA         |
| Resistance(Ω)    | 20           | 12.5          |
| Cable Type       | Cat3, Cat5   | Cat5          |
| Spec             | 802.3bt 4PoE | 802.3bt Type4 |
| Device Power     | 51W          | 71W           |
| Supplied Power   | 60W          | 100W          |
| Device Voltage   | 50-57V       | 52-57V        |
| Supplied Voltage | 42.5-57V     | 41.1-57V      |
| Current (MAX)    | 600mA        | 960mA         |
| Resistance(Ω)    | 12.5         | 12.5          |
| Cable Type       | Cat5         | Cat5          |

## Hardware Overview

### Managed Media Converter

#### Model:FR-6101/R



| Ports | FR-6101/R              |
|-------|------------------------|
| RJ45  | 10/100Base-T           |
| Fiber | 100M SFP or 1x9 Module |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| FX/LNK | Green    | Link through Fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Green    | Fiber port is actively sending or receiving data                               |
| 100M   | On       | Run In Maximum Speed (100M)                                                    |
| DUP    | On       | In Full Duplex Mode                                                            |
| PWR    | On       | The Device is Powered On                                                       |

#### Model:FR-6102/R



| Ports | FR-6102/R              |
|-------|------------------------|
| RJ45  | 2x10/100Base-T         |
| Fiber | 100M SFP or 1x9 Module |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| FX/LNK | Green    | Link through Fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Green    | Fiber port is actively sending or receiving data                               |
| 100M   | On       | Run In Maximum Speed (100M)                                                    |
| PWR    | On       | The Device is Powered On                                                       |

**Model: FR-6103/R**

| Ports | FR-6103/R               |
|-------|-------------------------|
| RJ45  | 10/100/1000Base-T       |
| Fiber | 1000M SFP or 1x9 Module |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Yellow   | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| FX/LNK | Green    | Link through Fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Green    | Fiber port is actively sending or receiving data                               |
| 1000M  | On       | RJ45 In Maximum 1000M Speed                                                    |
| 100M   | On       | RJ45 In Maximum 100M Speed                                                     |
| DUP    | On       | In full duplex mode                                                            |
| LFP    | On       | LFP function in active                                                         |
| PWR    | On       | The Device is Powered On                                                       |

**Model: FR-6104/R**

| Ports | FR-6104/R           |
|-------|---------------------|
| RJ45  | 2x10/100/1000Base-T |
| Fiber | 1000M SFP           |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| TP/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| FX/LNK | Green    | Link through Fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Green    | Fiber port is actively sending or receiving data                               |
| 1000M  | On       | Run In Maximum Speed (1000M)                                                   |
| PWR    | On       | The Device is Powered On                                                       |

**Model: FR-6601/R**

| Ports | FR-6601/R  |
|-------|------------|
| RJ45  | 10G Base-T |
| Fiber | 10G SFP+   |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| P1/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| P2/LNK | Green    | Link through Fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Green    | Fiber port is actively sending or receiving data                               |
| P1 10G | On       | RJ45 In Maximum Speed (10G)                                                    |
| P2 In  | On       | Optical Transceiver Inserted                                                   |
| Loop   | On       | Loopback mode in active                                                        |
| PWR    | On       | The Device is Powered On                                                       |

**Model: FR-6201/R**

| Ports | FR-6201/R        |
|-------|------------------|
| Fiber | 125M to 2.5G SFP |

| LED    | Status   | Description                                                                   |
|--------|----------|-------------------------------------------------------------------------------|
| P1/LNK | Green    | Link through Fiber port is successfully established, but no data transmission |
|        | Blinking | Fiber port is actively sending or receiving data.                             |
|        | Off      | Fiber port is linked down.                                                    |
| P2/LNK | Green    | Link through Fiber port is successfully established, but no data transmission |
|        | Blinking | Fiber port is actively sending or receiving data.                             |
|        | Green    | Fiber port is actively sending or receiving data                              |
| PWR    | On       | The Device is Powered On                                                      |

**Model: FR-6603/R**

| Ports | FR-6603/R       |
|-------|-----------------|
| Fiber | 125M to 10G SFP |

| LED    | Status   | Description                                                                   |
|--------|----------|-------------------------------------------------------------------------------|
| P1/LNK | Green    | Link through Fiber port is successfully established, but no data transmission |
|        | Blinking | Fiber port is actively sending or receiving data.                             |
|        | Off      | Fiber port is linked down.                                                    |
| P2/LNK | Green    | Link through Fiber port is successfully established, but no data transmission |
|        | Blinking | Fiber port is actively sending or receiving data.                             |
|        | Green    | Fiber port is actively sending or receiving data                              |
| P1 IN  | On       | Optical Transceiver Inserted                                                  |
| P2 IN  | On       | Optical Transceiver Inserted                                                  |
| Loop   | On       | Loopback mode in active                                                       |
| PWR    | On       | The Device Is Powered On                                                      |

**Model: FR-6604/R**

| Ports | FR-6604/R          |
|-------|--------------------|
| Fiber | 8.5G to 11.7G SFP+ |

| LED    | Status   | Description                                                                    |
|--------|----------|--------------------------------------------------------------------------------|
| P1/LNK | Green    | Link through copper port is successfully established, but no data transmission |
|        | Blinking | Copper port is actively sending or receiving data.                             |
|        | Off      | Copper port is linked down.                                                    |
| P2/LNK | Green    | Link through Fiber port is successfully established, but no data transmission  |
|        | Blinking | Fiber port is actively sending or receiving data.                              |
|        | Green    | Fiber port is actively sending or receiving data                               |
| Loop   | On       | Loopback mode in active                                                        |
| PWR    | On       | The Device Is Powered On                                                       |

## Hardware Specifications

### Chassis



| Specification         | Description                             |
|-----------------------|-----------------------------------------|
| Slots                 | 17                                      |
| Height                | 2U                                      |
| Output Voltage        | DC 5V Per Slot                          |
| Power Interface       | 12x2.1mm Plugs                          |
| Power Input           | 2                                       |
| Power Interface       | 2 x IEC C14 Sockets                     |
| Fan Unite             | 3                                       |
| Input Power           | AC 100-240V or DC-48V 1.5-3.0A, 50/60Hz |
| Operating Temperature | 0°C to +50°C                            |
| Storage Temperature   | -20°C to +70°C                          |
| IP Rating             | IP 30                                   |
| Product Class         | Commercial Grade                        |

### Standalone

**Type 1: Without Fan Unit, Support Media Converter card with rates below 10Gbits/s**



| Specification         | Description                             |
|-----------------------|-----------------------------------------|
| Power Input           | 1                                       |
| Power Interface       | IEC C14 Sockets                         |
| Input Power           | AC 100-240V or DC-48V 1.5-3.0A, 50/60Hz |
| Power Switch          | 1                                       |
| Operating Temperature | 0°C to +50°C                            |
| Storage Temperature   | -20°C to +70°C                          |
| IP Rating             | IP 30                                   |
| Product Class         | Commercial Grade                        |

**Type 2: With Fan Unit, Support Media Converter card with rate up to 10Gbit/s or above.**



| Specification         | Description                             |
|-----------------------|-----------------------------------------|
| Power Input           | 1                                       |
| Power Interface       | IEC C14 Sockets                         |
| Input Power           | AC 100-240V or DC-48V 1.5-3.0A, 50/60Hz |
| Power Switch          | 1                                       |
| Fan Unit              | 1                                       |
| Operating Temperature | 0°C to +50°C                            |
| Storage Temperature   | -20°C to +70°C                          |
| IP Rating             | IP 30                                   |
| Product Class         | Commercial Grade                        |

## Installation Guidelines

**Before determining where to place the Ethernet Media Converter, Please read these guidelines.**

### Environment Guideline

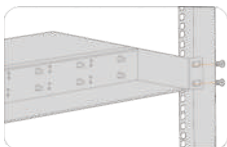
- Do Not operate it in an area that exceeds an ambient temperature of 50°C
- The installation site should be well ventilated.
- Be sure that the Ethernet Media Converter is level and stable to avoid any hazardous condition.
- Do not install the equipment in a dusty environment.
- The installation site must be free from leaking or dripping water, heavy dew and humidity.

### **Rackmount Installation (Instruction for FR-2000 series)**

1. Install the hanging ears on the left rear side of the media converters with two screws.



2. Place the chassis into the rack. Align the brackets to the side holes on the rack and use the rack screws to secure the chassis to the rack.



3. Install the media converter in the chassis in sequence (First install the lower level, then the upper level). Each media converter can be fixed tightly in the chassis by two screws.



### **Desk Mounting (Each of the Standalone Type Media Converter Supported)**

Place the media converters on the flat, secure surface (such as a desk), leaving ample space around them for ventilation.

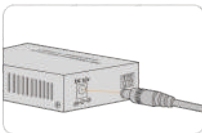


### **Wall Mounting (Individual Model Support)**

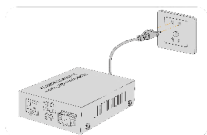
1. Install mounting bracket on the bottom of the media converter
2. Place at desired location and secure with dedicated screws.



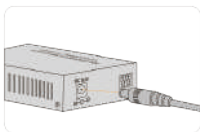
### **Connecting to the power (Based on Model)**



1. Desktop Mounting: Connect the power adapters to the media converter and verify that the Power LED lights up.



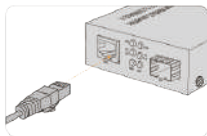
2.Rack Mounting: Connect the power cord to the media converter chassis and turn on the power switches on the back of the media converter chassis. Then verify that the power LED Lights up.



## Port and Slot Connection

### Connecting to the RJ45

Connect an Ethernet cable to the RJ45 port of the media converter



### Connecting to the Fiber Optical Port

1.Insert an SFP module into the SFP slot

2.Connect a fiber optic cable to the SFP module. Plug the other end of the fiber optic cable to the fiber network

## Wiring Requirements

Cable laying need to meet the following requirements,

- 1.It is needed to check whether the type, quantity and specification of cable match the requirement before cable laying;
- 2.It is needed to check the cable is damaged or not, factory records and quality assurance booklet before cable laying;
- 3.The required cable specification, quantity, direction and laying position need to match construction requirements, and cable length depends on actual position;
- 4.All the cable cannot have break-down and terminal in the middle;
- 5.Cables should be straight in the hallways and turning;
- 6.Cable should be straight in the groove, and cannot beyond the groove in case of holding back the inlet and outlet holes. Cables should be banded and fixed when they are out of the groove;
- 7.User cable should be separated from the power lines. Cables, power lines and grounding lines cannot be overlapped and mixed when they are in the same groove road. When cable is too long, it cannot hold down other cable, but structure in the middle of alignment rack;
- 8.Pigtail cannot be tied and swerved as less as possible. Swerving radius cannot be too small (small swerving causes terrible loss of link). Its banding should be moderate, not too tight, and should be separated from other cables;
- 9.It should have corresponded simple signal at both sides of the cable for maintaining.

## Troubleshooting and Maintenance

### Managed Media Converter

If the Manager page does not appear:

- Ping the device's IP address from the PC where the browser is launched. If not, check Computer's network connectivity.
- Confirm that the port LED for the NMC port connected to your network is green.
- Confirm that the computer that you are using to access the managed media converter has network connectivity by clicking it to

a well-known web server in your network. If there is no network connection, troubleshoot the network settings on the computer.

- Make sure that the IP address in the browser is correct.
- If the IP address in the browser is valid, the network managed card LED is green, and the computer has network connectivity, continue troubleshooting by reconnecting the laptop to the switch. Configure a static IP address on the computer in the same subnet as the switch IP address.
- When the LED on the NMC port connected to the computer is green, reenter the IP address in a web browser to display the Device Manager. When Device Manager appears, you can continue with the switch configuration.

### Diagnosing Problem

The ethernet media converter LEDs provide troubleshooting information. They show fast boot failures, port-connectivity problems, and overall performance.

### Media Converter LEDs

Look at the port LEDs information when troubleshooting the ethernet media converter. See each model of media converter LEDs, for a description of the LED colors and their meanings.

### Connections

#### Bad or Damaged Cable

Please always examine the cable for marginal damage or failure. A cable might be just good enough to connect at the physical layer, but it could corrupt packets due to slight damage to the wiring or connectors. You can identify this problem because the port has many packet errors or constantly flaps (loses and regains link).

- Exchange the copper or fiber-optic cable with a known suitable cable.
- Look for broken or missing pins on cable connectors.
- Rule out any bad patch panel connections or media convertors between the source and the destination. If possible, bypass the

- patch panel, or eliminate media convertors (fiber-optic-to-copper).
- Try the cable in another port to see if the problem follows the line.

## Ethernet and Fiber-Optic Cables

Make sure that you have the correct cable:

- For Ethernet, use Category 3 copper cable for 10 Mb/s UTP connections. Use either Category 5, Category 5e, or Category 6 UTP for 10/100 Mb/s, and PoE connections.
- Verify that you have the correct fiber-optic cable for the distance and port type. Make sure that the connected device ports match and use the same type of encoding, optical frequency, and fiber type.
- Determine if a copper crossover cable was used when a straight-through was required or the reverse.

## Link Status

Verify that both sides have a link. A broken wire or a shutdown port can cause one side to show a link even though the other side does not have a connection.

- A port LED is on does not guarantee that the cable is functional. It might have encountered physical stress, causing it to function at a marginal level. If the port LED does not turn on:
- Connect the cable from the media converter to a known suitable device.
- Ensure that both ends of the line are connected to the correct ports. Verify that both devices have power.
- Verify that you are using the correct cable type.
- Look for loose connections. Sometimes a cable appears to be seated but is not. Disconnect the line, and then reconnect it.

## LAN Port Connections

If a port appears to malfunction:

- Verify the status of all ports by checking the LEDs.
- Verify the cable type.

## SFP Module

Use only Fiberroad SFP modules. Each Fiberroad module has an internal serial EEPROM encoded with security information.

This encoding verifies that the module meets the requirements for the media converter.

- Inspect the SFP module. Exchange the suspect module with a known suitable module.
- Verify that the module is supported on this platform. (The media converter release notes on Fiberroad list the SFP modules that the media converter supports.)
- Make sure that all fiber-optic connections are clean and securely connected.

## Interface Settings

Verify that the interface is not disabled or powered off. If an interface is manually shut down on either side of the link, it does not come up until you reenables the interface. If needed, reenables the interface.

## Ping End Device

Ping from a laptop first, and then work your way backport by port, interface by interface, and trunk by trunk until you find the source of the connectivity issue. Make sure that each switch can identify the end device MAC address in its Content Addressable Memory (CAM) table.

## Performance

A common issue occurs when duplex and speed settings are mismatched between two switches, between a button and a router, or between a workstation or server. Mismatches can happen when manually setting the speed and duplex or from auto-negotiation issues between the two devices.

To maximize switch performance and ensure a link, follow one of these guidelines when changing the duplex or the speed settings.

- Let both ports auto-negotiate both speed and duplex.
- Manually set the speed and duplex parameters for the interfaces on both ends of the connection.
- If a remote device does not auto-negotiate, use the same duplex settings on the two ports. The speed parameter adjusts itself even if the connected port does not auto-negotiate.

## Cable and Connectors

### Connector Specifications

#### 100M/1G/2.5G/5G/10G LAN Ports Pinouts

The Ethernet Copper LAN Port on the switches use RJ45 connectors



Figure: Ethernet Copper LAN Port Pinouts

**NOTE:** For the models of the media converter that support PoE, connector pins 4 and 5 supply +48VDC and pins 7 and 8 are the DC voltage return lines.

**CAUTION:** PoE faults are caused when non-compliant cabling or powered devices connect pre-standard IP phones, IP cameras, or wireless access points or IEEE 802.3af/at/by compliant devices to PoE ports. A cable or device that causes a PoE fault must be removed from the network.

**NOTE:** You can use the MDIX auto interface configuration command via CLI or Web GUI to enable the automatic medium-dependent interface crossover (Auto-MDIX) feature. When the Auto-MDIX feature is enabled, the switch detects the required cable type for copper Ethernet and configures the interfaces accordingly. Therefore, you can use either a crossover or straight-through actions to a copper SFP module port on the switch, regardless of the type of device on the other end of the connection.

## Fiber-Optic Module Connectors

Figure 17 Fiber-Optic Module Connectors show LC, SC, FC, ST type connectors used with Fiber-Optic Module. It's a fiber-optic cable connector.



**Warning:** Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

## Fiber-Optic Module Cables

Each port must match the wave-length specifications on each end of the cable, and for reliable communications, the cable must not exceed the allowable length.

### NOTE:

- The maximum operating temperature of the switch varies depending on the type of SFP module you use.
- Modal bandwidth applies only to multimode fiber.
- A mode-field diameter/cladding diameter = 9 micrometers/125 micrometers.
- A mode-conditioning patch cord is required when using 1000BASE-LX/LH SFP modules, MMF, and a short link distance. An ordinary patch cord can cause transceiver saturation, resulting in an elevated bit error rate (BER). When using the LX/LH SFP module with a 62.5-micron diameter MMF, you must install a mode-conditioning patch cord between the SFP module and the MMF cable on both the sending and receiving ends of the link. The mode-conditioning patch cord is required for connection distances greater than 984 feet (300 m).

- 1000BASE-ZX SFP modules can send data up to 62 miles (100 km) using dispersion-shifted SMF or low-attenuation SMF. The distance depends on the fiber quality, the number of splices, and the connectors.
- When the fiber-optic cable span is less than 15.43 miles (25 km), insert a 5-decibel (dB) or 10-dB inline optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASE-ZX SFP module.

## Compliance Information

### FCC

NOTE: This equipment has been tested and found to comply with the limits for a class digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

The device complies with part 15 of the FCC Rules. Operation is subject to the This device may not cause harmful interference, and

- This device must be accepted any interference received, including interference that may cause undesired operation.

### CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

## **CE**

Fiberroad Technology Co., Limited hereby declares that this device is compliance with Directive 2014/30/EU. A copy of the EU Declaration of conformity is available at

<https://fiberroad.com/en/resources/certificates/>



[www.fiberroad.com](http://www.fiberroad.com)

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