100Base-FX to 10/100Base-TX

PoE

Media Converter

FCU-1802Px

User's Manual

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FCC Warning

This equipment has been tested and found to comply with the regulations for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Energy Saving Note of the Device

This power required device does not support Standby mode operation.

For energy saving, please remove the DC-plug or push the hardware Power Switch to OFF position to disconnect the device from the power circuit.

Without removing the DC-Plug or switching to OFF, the device will still consume power from the power source. In the view of Saving Energy and reducing unnecessary power consumption, it is strongly suggested to power off or to remove the DC-plug for the device if this device is not intended to be active.

WEEE Warning

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

User's manual for Antaira 100Base-FX to 10/100Base-TX PoE Media Converter

Rev 1.1 (April 2013)

Part No. 2350-AA3540-470

Table of Contents

1. Overview

Thank you for purchasing Antaira's FCU-1802Px family of 10/100Mbps Ethernet Twisted pair to 100Base-FX Fiber-optic PoE Bridge Converter. This converter is used to convert one type media signal to another easily, efficiently and inexpensively. The converter provides Power over Ethernet power injector function which is able to drive one IEEE 802.3af compliant powered devices.

About the Power over Ethernet Injector

The FCU-1802Px has an IEEE 802.3af Power over Ethernet Injector that provides DC 48V over Ethernet cables. The FCU-1802Px IEEE 802.3af Power over Ethernet Injector inserts DC Voltage into Cat.5 cable, allowing the cable between the Injector (FCU-1802Px) and PoE PD (Powered Device) to transfer data and power simultaneously. The maximum distance between the Injector (FCU-1802Px) and PoE PD is 100 meters. With the FCU-1802Px installed, it combines the Ethernet digital data with power over the twisted pair cables as an IEEE 802.3af Power over Ethernet Injector. And the IEEE 802.3af Power over Ethernet splitter shall separate the digital data and the power into two outputs.

With IEEE 802.3af Power over Ethernet devices installed, the system administrator only has to use a single RJ-45 Ethernet cable to carriy both power and data to each device. Aside from connecting through the FCU-1802Px and PoE PD, you can also have the benefit of cost saving, easy for networking planning, and higher reliability. Moreover, upon any IEEE 802.3af device installation, the FCU-1802Px or PD can make the connection while migrating the Ethernet digital packets, such as connecting the FCU-1802Px to an IEEE 802.3af complied devices, AP or IP Camera.

2. Checklist

Your FCU-1802Px package should contain the following items:

- 100Base-FX to 10/100Base-TX PoE Media Converter x 1
- AC-DC Power Adapter (Input: 48V DC, 0.4A max.) x 1
- User's Manual x 1

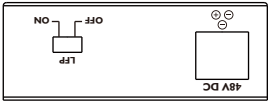
If any items are missing or damaged, please consult the dealer from which you purchased your PoE Media Converter.

3. Product Outlook

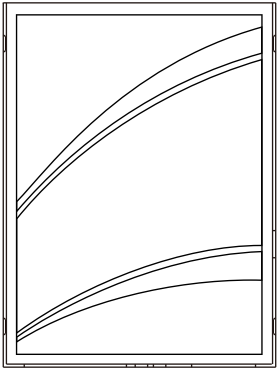
Overview

Layout of the FCU-1802Px.

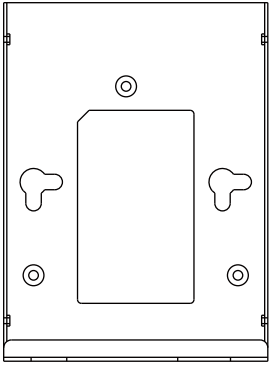
Rear Panel

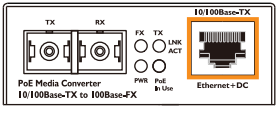


TOP Panel



Bottom

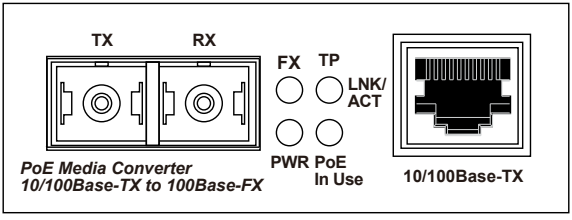




Front Panel

Left View

There are one RJ-45 Twisted-Pair jack (Auto-MDI/MDI-X), one fiber-optic connector (vary by model) and four LED indicators.



Right View

One DIP switch for Link Fault Pass Through (LFP) feature, **"ON"** to turn-on the LLCF and LLR detection. And "OFF" to turn –off this feature. Please refer to the following sections for more. Also one DC 48V power socket for the PoE Media Converter.

4. Link Fault Pass through (LFP)

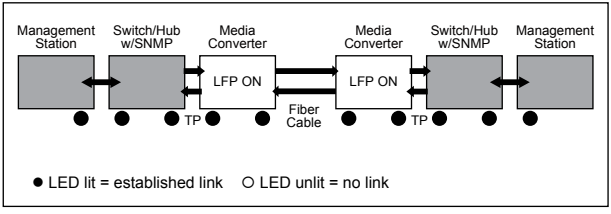
The LFP function includes the Link Fault Pass Through function (LLCF/LLR) and the DIP Switch design. LLCF/LLR can immediately alert administrators about problems with the link media and provide an efficient solution to monitor the net. The DIP Switch can disable or enable the LFP function.

With LLCF (Link Loss Carry Forward), when a device connected to the converter loses the TP line link, the converter's fiber will disconnect the link of transmit. With LLR (Link Loss Return), when a device connected to the converter and loses the fiber line link, the converter's fiber will disconnect the link of transmit. Both can immediately alert administrators about link media problems and provide an efficient solution to monitor the net.

Link Loss Carry Forward (LLCF)

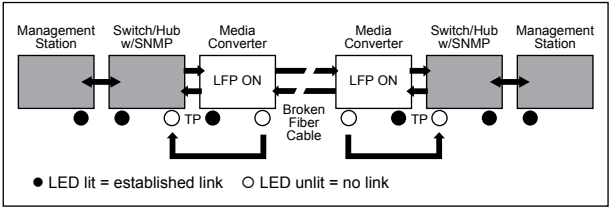
The FCU-1802Px incorporates an LLCF function for troubleshooting a remote connection. When LFP function is enabled, the FL/TP ports do not transmit a link signal until they receive a link signal from the opposite port.

The diagram below shows a typical network configuration with a good link status using the FCU-1802Px for remote connectivity.



If the connection breaks, the FCU-1802Px link loss forwards to the switch/hub that generates a trap to the management

station. The administrator can then determine the source of the problem.



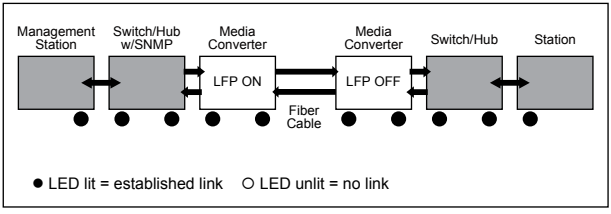
*Units are shipped with the LFP function disable (OFF).

Link Loss Return (LLR)

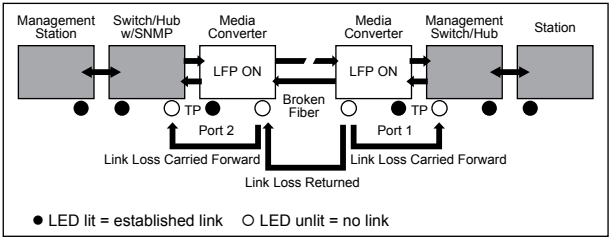
The fiber ports of the FCU-1802Px have been designed with an LLR function for troubleshooting a remote connection. LLR works in conjunction with LLCF.

When LFP function is enabled, the port's transmitter shuts down when its receiver fails to detect a valid receive link. LLR should only be enabled on one end of the link and is typically enabled on either the unmanaged or remote device.

The diagram below shows a typical network configuration with a good link status using the FCU-1802Px for remote connectivity. Note that LLR and LLCF are enabled as indicated in the diagram.



If one of the optical conductors is bad (as shown in the diagram box below), the converter with LLR function will return a no-link condition to its link partner. With LLCF function also enabled, the no-link condition is carried forward to the switch/hub where a trap is generated to the management station, and the administrator can then determine the source of the loss.



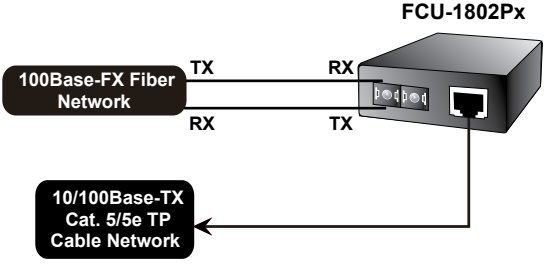
Note

LFP function is turned on by default. This feature can also be turned off via the side DIP-switch. If you are familiar with the network installation, for diagnostic purpose (i.e. check which end is broken), you can turn it off and reset the converter to make it take effect. Otherwise, please leave it at the default position.

5. Installing the Converter

Please follow these steps to install the PoE Media converter:

- Turn off the power of the device/station on the network to which the FCU-1802Px will be attached.
- Ensure that there is no activity in the network.
- Attach fiber cable from the FCU-1802Px to the fiber network. TX, RX must be paired at both ends.
- Attach a Cat. 5 UTP cable from the 10/100Base-TX network to the RJ-45 port on the FCU-1802Px.
- Connect the 48V DC power adapter to the FCU-1802Px and verify that the Power LED is lit.
- Turn on the power of the device/station, the TX Link and FX Link LEDs should light when all cables are attached.



Note

- RJ-45/STP, UTP Cat 5, straight /crossover cable is accepted.
- Please refer to section 9 for more about the wiring distance of your TP, Optic-fiber networks.

6. PoE function

FCU-1802Px and the IEEE 802.3af Injector / Splitter equipment installation:

Before your installation, it is recommended to check your network environment. If there is any IEEE 802.3af devices that need to power on, the FCU-1802Px can provide a way to supply power for this Ethernet device conveniently and easily. The FCU-1802Px comes with an AC-DC adapter with DC 48V input and injects this DC power into the pin of the twisted pair cable (pair 1, 2 and pair 3, 6).

7. LED indication

- **System**

LED	Color	Function
PWR	Green	**Lit:** Indicate the device is powered.

- **10/100Base-TX Port**

LED	Color	Function	
LNK/ACT	Green	**Blink**	Indicate that the Media Converter is actively sending or receiving data over that port.
		Lit	Indicate that the port is link up.
		Off	Indicate that the port is link down.
PoE in Use	Green	**Lit**	Indicate that the port is providing 48VDC to remote powered device.
		Off	Indicate that the port is not providing 48VDC to remote powered device.

- **100Base-FX SC Port**

LED	Color	Function	
LNK/ACT	Green	**Blink**	Indicate that the Media Converter is actively sending or receiving data over that port.
		Lit	Indicate that the port is link up.
		Off	Indicate that the port is link down.

Fiber-optic Partner should be set to the correct mode according to this FDX indicator for optimal network performance.

8. Cable Connection Parameter

The limitations are as below:

Duplex	Connection	Limitation (max.)
Twisted Pair		
Half / Full	Node to Node Node to Switch/Hub	100 meters
Multi-Mode Converters		
MM Half	Node to Node Node to Switch	412 meters
MM Full	Node to Node Node to Switch	2 kilometers
Single-Mode Converters		
SM Full	Node to Node Node to Switch	15 kilometers

9. FCU-1802Px Technical Specifications

The FCU-1802Px comes with the following standard features:

- **Standard:** IEEE 802.3u, 10/100Base-TX ,100Base-FX
  IEEE 802.3af Power over Ethernet
- **Connectors:**
  - One RJ-45 (Auto-MDI/MDI-X) Twisted Pair, EIA568 with PoE
  - One Fiber-optic, 1310nm wavelength, connector-type vary with model
- **Data Transfer Rate:** 10/100Mbps (TP), 100Mbps (FX)
- **Duplex mode support:** Full or half-duplex mode by Auto-Negotiation (TP)
- **LED indicators:** PWR, FX LNK/ACT, TX LNK/ACT, PoE in Use
- **PoE Power Output:** 48V DC, Max. 15.4 watts, 350mA
- **Power Pin Assignment:** 1/2(+), 3/6(-) / End-Span
- **Power Supply:** 48V DC, 0.4A, external AC-DC adapter
- **Ambient Temperature:** 0° to 50°C (operating)
- **Humidity:** 5% to 90% (non-condensing)
- **Dimension:** 26 x 70 x 97mm (H x W x D)
- **Cable:**
  - UTP: Cat 5 UTP cable
  - Fiber: MM: 50/125 μm or 62.5/125 μm optic fiber
  - Fiber: SM: 9/125 μm optic fiber

Connecting to Router, Bridge, or Switch, Hub, please refer to the device's Technical Manual.

APPENDIX A

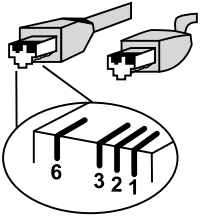
A.1 Device's RJ-45 Pin Assignments

- **10/100Mbps, 10/100Base-TX**

Contact	MDI	MDI-X
1	1 (TX +)	3
2	2 (TX -)	6
3	3 (RX +)	1
6	6 (RX -)	2
4, 5, 7, 8	Not used	Not used

Implicit implementation of the crossover function within a twisted-pair cable, or at a wiring panel, while not expressly forbidden, is beyond the scope of this standard.

A.2 RJ-45 cable pin assignment



There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight cable and crossover cable connection:

Figure A-1: Straight-Through and Crossover Cable

Please make sure your connected cables are with the same pin assignment and color as the above picture before deploying the cables into your network.

A.3 Fiber Optical Cable Connection Parameter

The wiring details are as below:

- **Fiber Optical patch Cables:**

Standard	Fiber Type	Cable Specification
100Base-FX (1310nm)	Multi-mode	50/125μm or 62.5/125μm
100Base-FX (1310nm)	Single-mode	9/125μm

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