10/100/1000Base-T to 1000Base-SX/LX

Gigabit Ethernet Media Converter

User's Manual

Trademarks

Contents subject to revision without prior notice.

Antaira is a registered trademark of Antaira Technologies. The information in this manual is subject to change without notice. All other trademarks belongs to their respective owners.

Disclaimer

Antaira Technologies does not warrant that the hardware will work properly in all environments and applications, and makes no warranty and representation, either implied or expressed, with respect to the quality, performance, merchantability, or fitness for a particular purpose.

Antaira has made every effort to ensure that this User's Manual is accurate; Antaira disclaims liability for any inaccuracies or omissions that may have occurred.

Information in this User's Manual is subject to change without notice and does not represent a commitment on the part of Antaira. Antaira assumes no responsibility for any inaccuracies that may be contained in this User's Manual. Antaira makes no commitment to update or keep current the information in this User's Manual, and reserves the right to make improvements to this User's Manual and/or to the products described in this User's Manual, at any time without notice.

If you find information in this manual that is incorrect, misleading, or incomplete, we would appreciate your comments and suggestions.

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 Gigabit Ethernet Converter

Rev 3.1 (November 2013)

Part No: 2010-AA4230-470

Table of Contents

1. PRODUCT FEATURES

- Complies with IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.3ab 1000Base-T, IEEE 802.3z 1000Base-SX/LX Ethernet standard
- Bridge mode Media Converter with TP port supports 10/100/1000Base-T and auto-MDI / MDIX
- Auto-Negotiation for 10/100/1000Base-T; Half-duplex or Full-duplex for 10Mbps and 100Mbps, full-duplex for 1000Mbps
- LED indicators for simple diagnostics and management
- Provides DIP switch for LFP function (Disable / Enable) setting
- Compact in size, easy installation
- OAM (TS-1000 and IEEE 802.3ah) supported
- 9K Jumbo frame supported
- Can be installed on Antaira's Media Converter Chassis

2. CHECKLIST

Your FCU-280x package should contain the following items:

- The Gigabit Ethernet Media Converter
- AC-DC Power Adapter (Output: 5VDC, 2A max.)
- This User's Manual

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

WDM models has one vacant SFP module slot. The mini GBIC SFP module is not bundled with the package.

3. PRODUCT OUTLOOK

Overview

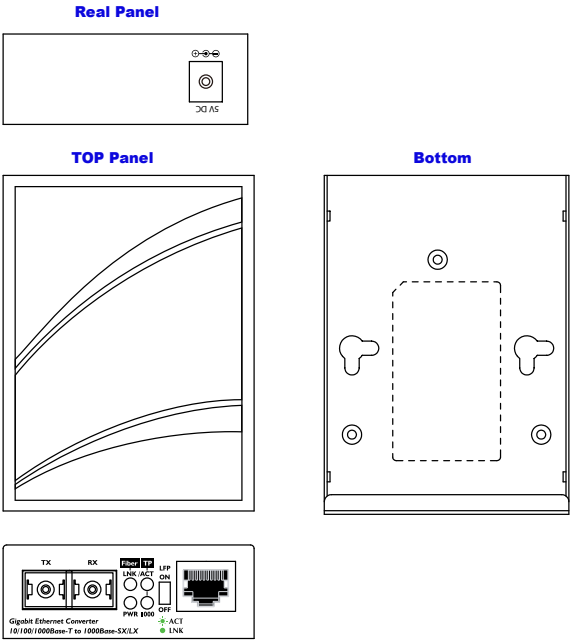
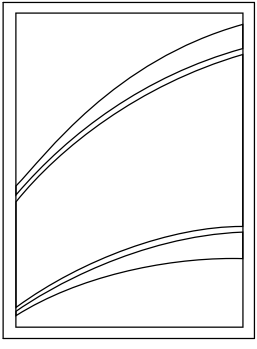


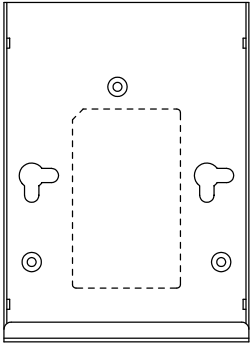
Figure 1: Multi-Mode/Single-Mode Duplex Model

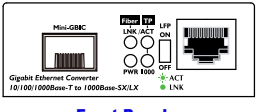
Real Panel

TOP Panel



Bottom





Front Panel

Figure 2: SFP Model

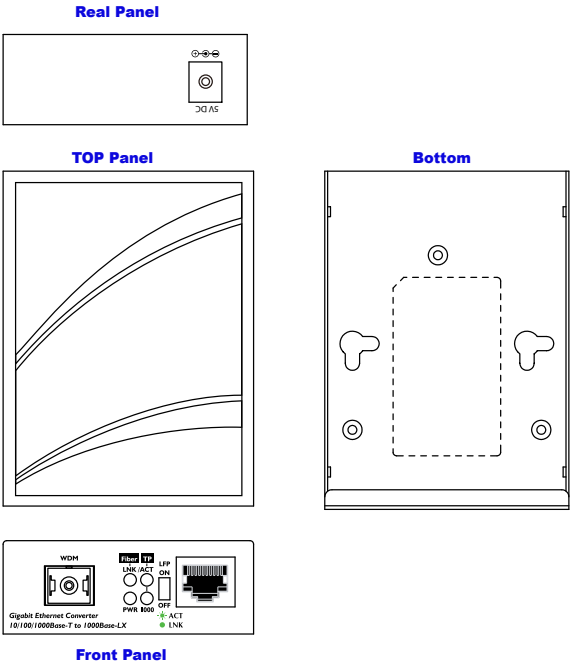


Figure 3: WDM (Single-Strand Fiber) Model

Left View

The Front Panel of the Gigabit Ethernet Media Converter consists of one 1000Base-SX / 1000Base-LX / mini-GBIC SFP / 1000Base-LX WDM ports and one Auto-Sensing 10/100/1000Mbps Ethernet RJ-45 Port, one DIP switch for LFP ON/OFF. Figure 4 & 5 & 6 shows a front panel of Gigabit Ethernet Media Converter.

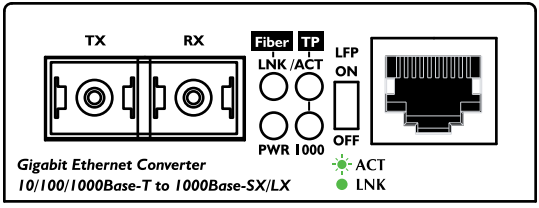


Figure 4: Multi-Mode/Single-Mode Duplex Model

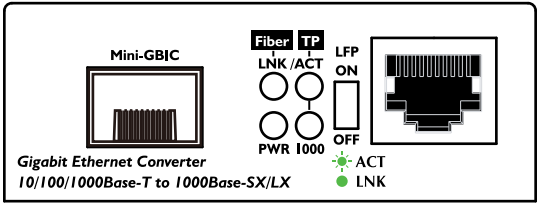


Figure 5: SFP Model

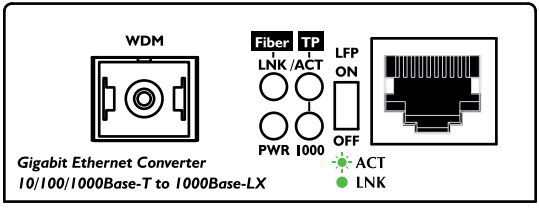


Figure 6: WDM (Single-Strand Fiber) Model

Rear View

The rear panel of the Gigabit Ethernet Media Converter indicates one DC jack, which accepts input power with 5V DC 2A.

Figure 7: One DC jack for DC power input.

Note

The device is a power-required device, it means, it will not work till it is powered. If your networks should be active all the time, please consider using a UPS (Uninterrupted Power Supply) for your device. It will prevent you from network data loss or network downtime.

In some areas, installing a surge suppression device may also help to protect your Gigabit Ethernet Media Converter from being damaged by unregulated surge or current to the converter or the power adapter.

4. LINK FAULT PASS THROUGH (LFP)

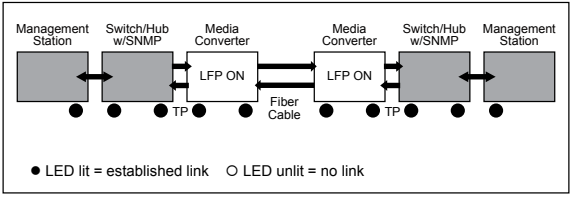
The LFP function includes the Link Fault Pass Through function (LLCF/LLR) and the DIP Switch design. LLCF/LLR can immediately alert administrators about problems with the link media and provide an efficient solution to monitor the net. The DIP Switch can disable or enable the LFP function.

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.

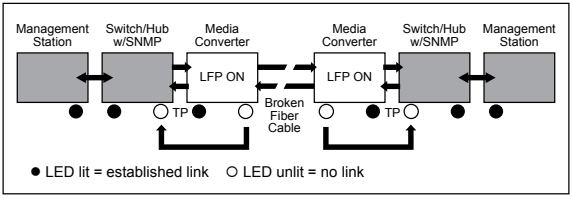
Link Loss Carry Forward (LLCF)

The FCU-280x 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-280x for remote connectivity.



If the connection breaks, the FCU-280x link loss forwards to the switch/hub that generates a trap to the management station. The administrator can then determine the source of the issue.



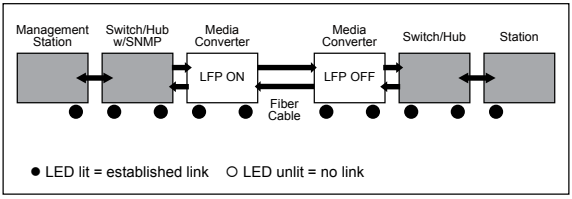
*Units are shipped with the LFP function enabled (ON).

Link Loss Return (LLR)

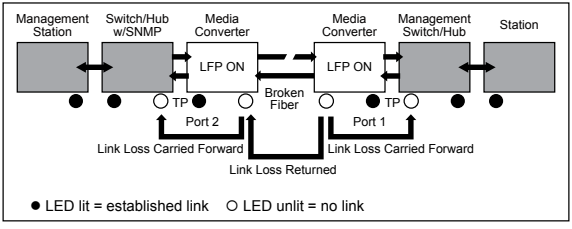
The fiber ports of the FCU-280x have been designed with an LLR function for troubleshooting a remote connection. LLR works in conjunction with LLCF.

When LFP function is enabled *(by default), 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-280x 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

Stand-alone Installation

To install a FCU-280x stand-alone, on a desktop or shelf, simply follow the steps below:

Step 1: Turn off the power of the device/station on the network to which the FCU-280x will be attached.

Step 2: Ensure that there is no activity in the network.

Step 3: Attach fiber cable from the FCU-280x to the fiber network. TX, RX must be paired at both ends.

Step 4: Connect the 5VDC power adapter to the FCU-280x and verify that the Power LED is lit.

Step 5: Turn on the power of the device/station; the PWR LEDs should light when all cables are attached.

Figure 8: FCU-280x installation

Note	To prevent from optic acceptor malfunction, check both wires / transmitter before powering on the converter.

SFP Model Installation

Step 1: Connect the fiber cable. Attach the duplex LC connector on the network cable into the SFP transceiver.

Step 2: Attach fiber cable from the media converter to the fiber network. TX, RX must be paired at both ends.

Step 3: Connect the 5VDC power adapter to the media converter and verify that the Power LED is lit.

Step 4: Turn on the power of the device/station; the PWR LEDs should light when all cables are attached.

Figure 9: SFP Model installation

Note

It's recommended that Antaira SFP Modules be used in the Antaira converters. If you insert a SFP transceiver that is not supported, the converter will not recognize it.

6. DUPLEX MODE SUPPORT

The FCU-280x is one-channel media conversion between 10/100/1000Base-T and 1000Base-SX/LX. The 10/100/1000Base-T port can work under Auto-negotiation mode. However, the 1000Base-SX/LX fiber port only works under forced 1000Mbps full duplex mode.

7. LED INDICATION

LED	Color	Description
PWR	Green	**Lit:** When +5VDC power detected.
Fiber LNK/ACT	Green	**Lit:** To indicate the link through that fiber port is successfully established. **Blink:** Indicates that the fiber port is actively sending or receiving data.
TP LNK/ ACT	Green	**Lit:** To indicate the link through that port is successfully established. **Blink:** Indicates that the port is actively sending or receiving data.
TP 1000	Green	**Lit:** When the port runs in 1000Mbps Full duplex. **Off:** When the port runs in 10/100Mbps Full duplex.

8. CABLE CONNECTION PARAMETER

The wiring details are as below:

Cables:

Standard	Fiber Type	Cable Specification
1000Base-SX (850nm)	Multi-mode	50/125μm or 62.5/125μm
1000Base-LX (1300nm)	Multi-mode	50/125μm or 62.5/125μm
	Single-mode	9/125μm

Wiring Distances:

Standard	Fiber	Diameter (micron)	Modal Bandwidth (MHz * km)	Max. Distance (meters)
1000Base-SX	MM	62.5 62.5 50 50	100 200 400 500	220 275 500 550
1000Base-LX	MM	62.5 50 50	5 4 5	550
	SM	9	N/A	5000*

9. PRODUCT SPECIFICATION

The FCU-280x comes with the following standard features:

Model: FCU-	2802SC	2802SC-S10	2805SFP	2802WA-S10 2802WB-S10
Hardware Version	Version 3			
Connector – Fiber	SC-type connector		SFP, LC type	SC-type connector (WDM) LX
Mode	Multi-mode	Single mode	Vary on module	Single mode
Fiber Maximum Distance	220m / 550m	10km	Vary on module	10km
Connector - Copper	10/100/1000Mbps RJ-45			
Modes	Full Duplex, auto-negotiation			
Packet Forwarding Rate (64bytes)	14880pps @10Mbps 148810pps @100Mbps 1488000pps @ 1000Mbps			
LED indicators:	PWR, 1000, Fiber/LNK/ACT, TP/LNK/ACT			
DIP switch	LFP function (Disable / Enable) setting			
Protocols and Standards:	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX IEEE 802.3ab 1000Base-T IEEE 802.3z 1000Base-SX/LX			

Cable	10/100/1000Base-T: 1000Base-T-2-pair UTP Cat. 5/5e/6, up to 100m 1000Base-SX : 50/125μm or 62.5/125μm multi-mode fiber optic cable, up to 220/550m (SC) 1000Base-LX : 9/125μm single-mode fiber optic cable 9/125μm single-mode fiber optic cable, up to 10/15/20/30/40/50/60/70/120km (vary on fiber transceiver or SFP module)
OAM	TS-1000, IEEE 802.3ah terminal
Jumbo Packet Size	9K
Dimensions	26 x 70 x 97mm (H x W x D)
Power	External power adaptor 5V 2A max.
EMI Compatibility:	FCC Class A, CE Certification Class A
Temperature:	Storage: -10°C ~ 70°C / Operating: 0°C ~ 50°C
Humidity:	5% ~90% non-condensing

Connecting to Gigabit Ethernet products, please refer to the device's Technical Manual.

This page is intentionally left blank