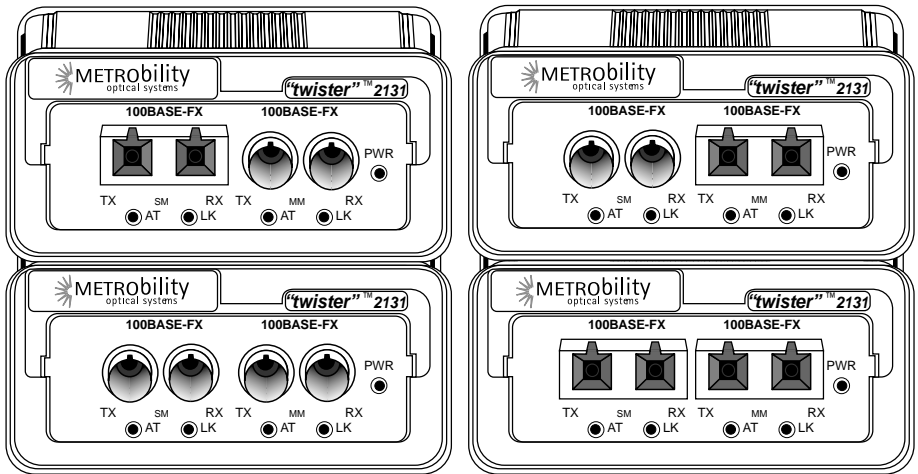


# “twister”™ 2131 100Mbps Multimode-to-Singlemode Media Converter



## *Installation & User Guide*

Models: 2131-34-01 / 2131-36-01 / 2131-54-01 / 2131-56-01

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## **Metrobility “twister”™ Media Converters**

### *100Mbps “twister”™ Standalone Units:*

- 2131-13-01 \_\_\_\_ TX to FX multimode SC; universal AC
- 2131-14-01 \_\_\_\_ TX to FX singlemode SC; universal AC
- 2131-15-01 \_\_\_\_ TX to FX multimode ST; universal AC
- 2131-16-01 \_\_\_\_ TX to FX singlemode ST; universal AC
- 2131-17-01 \_\_\_\_ TX to FX singlemode SC (40km); universal AC
- 2131-1A-01 \_\_\_\_ TX to SX multimode SC; universal AC
- 2131-1B-01 \_\_\_\_ TX to SX multimode ST; universal AC
- 2131-1J-01 \_\_\_\_ TX to FX singlemode SC (100km); universal AC
  
- 2131-34-01 \_\_\_\_ FX multimode SC to FX singlemode SC; universal AC
- 2131-36-01 \_\_\_\_ FX multimode SC to FX singlemode ST; universal AC
- 2131-54-01 \_\_\_\_ FX multimode ST to FX singlemode SC; universal AC
- 2131-56-01 \_\_\_\_ FX multimode ST to FX singlemode ST; universal AC

### *10Mbps “twister”™ Standalone Units:*

- 2111-12-01 \_\_\_\_ RJ-45 to BNC; universal AC
- 2111-12-02 \_\_\_\_ RJ-45 to BNC; domestic AC
- 2111-13-01 \_\_\_\_ RJ-45 to FL multimode SC; universal AC
- 2111-13-02 \_\_\_\_ RJ-45 to FL multimode SC; domestic AC
- 2111-15-01 \_\_\_\_ RJ-45 to FL multimode ST; universal AC
- 2111-15-02 \_\_\_\_ RJ-45 to FL multimode ST; domestic AC
- 2111-16-01 \_\_\_\_ RJ-45 to FL singlemode ST; universal AC
- 2111-16-02 \_\_\_\_ RJ-45 to FL singlemode ST; domestic AC
- 2111-18-01 \_\_\_\_ RJ-45 to FL multimode SMA; universal AC
- 2111-18-02 \_\_\_\_ RJ-45 to FL multimode SMA; domestic AC

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# Table of Contents

## **“twister” 2131 Multimode-to-Singlemode Media Converter Installation & User Guide**

- Introduction** ..... 4
- Overview** ..... 5
- Installation Guide** ..... 6
  - STEP 1: Unpack the “twister” and Accessories ..... 6
  - STEP 2: Choose an Appropriate Location ..... 6
  - STEP 3: Set the LLCF Switch ..... 7
  - STEP 4: Connect to the Network ..... 8
  - STEP 5: Apply Power ..... 9
- User Guide** ..... 11
  - System LEDs ..... 11
  - Topology Solutions ..... 11
  - Link Loss Carry Forward (LLCF) ..... 12
  - Technical Specifications ..... 13
  - Product Safety, EMC and Compliance Statements ..... 14
  - Warranty and Servicing ..... 15

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The information contained in this document is assumed to be correct and current. The manufacturer is not responsible for errors or omissions and reserves the right to change specifications at any time without notice.

# *Introduction*

**Thank you for choosing the Metrobility “twister” media converter.**

Metrobility “twister” media converters represent the hottest technology available for extending Ethernet and Fast Ethernet networks. Since Metrobility first developed “twister” media conversion, it has become a standard for providing a cost-effective means of integrating a mixed media environment. As LANs grow and evolve, this technology provides an ideal solution for building effective migration strategies.

These IEEE 802.3u compliant media converters are compatible with Fast Ethernet devices from other leading network technology providers. This increases the flexibility of your network configuration by ensuring reliable data transmission in multi-vendor as well as mixed media environments.

The information in this guide will help you to install and start using your “twister” media converter.

# Overview

The Metrobility “twister” 2131 multimode-to-singlemode (MM-to-SM) media converters provide seamless high-speed integration of multimode and singlemode fiber optic segments in Fast Ethernet environments. The “twister” 2131 supports remote fiber optic links up to 2km over multimode and up to 15km over singlemode fiber optic cable.

To optimize your Fast Ethernet network, this innovative media converter provides seamless operation in half-duplex or full-duplex environments. Full signal restoration —with a low bit delay — ensures accurate data transmission to and from LANs within an organization. All signal activity is completely converted ensuring accurate communication and collision detection in connected segments and allowing maximum media length to be achieved on either side of the device.

The “twister” 2131 provides the following key feature:

- A Link Loss Carry Forward (LLCF) enable/disable switch to provide an easy means for troubleshooting a remote network connection. Refer to the section of this guide titled “Link Loss Carry Forward” for more information.

Whether you are updating or expanding your existing network, the Metrobility line of “twister” media converters supports a wide range of configuration needs. The “twister” multimode-to-singlemode media converters include the following media conversion combinations:

2131-34-01	_____	FX multimode SC to FX singlemode SC
2131-36-01	_____	FX multimode SC to FX singlemode ST
2131-54-01	_____	FX multimode ST to FX singlemode SC
2131-56-01	_____	FX multimode ST to FX singlemode ST

# Installation Guide

Follow the simple steps outlined in this section of the guide to install and start using your Metrobility “twister” media converter.

## 1 **Unpack the “twister” and Accessories**

Check that the following components have been included with your order:

- “twister” 2131 media converter
- Power supply
- Power cord
- Four (4) rubber feet

Your order has been provided with the safest possible packaging, but shipping damage does occasionally occur. Inspect your order carefully. If you discover any shipping damage, notify the carrier and follow their instructions for damage and claims. Save the original shipping carton if return or storage of the unit is necessary.

## 2 **Choose an Appropriate Location**

The “twister” MM-to-SM media converter is intended for use in either office or industrial environments. The unit must be located within six (6) feet of the AC power source being used and placed as far away as possible from electrical noise generating equipment such as copiers, electrostatic printers and other motorized equipment. If exposed twisted-pair wiring is used nearby, the wiring should be routed as far away as possible from power cords and data cables to minimize interference.

The units may be oriented in any manner which permits you to make physical connection to the power supply and leaves a minimum of six (6) inches of space for proper ventilation.

*TUV Compliance Note: For pluggable equipment, the socket outlet must be installed near the equipment and be easily accessible.*

*~~Bei Gerätezugang über Steckanschluss muß die Steckdose nahe dem Gerät angebracht~~*

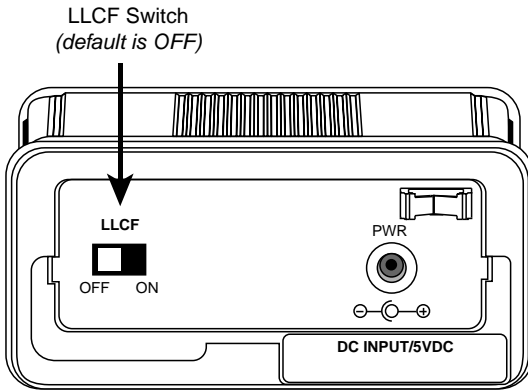
### 3 **Set the LLCF Switch**

#### **Link Loss Carry Forward (LLCF) Switch.**

The MM-to-SM media converter incorporates Link Loss Carry Forward (LLCF) functionality as an aid in troubleshooting a remote connection.

A switch for enabling/disabling LLCF is located on the rear panel of the converter. When LLCF is enabled, the FX ports on the “twister” media converter do not transmit a link signal until they receive a link signal from the opposite port. Refer to the page titled “Link Loss Carry Forward” in the User Guide section of this manual for more detailed information.

The unit is shipped with the LLCF disabled. To reset the LLCF, simply slide the switch to the appropriate setting.



# 4

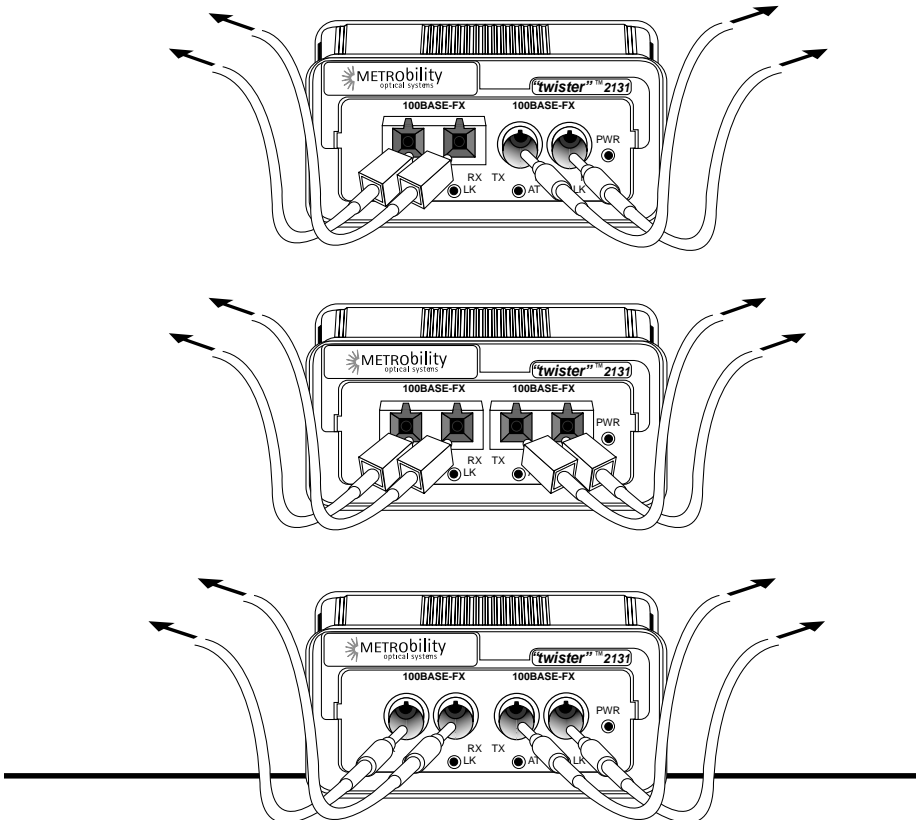
## Connect to the Network

The Metrobility “twister” 2131 MM-to-SM media converter offers the ease of plug-and-play installation.

The 2131 MM-to-SM media converters provide one duplex multimode SC/ST port and one duplex singlemode SC/ST port for 100BASE-FX connections. The multimode connectors support links up to 2km and the singlemode connectors support links up to 15km.

When making fiber optic connections, be sure that the transmit (TX) port of the “twister” media converter connects to the receive (RX) port of the connected device; and be sure that the transmit (TX) port of the connected device connects to the receive (RX) port of the “twister” media converter.

Once power is applied to the unit, correct connectivity can be verified via the Link (LK) LED. The LK LED is lit provided there is an active device sending idle link signals connected to the other end of the cable.

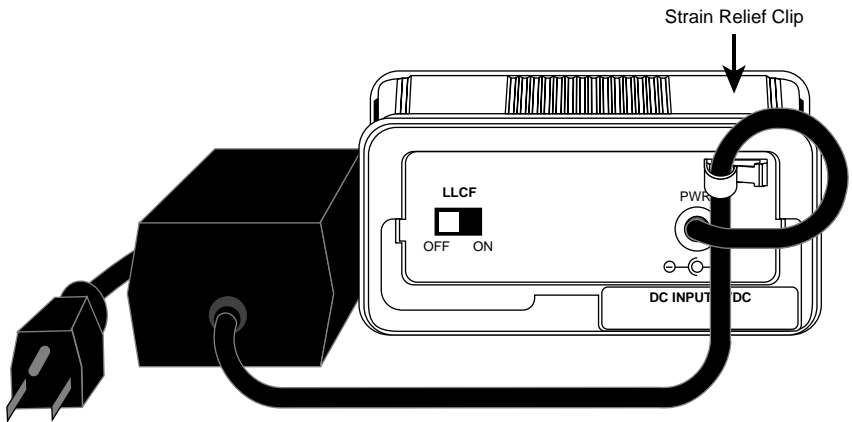




## 5 Apply Power

Power is provided to the “twister” unit from the desktop power supply module. This power module is equipped with a S760 hollow-type plug for insertion into the DC jack located on the back of the “twister” unit and standard IEC 320-type AC power receptacle.

When making power connections, it is recommended that the DC power cord be connected to the DC input jack located on the back of the “twister” media converter *before* making the AC connection to the outlet. Be sure to seat the power cord into the strain relief clip to ensure against accidental disconnection.



Upon receiving power, the “twister” media converter goes into normal operation mode and automatically provides the appropriate signal translation between the connected network segments.

Be sure to verify correct segment connectivity via the link (LK) LEDs on the front of the unit.

If an additional extension cord is used to connect the power module to the power source, the following guidelines must be followed.

While one end of the AC power cord can be fitted with whatever plug is standard for the country of operation, the end that connects to the “twister” 2131 power supply module must have a female plug that fits this type of AC receptacle.

- AC 115V (North American): use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, type SVT or SJT three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15A, 125V.
- AC 230V (USA): use a UL-listed cord set consisting of a minimum No. 18 AWG, type SVT three-conductor cord, a maximum of 15 feet in length and a Tandem blade grounding-type attachment plug rated 15A, 250V.
- 240V (outside USA): use a cord set consisting of a minimum No. 18 AWG cord and grounding-type attachment plug rated 15A, 250V. The cord set should have the appropriate safety approvals for the country in which the “twister” media converter is installed and marked HAR.

# User Guide

This section contains more detailed information regarding the operating features for the Metrobility 2131 “twister” media converter.

## System LEDs

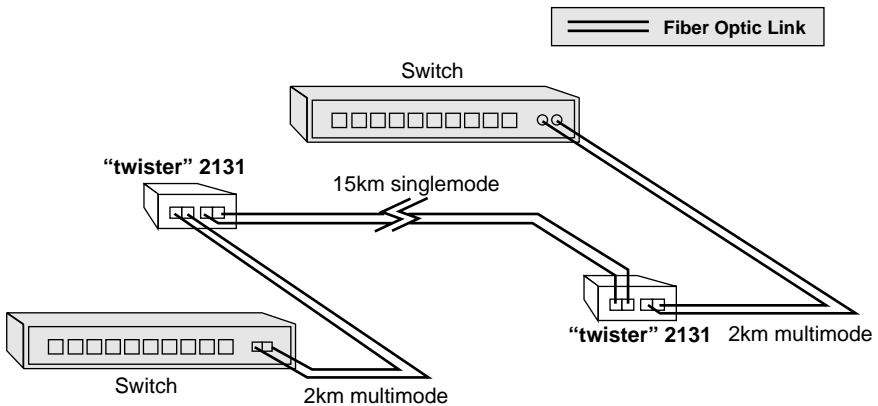
The Metrobility “twister” MM-to-SM media converter provides LEDs for the visible verification of unit status and proper functionality as well as aiding in troubleshooting and overall network diagnosis and management.

LEDs indicate the following:

- PWR (power): the unit is ON and functioning in normal operation mode.
- LK (link): satisfactory link status on the respective port.
- AT (activity): the port is receiving data.

Once power is applied to the unit, verify correct connectivity via the LK LED.

## Topology Solutions

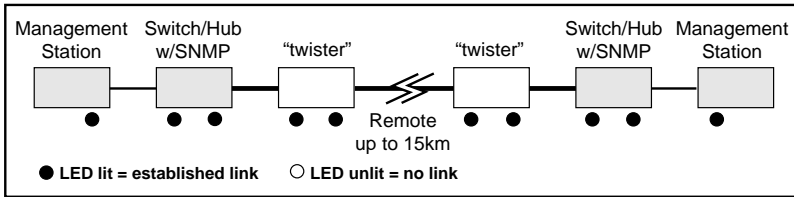


## Link Loss Carry Forward (LLCF)

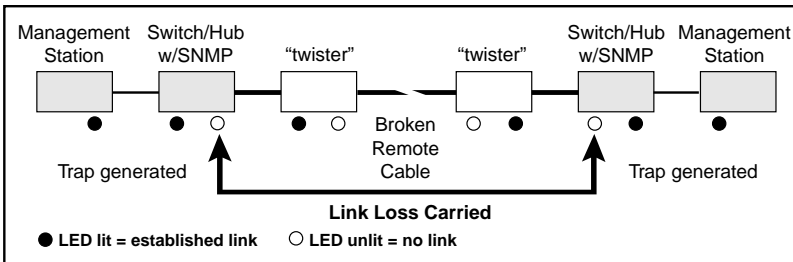
The “twister” 2131 has been designed with LLCF functionality for troubleshooting a remote connection. The unit is shipped with the LLCF disabled.

When LLCF is enabled, the FX ports on the “twister” do not transmit a link signal until they receive a link signal from the opposite port. For example, if LLCF is enabled and two “twister” units are connected via a fiber cable with nothing else connected to them, the Link LED does *not* illuminate. When a valid link is established, a complete connection is accomplished.

The diagram below shows a typical network configuration using “twister” media converters for remote connectivity.



If the fiber connection breaks, or the remote device fails, the “twister” media converters carry that link loss all the way to the switch/hub which generates a trap to the management station. The administrator can then look at the unit to determine the source of the loss.



**IMPORTANT:** When connecting a “twister” 2131 media converter to a port that supports auto-negotiation, it is strongly recommended to fix the port setting to the appropriate speed (100Mbps or 10Mbps) and to either full or half duplex. This allows the media converter to sense receive link and select the active port.

# Technical Specifications

## Data Rate

Data Rate \_\_\_\_\_ 100Mbps half duplex  
\_\_\_\_\_ 200Mbps full duplex  
Bit Delay \_\_\_\_\_ < 40 bits

## Network Connections

### Multimode Fiber Optic Interface

Connector \_\_\_\_\_ ST or SC  
RX Input Sensitivity \_\_\_\_\_ -31 dBm peak minimum  
Output Power \_\_\_\_\_ -14 dBm to -23.5 dBm (50/125  $\mu$ m)  
\_\_\_\_\_ -14 dBm to -20 dBm (62.5/125  $\mu$ m)  
Supported Link Length \_\_\_\_\_ up to 2km full duplex  
Cable Type \_\_\_\_\_ 50/125, 62.5/125, 100/140  $\mu$ m F/O

### Singlemode Fiber Optic Interface

Connector \_\_\_\_\_ ST or SC  
RX Input Sensitivity \_\_\_\_\_ -31 dBm peak minimum  
Output Power \_\_\_\_\_ -8 dBm to -15 dBm (9/125  $\mu$ m)  
Supported Link Length \_\_\_\_\_ up to 15km full duplex  
Cable Type \_\_\_\_\_ 8.3/125, 8.7/125, 9/125, 10/125  $\mu$ m F/O

## Power

Input \_\_\_\_\_ 90-260V AC 50/60 Hz  
Output \_\_\_\_\_ +5VDC @ 1.2 A

## Environmental

Operating Temperature \_\_\_\_\_ 0° to 55° C  
Storage Temperature \_\_\_\_\_ -25° to 70° C  
Relative Humidity \_\_\_\_\_ 5% to 95% non-condensing  
Physical Case \_\_\_\_\_ Fully enclosed metal construction  
Dimensions \_\_\_\_\_ 4.83" L x 3.26" W x 1.71" H  
\_\_\_\_\_ 12.3 cm x 8.3 cm x 4.3 cm  
Weight (including power supply) \_\_\_\_\_ 3 lb, 1.36 kg

## Regulatory

Compliance \_\_\_\_\_ IEEE 802.3u 100BASE-FX

## **Product Safety, EMC and Compliance Statements**

This equipment complies with the following requirements:

- UL
- CSA
- EN60950 (safety)
- FCC Part 15, Class A
- EN55022 Class A (emissions)
- EN50082-1 (immunity)
- IEEE 802.3u
- IEC 825-1 Classification
- Class 1 Laser Product

This product shall be handled, stored and disposed of in accordance with all governing and applicable safety and environmental regulatory agency requirements.

The following *FCC* and *Industry Canada* compliance information is applicable to North American customers only.

### **USA FCC Radio Frequency Interference Statement**

This equipment has been tested and found to comply with the limits 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 the instruction manual, 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.

***Caution:** Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

### **Canadian Radio Frequency Interference Statement**

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## ***Warranty and Servicing***

### **Three-Year Warranty for Metrobility “twister” Media Converters**

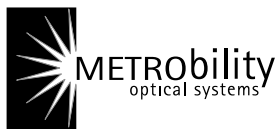
Metrobility Optical Systems, Inc. warrants that every “twister” media converter will be free from defects in material and workmanship for a period of THREE YEARS. This warranty covers the original user only and is not transferable. Should the unit fail at any time during this warranty period, Metrobility will, at its sole discretion, replace, repair, or refund the purchase price of the product. This warranty is limited to defects in workmanship and materials and does not cover damage from accident, acts of God, neglect, contamination, misuse or abnormal conditions of operation or handling, including overvoltage failures caused by use outside of the product’s specified rating, or normal wear and tear of mechanical components.

To establish original ownership and provide date of purchase, complete and return the registration card or register the product on-line at **www.metrobility.com**. If product was not purchased directly from Metrobility, please provide source, invoice number and date of purchase.

To return a defective product for warranty coverage, contact Metrobility Customer Service for a return materials authorization (RMA) number. Send the defective product postage and insurance prepaid to the address provided to you by the Metrobility Technical Support Representative. Failure to properly protect the product during shipping may void this warranty. The Metrobility RMA number must be clearly on the outside of the carton to ensure its acceptance.

Metrobility will pay return transportation for product repaired or replaced in-warranty. Before making any repair not covered by the warranty, Metrobility will estimate cost and obtain authorization, then invoice for repair and return transportation. Metrobility reserves the right to charge for all testing and shipping costs incurred, if test results determine that the unit is without defect.

This warranty constitutes the buyer’s sole remedy. No other warranties, such as fitness for a particular purpose, are expressed or implied. Under no circumstances will Metrobility be liable for any damages incurred by the use of this product including, but not limited to, lost profits, lost savings, and incidental or consequential damages arising from the use of, or inability to use, this product. Authorized resellers are not authorized to extend any other warranty on Metrobility’s behalf.



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