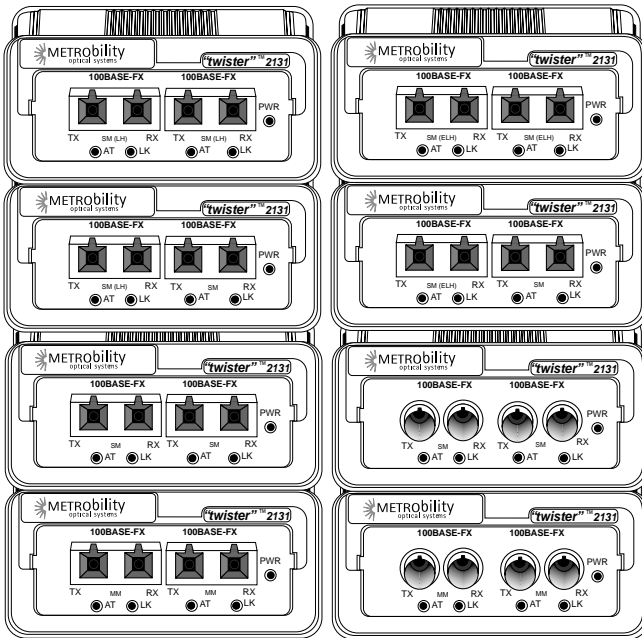METRObility
optical systems

"twister"™ 2131
Optical Extender

Installation & User Guide

Models: 2131-33-01 / 2131-44-01 / 2131-47-01 / 2131-4J-01 /
2131-55-01 / 2131-66-01 / 2131-77-01 / 2131-JJ-01

Metrobility "twister" Optical Extenders

"twister" Standalone Units:

2131-33-01 __ 100Base-FX multimode SC to 100Base-FX multimode SC
2131-44-01 __ 100Base-FX singlemode SC to 100Base-FX singlemode SC
2131-47-01 __ 100Base-FX singlemode SC to 100Base-FX singlemode SC (40km)
2131-4J-01 __ 100Base-FX singlemode SC to 100Base-FX singlemode SC (100km)
2131-55-01 __ 100Base-FX multimode ST to 100Base-FX multimode ST
2131-66-01 __ 100Base-FX singlemode ST to 100Base-FX singlemode ST
2131-77-01 __ 100Base-FX singlemode SC (40km) to 100Base-FX singlemode SC (40km)
2131-JJ-01 __ 100Base-FX singlemode SC (100km) to 100Base-FX singlemode SC (100km)

Intelligent "twister" Modules:

7131-33-75 __ 100Base-FX multimode SC to 100Base-FX multimode SC
7131-44-75 __ 100Base-FX singlemode SC to 100Base-FX singlemode SC
7131-47-75 __ 100Base-FX singlemode SC to 100Base-FX singlemode SC (40km)
7131-4J-75 __ 100Base-FX singlemode SC to 100Base-FX singlemode SC (100km)
7131-55-75 __ 100Base-FX multimode ST to 100Base-FX multimode ST
7131-66-75 __ 100Base-FX singlemode ST to 100Base-FX singlemode ST
7131-77-75 __ 100Base-FX singlemode SC (40km) to 100Base-FX singlemode SC (40km)
7131-JJ-75 __ 100Base-FX singlemode SC (100km) to 100Base-FX singlemode SC (100km)

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"twister" 2131 Optical Extender Installation & User Guide

Introduction

Thank you for choosing the Metrobility "twister" optical extender.

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

All Metrobility optical extenders are IEEE 802.3u compliant and 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" optical extender.

Overview

The Metrobility "twister" optical extender allows you to increase your network reach without the need for repeaters. The 2131 supports remote segments up to 2km over multimode and up to 100km over singlemode fiber optic cables. Maximize your Fast Ethernet segments with the 2131 and seamlessly transmit all signal activity in multimode-to-multimode or singlemode-to-singlemode configurations.

The "twister" optical extenders are available as standalone units and as modules for the Lancast® Intelligent 7500 chassis.

Metrobility optical extenders provide the following key features:
- Reliable data transmission at 100Mbps.

- Link Loss Carry Forward (LLCF) functionality to aid in troubleshooting a remote network connection. Refer to the section of this guide titled "Link Loss Carry Forward" for more information.

- Low bit delay to ensure accurate data flow across the network.

- Strict standards compliance that provides compatibility with other vendors' equipment for flexible connectivity.

For updating or expanding an existing network, Metrobility offers "twister" optical extenders that support the following fiber optic combinations:

100Base-FX multimode SC to 100Base-FX multimode SC
100Base-FX singlemode SC to 100Base-FX singlemode SC
100Base-FX multimode ST to 100Base-FX multimode ST
100Base-FX singlemode ST to 100Base-FX singlemode ST

Installation Guide

Follow the simple steps outlined in this section to install and start using your Metrobility "twister" optical extender.

1   *Unpack the "twister" and Accessories*

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

- "twister" optical extender
- 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" optical extender 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 unit 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 Geräten mit Steckanschluß muß die Steckdose nahe dem Gerät angebracht und leicht zugänglich sein.*

3 Set the LLCF Switch

The "twister" optical extender incorporates Link Loss Carry Forward (LLCF) functionality as an aid in troubleshooting a remote connection.

The switch for enabling/disabling LLCF is located on the rear panel of the unit. When LLCF is enabled, the ports on the "twister" 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 LLCF disabled (OFF).

- To enable LLCF, slide the switch to the ON position.
- To disable LLCF, slide the switch to the OFF position.

LLCF Switch
(default is OFF)

LLCF

OFF   ON

PWR

DC INPUT/5VDC
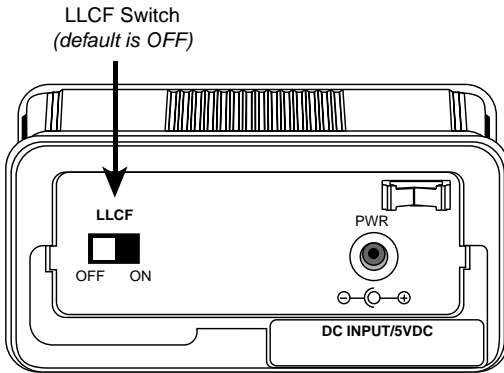
4 Connect to the Network

The Metrobility "twister" optical extender offers the ease of plug-and-play installation. To connect the "twister" to the network, plug the fiber optic cables into the appropriate connectors.

Both multimode (MM) ports on the 2131-33 and 2131-55 support a maximum segment length of 2km for remote links.

The singlemode (SM) ports on all other models support a maximum segment length of 15km unless marked LH or ELH. The singlemode long haul (LH) ports support a maximum segment length of 40km. The singlemode extended long haul (ELH) ports support a maximum segment length of 100km.

When making network connections, make sure that the transmit (TX) port of the "twister" connects to the receive (RX) port of the connected device. Make sure that the transmit (TX) port of the connected device connects to the receive (RX) port of the "twister" unit.

Attach your fiber optic connectors as shown below.
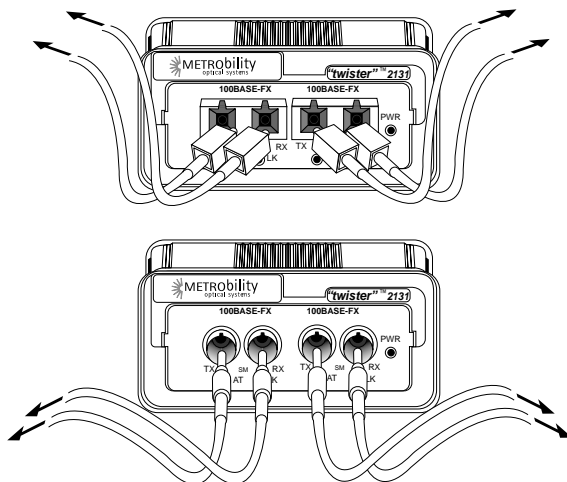
Once power is applied to the unit, correct connectivity can be verified via the link (LK) LED.

5 Apply Power

Power is provided to the "twister" unit from the desktop universal 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, connect the DC power cord to the DC input jack located on the back of the unit *__before__* making the AC connection to the outlet. Seat the power cord into the strain relief clip to prevent an accidental disconnection.

Strain Relief Clip
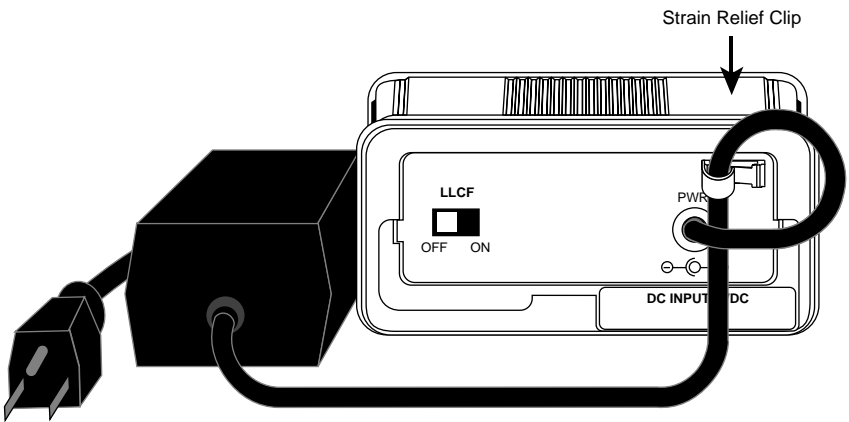
Upon receiving power, the "twister" optical extender goes into normal operation and automatically provides the appropriate signal translation between the connected network segments.

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, follow the guidelines below.

- 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" 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 No. 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 be marked HAR and have the appropriate safety approvals for the country in which the "twister" is installed.

User Guide

This section contains more detailed information regarding the operating features of the Metrobility "twister" optical extender.

System LEDs

The Metrobility "twister" optical extender provides several LEDs for the visible verification of unit status and proper functionality. These LEDs can help you in troubleshooting and with overall network diagnosis and management. There are separate activity (AT) and link (LK) indicators for each port.

When lit, the LEDs indicate the following information:

- **PWR** (power): the unit is ON and functioning normally.

- **LK** (link): satisfactory link status.

- **AT** (activity): receiving data.

Once power is applied to the unit, correct connectivity can be verified via the LK LED.
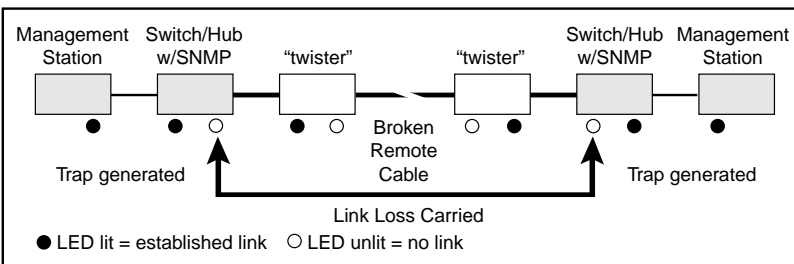
Link Loss Carry Forward (LLCF)

The "twister" optical extender incorporates LLCF functionality for troubleshooting a remote connection. The unit is shipped with the LLCF disabled (OFF).

When LLCF is enabled, the ports on the optical extender 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 (LK) LED does **_not_** illuminate. When a valid link is established at the opposite port, a complete connection is accomplished.

The diagram below shows a typical network configuration using "twister" optical extenders for remote connectivity:
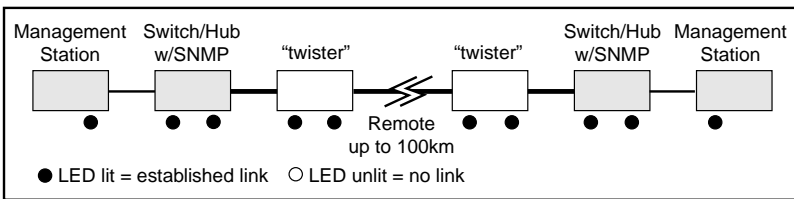
If a fiber connection breaks, or the remote device fails, the "twister" carries that link loss all the way to the switch/hub which generates a trap to the management station. The administrator can then look at the optical extender to determine the source of the loss.

Topology Solutions

Managed Long-haul Singlemode Distance Extension

Switch

Management

TX up to 100m

"twister" 2131-1J
TX to FX SM SC

singlemode FO up to 100km

Lancast® 7131-JJ-75 Module
FX SM SC to FX SM SC

singlemode FO up to 100km

"twister" 2131-1J
TX to FX SM SC

TX up to 100m

Switch
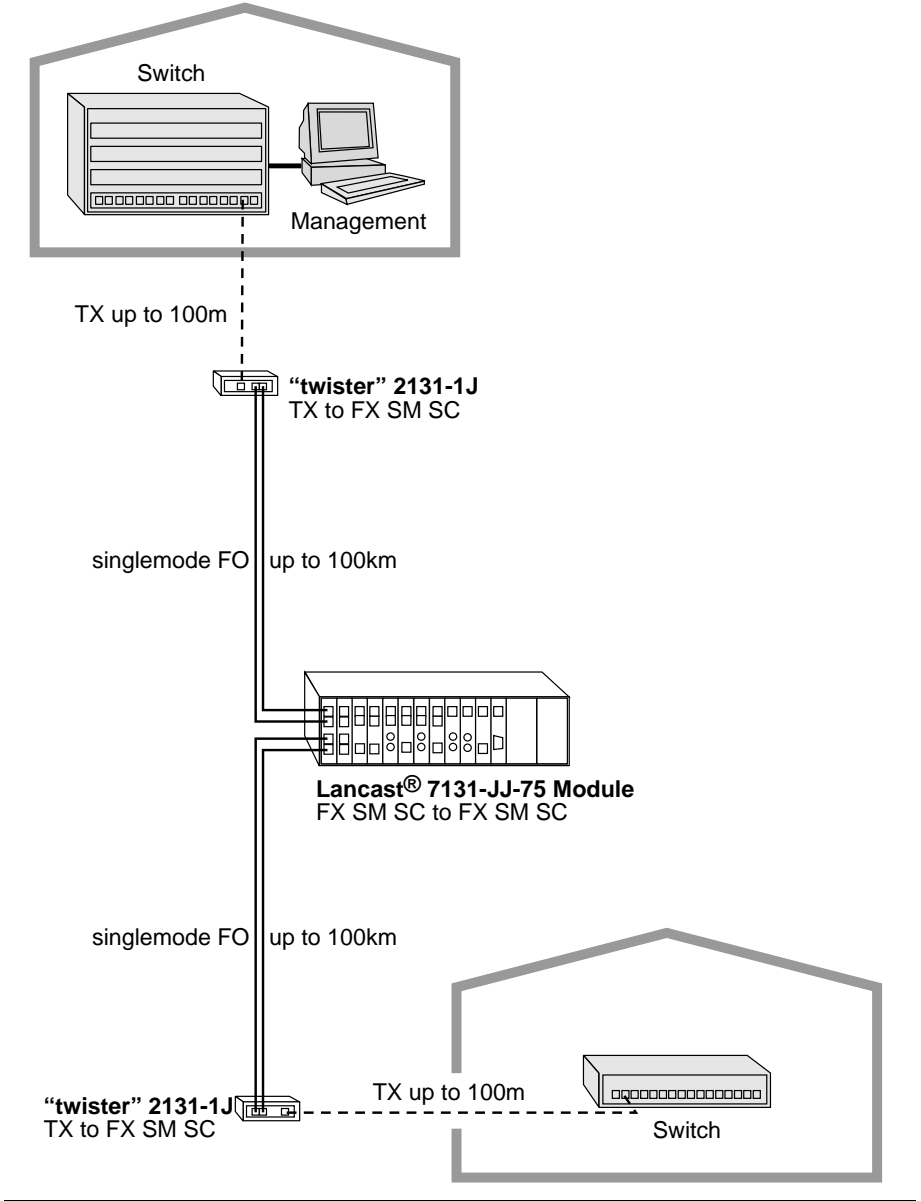
Technical Specifications

Network Connections

Multimode Fiber Optic Interface

Connector _____ ST or SC
Wavelength _____ 1310nm
RX Input Sensitivity _____ -31 dBm maximum
Output Power _____ -14 to -20 dBm (62.5/125 μm)
_____ -14 to -23.5 dBm (50/125 μm)
Supported Link Length _____ up to 2km full duplex
Cable Type _____ 50/125, 62.5/125 μm F/O

Singlemode Fiber Optic Interface

Connector _____ ST or SC
Wavelength _____ 1310nm
RX Input Sensitivity _____ -35 dBm maximum
Output Power _____ -8 dBm to -15 dBm (9/125 μm)
Supported Link Length _____ up to 15km full duplex
Cable Type _____ 8.3/125, 8.7/125, 9/125, 10/125 μm F/O

Singlemode Fiber Optic Interface — long haul distance support

Connector _____ SC
Wavelength _____ 1310nm
RX Input Sensitivity _____ -35 dBm maximum
Output Power _____ 0 dBm to -5 dBm (9/125 μm)
Supported Link Length _____ up to 40km full duplex
Cable Type _____ 8.3/125, 8.7/125, 9/125, 10/125 μm F/O

Singlemode Fiber Optic Interface — extended long haul distance support

Connector _____ SC
Wavelength _____ 1550nm
RX Input Sensitivity _____ -37 dBm minimum
Output Power _____ 0 dBm to -3 dBm (9/125 μm)
Supported Link Length _____ up to 100km full duplex
Cable Type _____ 8.3/125, 8.7/125, 9/125, 10/125 μm SM F/O

Data Rate

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

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 Réglement sur le matériel brouilleur du Canada.

Warranty and Servicing

**Three-Year Warranty for Metrobility "twister" Optical Extenders**

Metrobility Optical Systems, Inc. warrants that every "twister" optical extender 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.

METRObility
optical systems
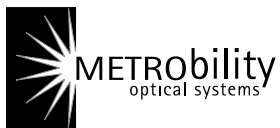
25 Manchester Street, Merrimack, NH 03054 USA
tel: 1.603.880.1833 • fax: 1.603.594.2887
www.metrobility.com