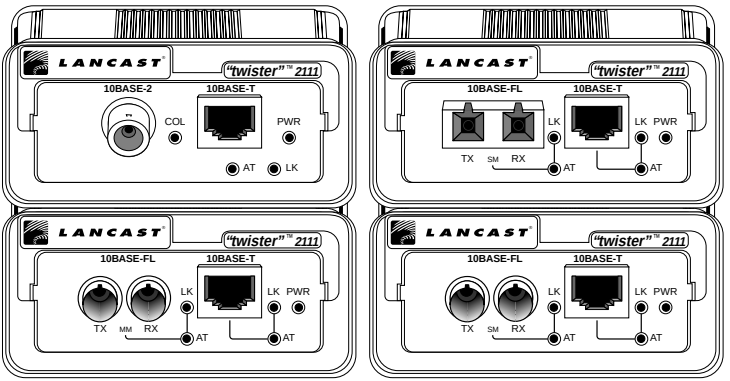
LANCAST®

"twister"™ 2111

10MBPS MEDIA CONVERTER



Installation & User Guide

Models: 2111-12-01 / 2111-12-02 / 2111-13-01 / 2111-13-02 / 2111-15-01
2111-15-02 / 2111-16-01 / 2111-16-02 / 2111-18-01 / 2111-18-02

LANCAST®

Lancast "twister"™ Media Converters

100Mbps "twister"™ Stand-alone 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

2131-34-01 ___ 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"™ Stand-alone 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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"twister" 2131 Media Converter Installation & User Guide

Introduction

Thank you for choosing Lancast "twister" media converters.

Lancast "twister" media converters represent the hottest technology available for extending Ethernet and Fast Ethernet networks. Since Lancast 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 802.3 compliant media converters are compatible with 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" 2111 media converter.

Overview

The Lancast "twister" 2111 10Mbps media converters provide seamless integration of 10BASE-T Category 3, 4 and 5 twisted-pair with singlemode and multimode 10BASE-FL fiber optic segments as well as thinnet coax in Ethernet environments.

To optimize your Ethernet network, the 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"™ 2111 provides the following key features:

- A Link Loss Carry Forward (LLCF) enable/disable switch* is included 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.

- All twisted-pair ports are equipped with an MDI-II to MDI-X switch eliminating the need for crossover cables.

- Auto polarity support on all twisted-pair ports.

Whether you are updating or expanding your existing network, the Lancast line of "twister" media converters supports a wide range of configuration needs. The "twister" 2111 includes the following media conversion combinations:

Universal Power Supply (90-250V)

2111-12-01 RJ-45 to BNC
2111-13-01 RJ-45 to FL multimode SC
2111-15-01 RJ-45 to FL multimode ST
2111-16-01 RJ-45 to FL singlemode ST
2111-18-01 RJ-45 to FL multimode SMA

Domestic Power Supply (115V):

2111-12-02 RJ-45 to BNC
2111-13-02 RJ-45 to FL multimode SC
2111-15-02 RJ-45 to FL multimode ST
2111-16-02 RJ-45 to FL singlemode ST
2111-18-02 RJ-45 to FL multimode SMA

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* *Does not apply to the "twister" 2111-12 (BNC).*

Installation Guide

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

1 *Unpack the "twister" and any accessories.*

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

- "twister" 2111 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" 2111 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 the user 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

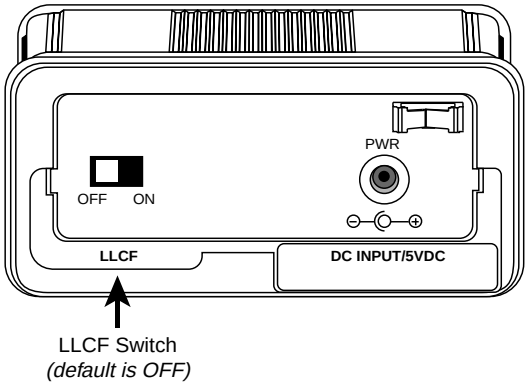
Set the Switches.

Link Loss Carry Forward (LLCF) Switch.*

The 2111 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 fiber optic ports as well as the twisted-pair 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.

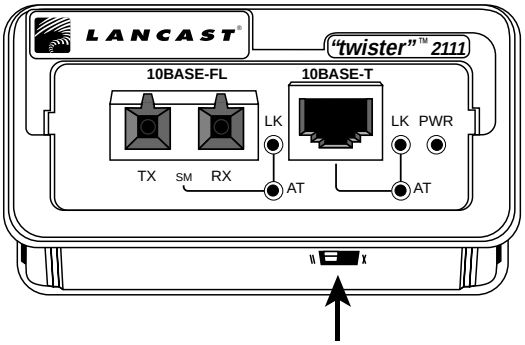
The unit is shipped with the LLCF disabled. To re-set the LLCF, simply slide the switch to the appropriate setting.



LLCF Switch
(default is OFF)

* *Does not apply to the "twister" 2111-12 (BNC).*

MDI-II to MDI-X Switch.
All "twister" media converters with twisted-pair ports have an MDI-II to MDI-X switch that eliminates the need for crossover cables. This switch is located on the bottom of the unit directly below the RJ-45 connector and allows simple setup in either straight through or crossover configurations. Refer to the illustration below.



MDI-II / MDI-X Switch

When setting the MDI-II to MDI-X switch, observe the positioning of the following symbols:

- the parallel symbol (II) indicates a straight through or parallel connection.
- the cross symbol (X) indicates a crossover connection.

These symbols are clearly marked on the bottom of the unit. Using a pointed object, simply slide the switch in the direction of the appropriate symbol. Use the following table as a guide:

A device that is wired straight through, needs one crossover connection:	
If the cable is…	… the MDI-II to MDI-X Switch Setting should be
straight through	**X**
crossover	**II**

A device that is wired crossover, needs a parallel connection:	
If the cable is…	… the MDI-II to MDI-X Switch Setting should be
straight through	**II**
crossover	**X**

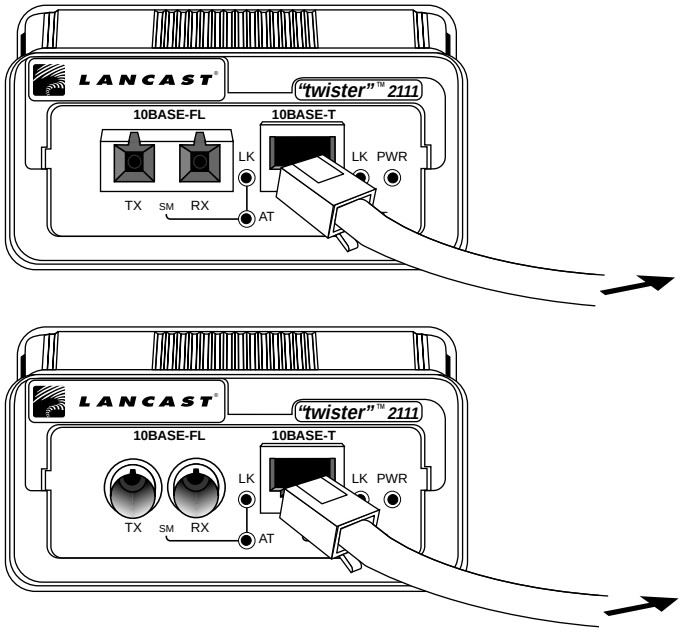
4 *Connect to the network.*

The Lancast “twister” 2111 media converter offers the ease of plug-and-play installation. Please refer to the appropriate section below for more information and guidelines regarding specific network connections.

Twisted-pair Connections *(all models).*
The “twister” 2111 provides one shielded RJ-45 connector for Category 3, 4 or 5 twisted-pair segments and supports a maximum link length of 100 meters.

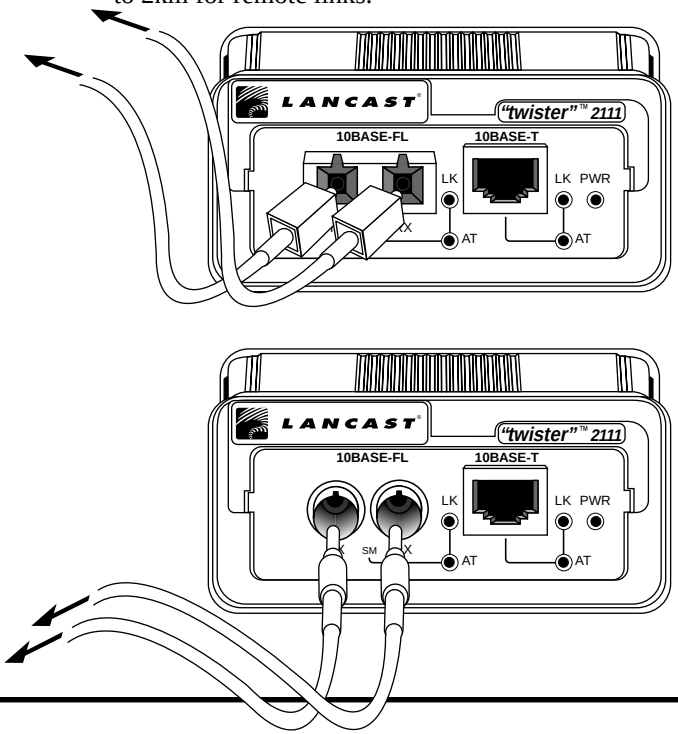
NOTE: *Be sure you have set the MDI-II to MDI-X switch located on the bottom of the unit to the proper configuration. Refer back to STEP 3 if necessary.*

Once power is applied to the unit, correct connectivity can be verified via the LK (link) LED.



Fiber Optic Connections *(2111-13, 2111-15, 2111-16, 2111-18).* These "twister" models support 10BASE-FL segments via ST, SMA or SC connectors.

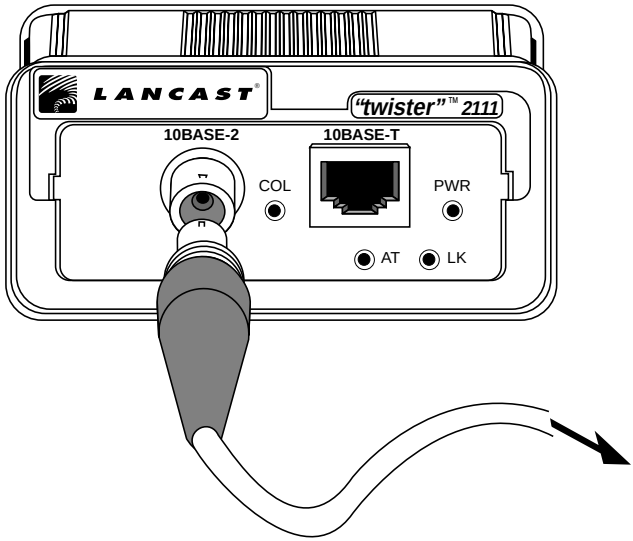
- the 2111-13-01, -02 provide one set of FL multimode SC connectors and suppport a maximum segment length of up to 2km for remote links.
- the 2111-15-01, -02 provide one set of FL multimode ST connectors and suppport a maximum segment length of up to 2km for remote links.
- the 2111-16-01, -02 provide one set of FL singlemode ST connectors and support a maximum segment length of up to 15km for remote links.
- the 2111-18-01, -02 provide one set of FL multimode SMA connectors and suppport a maximum segment length of up to 2km for remote links.



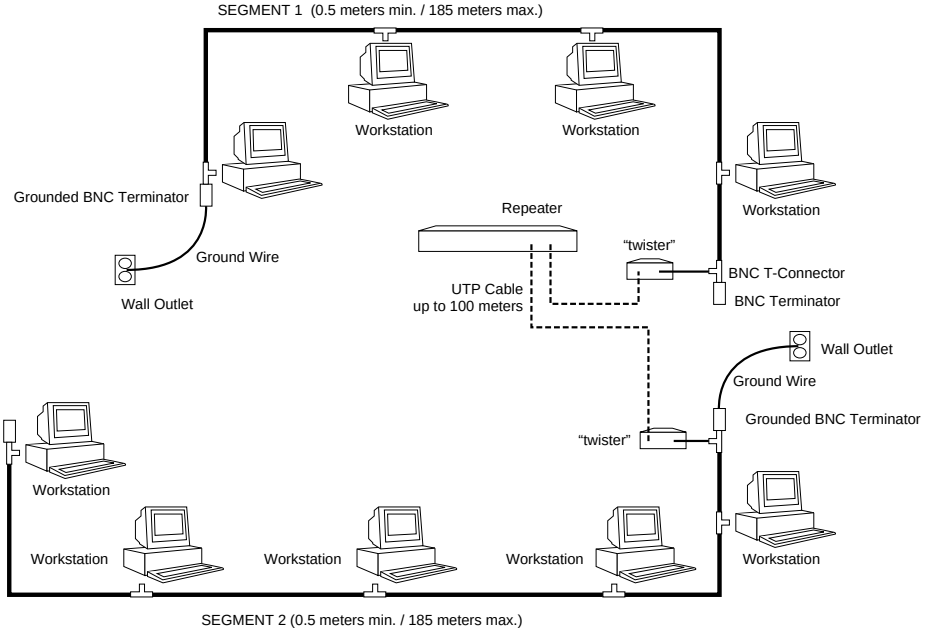
When making fiber optic connections, be sure that the transmit (TX) port of the “twister” connects to the receive (RX) port of the connected device; and be sure that the transmit (TX) port of the connected device connects to the receive (RX) port of the “twister” unit.

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

BNC Connection *(2111-12).*
The “twister” 2111-12 attaches to thinnet coaxial cable via a standard BNC connector and supports a maximum segment length of 185 meters. The “twister” 2111-12 is shipped from the factory with the termination disabled. Use the unit in a daisy-chain configuration or use a T-connector for proper termination.



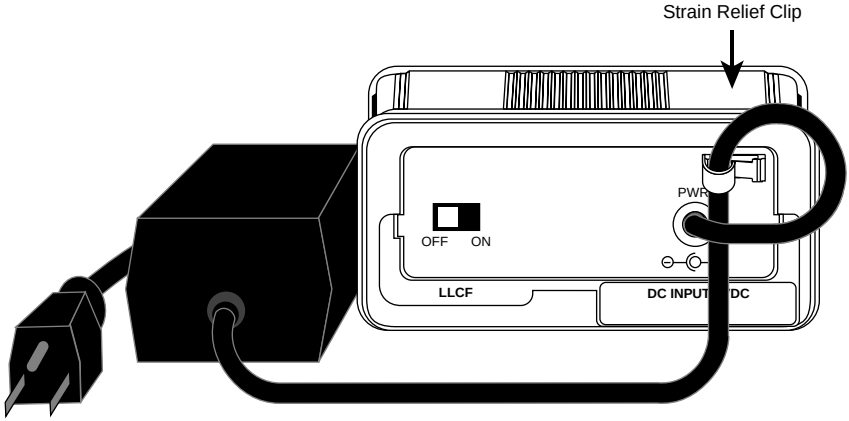
IMPORTANT: *The coaxial cable of a LAN must be properly terminated at each end regardless of the device used at the end of each cable. A BNC terminator must be attached to each end of each trunk segment. One of the two terminators on each segment must be grounded. Refer to the illustration below:*



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. Refer to page 5 for a listing of models using the 90-250V universal desktop power supply and the 115V domestic desktop power supply.

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 LK (link) 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” 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” 2111 is installed and marked HAR.

This section contains more detailed user information regarding certain operating features for your "twister" Media Converter.

System LEDs

The Lancast "twister" 2111 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; twisted-pair and fiber optic ports): satisfactory link status on the respective port.
- AT (activity): the port is receiving data.
- COL* (collision): detection of a collision condition and subsequent JAM packets generated on both segments.

Once power is applied to the unit, correct connectivity can be verified via the LK LED.

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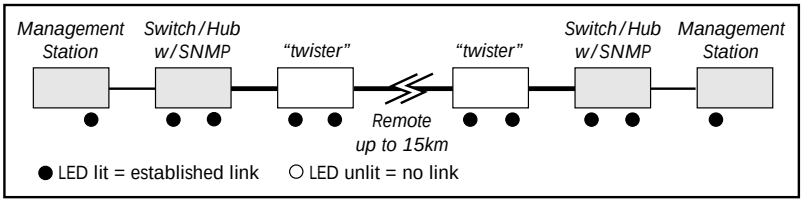
* *Applies to the "twister" 2111-12 only.*

Link Loss Carry Forward (LLCF)[*]

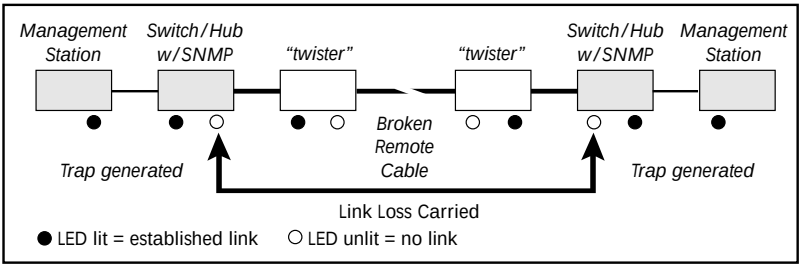
The "twister" 2111has been designed with a LLCF function for trouble-shooting a remote connection. The unit is shipped with the LLCF disabled.

When LLCF is enabled, the fiber optic ports as well as the twisted-pair ports on the 2111 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" media converters are connected via a fiber cable with nothing else connected to them, the Link LED does ***not*** illuminate. When a valid link is established at the twisted-pair port, a complete connection is accomplished.

The diagram below shows a typical network configuration using a "twister" media converter for remote connectivity:



If the fiber connection breaks, or the remote device fails, the "twister" media converter 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 media converter to determine the source of the loss.



IMPORTANT: *When connecting a "twister" media converter with LLCF enabled to an auto-negotiating device, force both sides of the configuration to either 10 or 100Mbps full or half duplex. This allows the media converter to immediately see link pulses and start passing data.*

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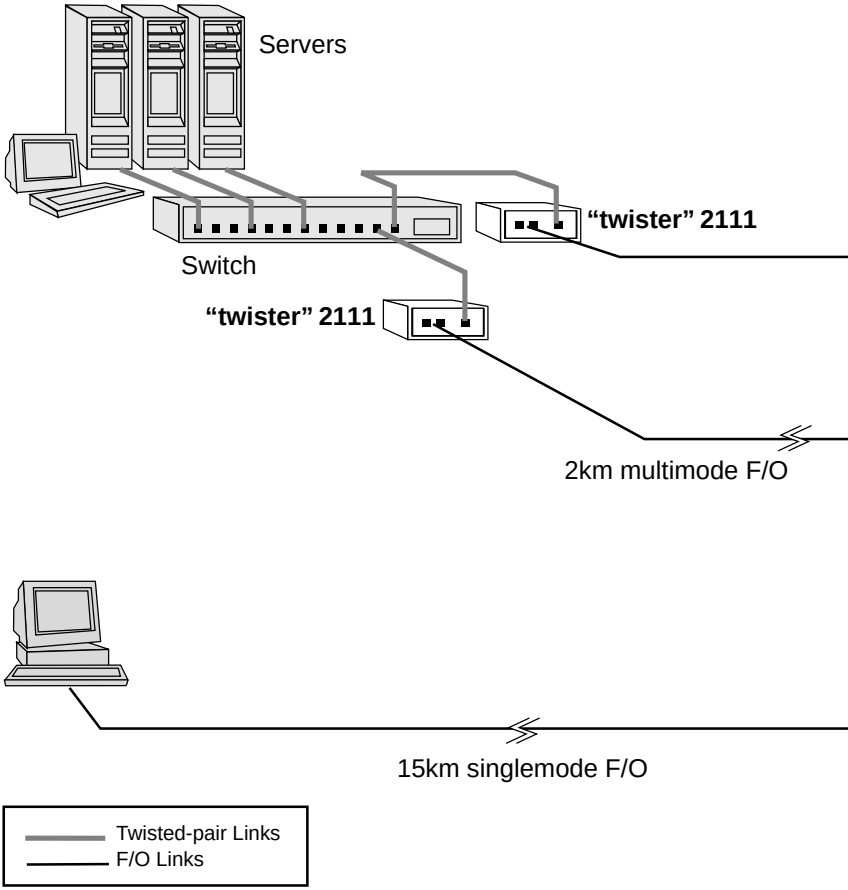
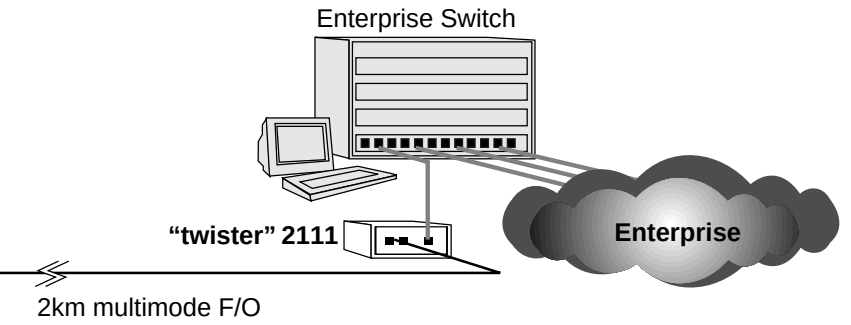
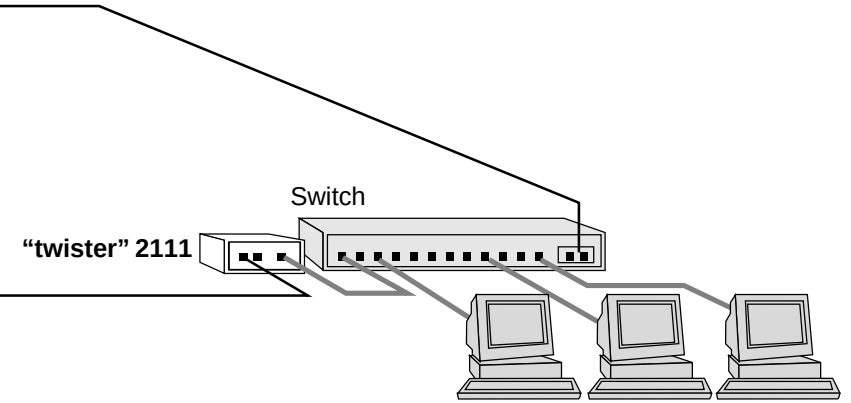
[*] *Does not apply to the "twister" 2111-12 (BNC).*


Servers
"twister" 2111
Switch
"twister" 2111
2km multimode F/O
15km singlemode F/O
Twisted-pair Links
F/O Links


Enterprise Switch
"twister" 2111
Enterprise
2km multimode F/O


Switch
"twister" 2111

Technical Specifications

Data Rate

Data Rate	10Mbps half-duplex
	20Mbps full-duplex
Bit Delay	< 5 bits

Network Connections

Twisted-Pair Interface

Connector	Shielded RJ-45, 8-pin jack
Impedence	100 Ohms nominal
Signal Level Output (differential)	2.0 to 2.8V
Signal Level Input	350mV minimum
Supported Link Length	100m
Cable Type	Category 3, 4, or 5 UTP

Multimode Fiber Optic Interface

Connector	ST, SMA or SC
RX Input Sensitivity	-32.5 dBm peak minimum
Output Power	-21.8 dBm to -16.8 dBm (50/125 µm)
	-19 dBm to -14 dBm (62.5/125 µm)
Supported Link Length	up to 2km full duplex
Cable Type	50/125, 62.5/125, 100/140 µm F/O

Singlemode Fiber Optic Interface

Connector	ST
RX Input Sensitivity	-32.5 dBm peak minimum
Output Power	-17 dBm to -23 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

Thinnet Coax Interface

Connector	BNC receptacle
Internal Transceiver	IEEE 802.3
Termination	disabled
Supported Link Length	up to 185m
Cable Type	RG-58 coaxial cable

Power

Universal

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

Domestic

Input	115V AC 60 Hz
Output	5V DC

Environmental

Operating Temperature	0° — 55° C
Storage Temperature	-25° —70° C
Relative Humidity	5% — 95% non-condensing
Physical Case	Fully enclosed metal construction
Dimensions	5.0” L x 3.5” W x 1.6” H
Weight	3 lbs (including power supply)

Regulatory

Compliance	IEEE 802.3
Safety	UL, CSA, EN60950
Emissions	FCC Part 15, Class A, EN55022 A, EN50082-1

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 802.3
- IEC 825-1 Classification
  Class 1 Laser Product

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 numerique de la classe A respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

Limited Lifetime Warranty for Lancast Media Converters

Lancast, Inc. warrants that every Lancast media converter product purchased after April 30, 1999, will be free from defects in material and workmanship for its lifetime. This warranty covers the original user only and is not transferable. Should the unit fail at any time during this warranty period, Lancast 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, please complete and return the registration card or register the product on-line at **www.lancast.com**. This warranty will not go into effect until the warranty registration has been received by Lancast.

To return a defective product for warranty coverage, contact Lancast 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 Lancast Technical Support Representative. Failure to properly protect the product during shipping may void this warranty. The Lancast RMA number must be clearly on the outside of the carton to ensure its acceptance.

Lancast will pay return transportation for product repaired or replaced in-warranty. Before making any repair not covered by the warranty, Lancast will estimate cost and obtain authorization, then invoice for repair and return transportation. Lancast 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 Lancast 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 Lancast's behalf.

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