

TM
LANMaster T8
8-Port Ethernet Hub w/SIC Slot
(E-TBT-HB-0802)

7364.A

For assistance in installing, using, or
maintaining the TRANSITION Networks
LANMaster T8 10BaseT EthernetTM Hub,
contact TRANSITION Networks
Technical Support at:

(800) 260-1312

or contact your local distributor.

Compliance Information

UL Listed

FCC Regulations

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 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 cost.

Canadian Regulations

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out on the Radio Interference Regulations of the Canadian Department of Communications.

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C. Return Procedure

Before TN item(s) can be returned, a Credit Return Authorization (CRA), Return Material Authorization (RMA), or Material Repair Authorization (MRA) number must be obtained from TRANSITION Networks (TN) or the distributor of origin.

Locate the serial number(s) of the item(s) to be returned. From the item serial number, TN or the distributor will verify the return status and provide the appropriate number to the End User. The three types of return numbers are listed below:

- A Credit Return Authorization (CRA) number can only be requested from your distributor. This CRA number will only be issued to distributors for item(s) within 90 days from the original ship date. Under no circumstances will a CRA number be issued directly to the End User. The return item(s) must be shipped freight prepaid, by the End User or the Distributor to TN.
- A Return Material Authorization (RMA) number can be requested from TN or your distributor. This RMA number is only issued for item(s) after 90 days from the original ship date but prior to the expiration of the warranty period. The return item(s) must be shipped freight prepaid, by the End User or Distributor, to the TN address below:

TRANSITION Networks Inc.
6475 City West Parkway
Eden Prairie, MN 55344 USA

TRANSITION Networks will repair or replace the unit, at its discretion, and cover the cost of the return freight to the distributor or End User who was issued the RMA number.

- A Material Repair Authorization (MRA) number can be requested from TN or your distributor. This MRA number is only issued for out-of-warranty item(s). The return item(s) must be shipped freight prepaid, by the End User, to the TN address above. The sender will be contacted by TN after the item(s) have been received, inspected, and a cost estimate of the repair has been determined. The repair charges may be billed, with approval, through your distributor or prepaid/C.O.D. basis through the End User. In either case, charges will include freight, both ways, and repair charges.

The return authorization number is only valid for 60 days from the date of issuance. Please list this number on the outside of the carton and/or packing list. Include a copy of the original invoice or packing slip to expedite processing.

D. Restocking Fee

All returns for credit must be received in the same condition as originally shipped. If TN determines that a returned product is damaged due to improper packaging or if the item is functional and returned because of customer error, inability to use, etc., TN reserves the right to charge a minimum 15% (\$10.00 minimum per item) restocking fee, the payment of which is a condition precedent to the repair and/or return of the product.

Policy And Procedure

A. Limited Warranty

TRANSITION Networks (TN) warrants, for a period of two years (with the exclusion of five years for passive balun products) from the date of shipment to the original purchaser and at the original point of installation, that products of TN's design will be free from defects in materials and workmanship and in conformity with TN's specifications. TN's sole warranty with respect to products manufactured or assembled by TN in accordance with a customer's specifications is a two year warranty that such goods conform to such specifications. These warranties do not extend to goods that have been subject to alterations, misuse, accident, tampering, improper maintenance, improper installation or abuse.

THE ABOVE WARRANTY IS EXCLUSIVE AND EXTENDS ONLY TO PRODUCTS ASSEMBLED BY TN, AND TO THE EXTENT PERMITTED BY LAW, TN DOES NOT MAKE AND DISCLAIMS ALL OTHER WARRANTIES (EXCEPT TITLE), EXPRESSED OR IMPLIED, INCLUDING BUT LIMITED TO ANY WARRANTY OF DESCRIPTION, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT AND ANY WARRANTY BASED UPON PRIOR WRITTEN OR ORAL REPRESENTATIONS REGARDING SUCH PRODUCTS MADE BY TN, ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES.

B. Limitations and Exclusions

If customer believes any goods sold hereunder are defective pursuant to the warranty and within the warranty period set forth above, the customer must notify TN within such period. TN will promptly issue a return form for such goods. Upon receipt of the form, customer is to promptly return the allegedly defective goods at customer's expense and shipped prepaid to your distributor or TN (refer to the next subsection C, Return Procedure).

No goods will be accepted for return unless a prior return form is obtained from TN, freight charges have been prepaid by customer. TN or the distributor shall, at its option, either (i) repair such goods free of charge if warranty within two years, (ii) repair such goods at a minimum of \$100 (One Hundred dollars) per item if warranty expired, (iii) replace such goods free of charge, or (iv) accept the return of such goods and credit current price therefore to the customer.

THIS IS THE EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY. IN NO EVENT SHALL TN BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER FOR BREACH OF ANY WARRANTY, FOR BREACH OR REPUDIATION OF ANY OTHER TERM OR CONDITION OF SALE, FOR NEGLIGENCE, ON THE BASIS OF STRICT LIABILITY, CONTRACT, OR OTHERWISE AND IRRESPECTIVE OF WHETHER TN IS INFORMED BY CUSTOMER OF THE POSSIBILITY OF SUCH DAMAGES IN ADVANCE OF THIS SALE.

The sole purpose of this remedy shall be to provide the customer with the replacement or repair of non-conforming goods in the manner provided here-in. This exclusive remedy shall not be deemed to have failed of its essential purpose so long as TN is willing and able to repair or replace the non-conforming goods or refund the purchase price therefore in the manner provided herein.

TN reserves the right to inspect products claimed to be defective under warranty either at the customer's location or at TN's plant. TN assumes no liability for labor charges incidental to the adjustment, service, repairing, removal or replacement of the product or other costs, or the expense of repairs made outside of its factory except when made pursuant to TN's prior written consent. All returns must be received in the same condition as the original shipment.

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POLICY AND PROCEDURE

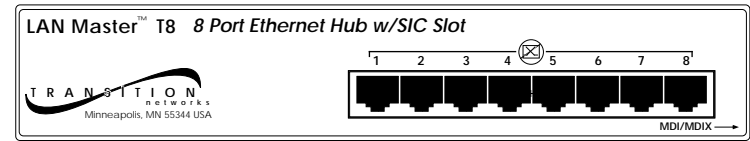
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1. INTRODUCTION

This guide is intended for the system or network administrator responsible for installing and monitoring a TRANSITION Networks LANMaster T8 8-Port Ethernet Hub w/SIC Slot. A working knowledge of local area network (LAN) operations, including familiarity with communications protocols used on interconnected LANs, is assumed.

The LANMaster T8 Hub w/SIC Slot

The LANMaster T8 8-Port Ethernet Hub w/SIC Slot (E-TBT-HB-0802), is a stand-alone, fully functional Ethernet repeater.



LANMaster T8 8-Port Ethernet Hub w/SIC Slot Features

- Media Dependent Interface (MDI) switch eliminates need for RJ-45 crossover cable connection between LANMaster T8 devices.
- Comes with internal power supply.
- Complies with Ethernet 802.3.
- Slide-In Card (SIC) slots for optional installation of additional media connections.

10BaseT Cable Specifications

The physical characteristics of the 10BaseT cable must meet or exceed IEEE 802.3 10BaseT specifications.

Either shielded or unshielded twisted pair can be used. Level 3 wire or better is recommended.

- Gauge. 26 to 22 AWG
- Attenuation Less than 11.5 dB @ 5-10 MHz
- Differential Characteristic . . 85 -110 Ω Impedance @ 10 MHz
- Maximum Distance 100 Meters (330 Feet)

Segment Distance

Media Segment Type	Maximum Number MAU/Segment	Maximum Segment Length (meters)	Minimum Medium Propagation Velocity†	Maximum Medium End to End Propagation Delay/Segment
10Base5	100	500	0.77 c	2570
10Base2	30	185	0.65 c	950
AUI ††	1 DTE/MAU	50	0.65 c	257
10BaseT	2	100 †††	0.59 c	1000
FOIRL	2	1000 ††††	0.66 c	5000
FL	2	2000	0.66 c	5000

† c = 3 x 10⁸ meters/second
†† AUI connection is not a segment
††† Maximum segment length depends on the cable characteristics
†††† A network of four repeaters and five segments, can have up to 3 coax segments and 2 required link segments. The maximum length of a FOIRL link segment must not exceed 500 meters. If your network has three repeaters and four segments, the maximum length of a FOIRL link segment must not exceed 1000 meters.

LANMaster T8 Specifications

Dimensions

9.25" X 7.75" X 1.75" (235mm x 197mm x 45mm)

Environment

Temperature: 0-50°C,
Humidity 10-90%, non condensing,
Altitude 0-10,000 feet.

Cable Specifications

10Base2 Cable Specifications

The physical characteristics of the 10Base2 cable must meet or exceed IEEE 802.3 10Base2 specifications:

- 50 Ω RG-58 Ethernet approved cable.

AUI Cable Specifications

The 15 pin AUI cable must be IEEE approved.

10BaseFL Cable Specifications

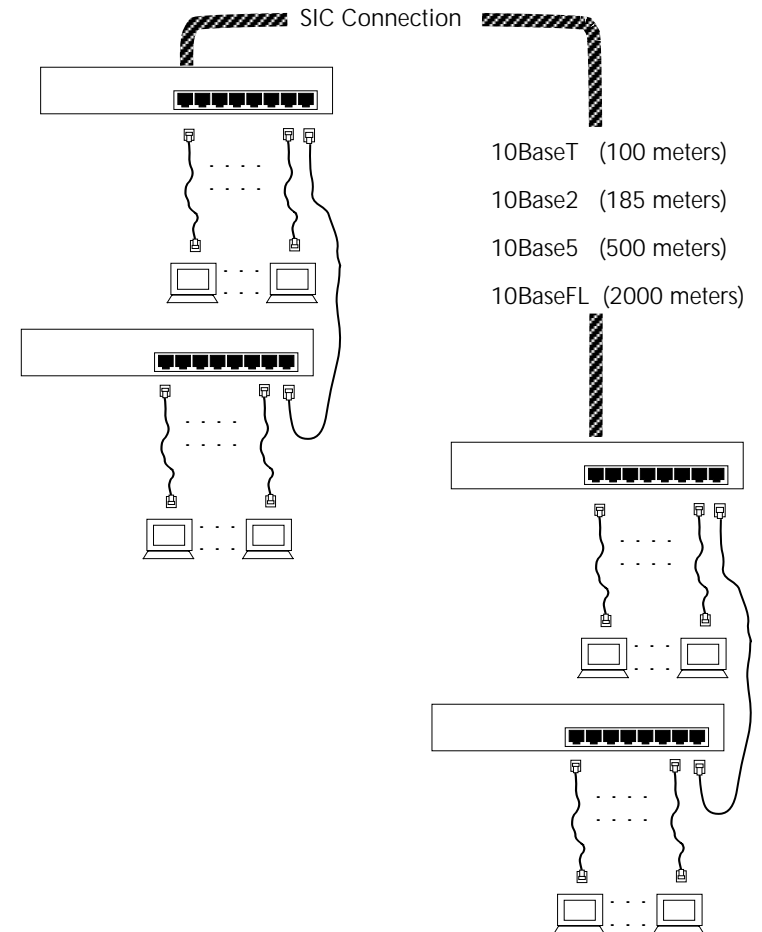
The IEEE 802.3 standard for fiber optic segments are:

- 62.5/125 μ m multimode fiber (recommended).
- 100/140 μ m multimode fiber.
- 85 μ m multimode fiber.
- 50/125 μ m multimode fiber.

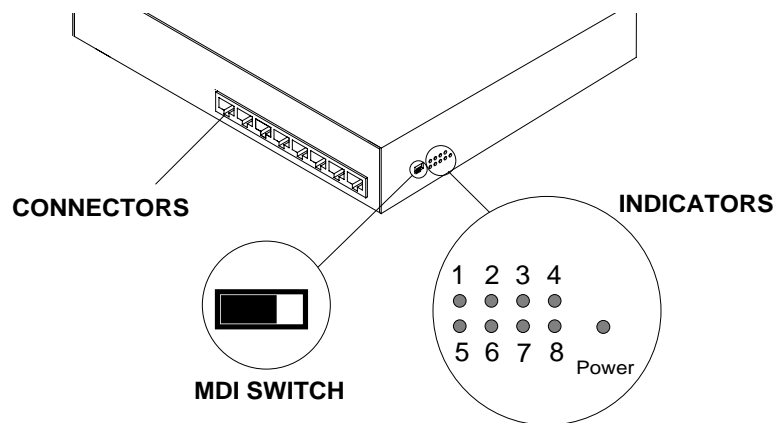
Networking the LANMaster T8 8-Port Ethernet Hub w/SIC Slot

10BaseT connections can be made to terminal equipment and to other LANMaster T8s.

Additionally, optional Slide-In cards (SICs) can be installed at the back of the LANMaster T8 to provide a connection to the network backbone.



Connectors, Indicators and Switches



Connectors

Eight (8) **RJ-45** 10BaseT connectors are located on the front of the LANMaster T8 Hub. One (1) **power** connector is located on the back of the LANMaster T8 Hub.

NOTE: Slide-In cards (SICs) can provide optional additional fiber optic, male and female AUI, BNC, and RJ-45 connectors

LEDs

The **Power** LED indicates the LANMaster T8 Hub connection to external power. The **Port Indicator Link/Partition** LEDs indicate (for each port) the status of the LANMaster T8 Hub connections to the 10BaseT network.

MDI/MDI-X Switch

The **MDI/MDI-X** switch allows the RJ-45 connection at Port 8 to be changed from **straight-through** to **crossover**.

5. MAINTENANCE

WARNING: DO NOT, UNDER ANY CIRCUMSTANCES, open and attempt to repair the LANMaster T8 8-Port Ethernet Hub w/SIC Slot or power supply adapter unit. Failure to observe this warning could result in personal injury or death from electrical shock.

NOTE: Failure to observe the above warning will immediately void the warranty.

Technical Support Contact

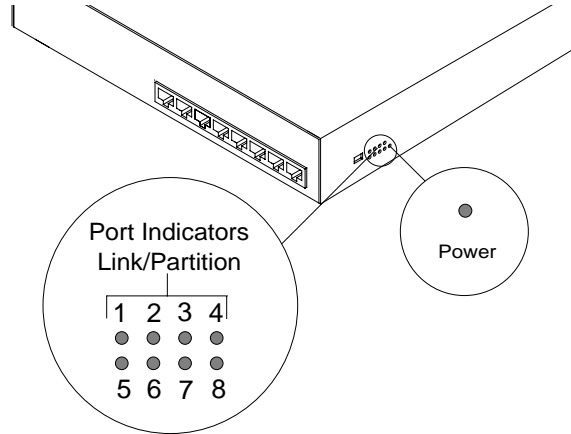
For assistance in fault isolation and in maintaining the LANMaster T8 8-Port Ethernet Hub w/SIC Slot Pocket Hub, contact:

Technical Support (800) 260-1312

or your local distributor.

4. OPERATION

The LANMaster T8 8-Port Ethernet Hub w/SIC Slot normally requires no intervention beyond occasionally monitoring the Power and Port Indicator LEDs.



Monitoring Power LED

The green **Power** LED is illuminated when the LANMaster T8 8-Port Ethernet Hub w/SIC Slot is connected to external power.

Monitoring Port/Indicator LEDs

Each of the eight twisted pair ports has an associated LED:

- **steady green** data traffic is active on link
- **flashing green** port has been partitioned.

2. SITE CONSIDERATIONS

The site for the LANMaster T8 8-Port Ethernet Hub w/SIC Slot must provide:

- AC power outlet for each LANMaster T8 8-Port Ethernet Hub w/SIC Slot
- Adequate ventilation
- Standard environmental conditions
- Isolation from electrical noise, including radio transmitters and broadband amplifiers, motors, high power electrical lines, or fluorescent light fixtures.

Additionally:

- The twisted pair cables should not run in the same conduit with power line cables.
- Phone lines should be separated from data cables.
- Flat or "silver satin" wires should not be used.
- If using Slide-in Card (SIC) connection between LANMaster T8 Hubs, the maximum cable distances are:

Fiber Optic	2000 meters
10Base5	500 meters
10Base2	185 meters
10BaseT	100 meters

And:

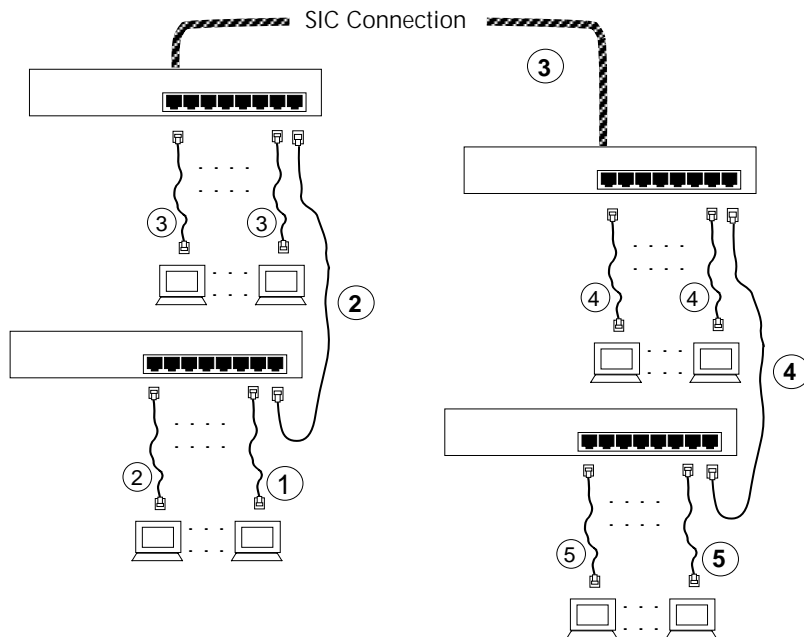
- Since the LANMaster T8 8-Port Ethernet Hub w/SIC Slot functions as an Ethernet repeater, the entire LANMaster T8 8-Port Ethernet Hub w/SIC Slot installation should comply with the IEEE Ethernet 802.3 specification.
- RJ-45 connected cables should be configured as crossover or straight through according to installation requirements.

Ensuring Compliance with 5-Segment Rule

To conform to the Ethernet 802.3 specification, when connecting LANMaster T8 Hubs, the transmission path between any two Data Terminating Equipment (DTE) devices can consist of no more than five segments. NOTE: A segment is the cable connection between cable interfaces in an Ethernet LAN.

To assign segment numbers to cable connections:

1. Determine the two terminals in the network which are separated by the greatest number of segments.
2. Assign a segment path between the terminals by labeling the cable connected to one of the terminals "segment 1" and the segment connected to the other terminal "segment n" (n = total number of segments and must be 5 or fewer).
3. To verify that no segment paths contain more than n segments, assign segment paths and numbers to all other terminals.



Powering the LANMaster T8

To power ON the LANMaster T8:

1. At LANMaster T8 back, locate the power receptacle and associated fuse.

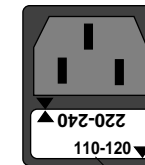
NOTE: Fuse must be installed at correct setting for power source voltage before connecting to AC outlet.

2. Verify that fuse is installed at correct setting for power source voltage.

NOTE: The installed fuse rating is indicated by the reading at lower right corner of fuse holder.

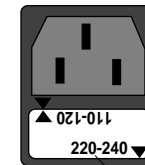
If not installed at correct setting for power source voltage:

110-120 Orientation



Fuse Holder

220-240 Orientation



Fuse Holder

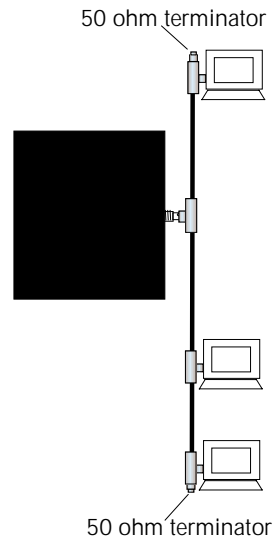
- Carefully open fuse receptacle, using a small flat blade screwdriver.
 - Rotate fuse holder 180° to the correct rating orientation.
 - Install fuse holder in correct rating orientation.
 - Close fuse receptacle.
3. Plug unit end (female) of power cord into LANMaster T8 power receptacle.
 4. Plug outlet end (male) of power cord into correct voltage AC wall socket.
 5. At LANMaster T8 front, verify that POWER LED is illuminated.

BNC Connector/10Base2 Connection

The thinnet coaxial card (E-CX-SIC) provides a BNC connector to 10Base2.

NOTE: Verify that coax cables on LANMaster T8 are terminated properly at both ends. (In a coax thinnet installation, the first and last device in a daisy-chain must be terminated with a 50 ohm terminator.)

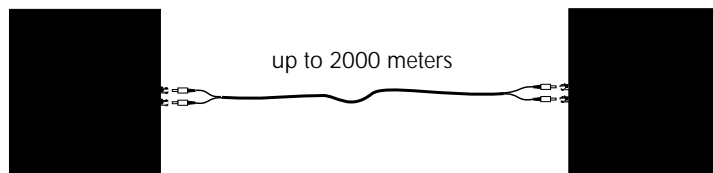
Additionally, the 10Base2 segment must be grounded to "earth ground".



Fiber Optic Connector/10BaseFL Connection

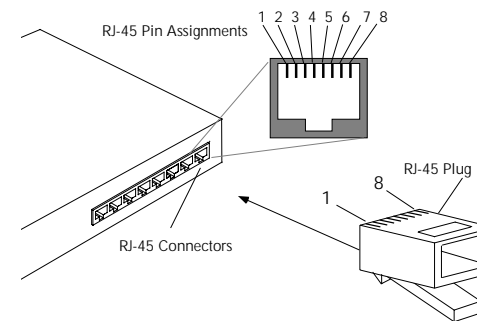
The fiber optic card (E-FRL-SIC) provides one set of transmit (TX) and receive (RX) connectors to fiber optic cable.

The redundant fiber optic card (E-FL/RED-SIC) provides a back-up fiber optic connection by providing two sets of transmit (TX) and receive (RX) connectors to fiber optic cable.



Ensuring Correct 10BaseT Configuration

The 10BaseT cable and RJ-45 connectors for **Hub to Terminal** connections must be configured as **straight through**. The 10BaseT cable and RJ-45 connectors for **Hub to Hub** connections must be configured as **crossover**. NOTE: When installing the LANMaster T8 Hub using the MDI port, a crossover cable is not needed. The MDI switch can be used to change the straight through configuration to crossover at port 8.



The two active pairs in a 10BaseT network are pins 1 & 2 and pins 3 & 6. Use only dedicated wire pairs (such as blue/white & white/blue, orange/white & white/orange) for the active pins.

Straight Through Cable at RJ-45 Plug

Hub PC, transceiver, NIC, printer

RJ-45 Male RJ-45 Male

1	.....	1
2	.....	2
3	.....	3
6	.....	6

Crossover Cable at RJ-45 Plug

Hub Hub

RJ-45 Male RJ-45 Male

1	.....	3
2	.....	6
3	.....	1
6	.....	2

3. INSTALLATION

To install the LANMaster T8 Hub:

- Unpack the LANMaster T8 Hub.
- Install on flat surface.
- Connect 10BaseT Cable at Front.
- Optionally install Slide-In Cards.
- Optionally install Slide-In Card cable.
- Connect LANMaster T8 Hub to power.

Direction is provided in the pages that follow.

Unpacking the LANMaster T8

The LANMaster T8 Hub packing contents should include the following:

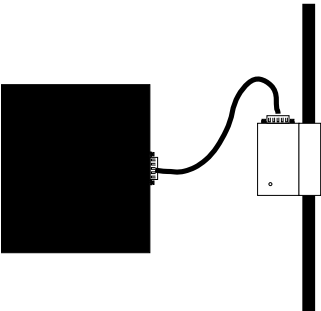
Item	Part Number
LANMaster™ T8	E-TBT-HB-0802
Power Cord	3344, 3347, 3348, 3349, or 3523, (depending upon power configuration in country where installed)
User's Guide	7364

In addition, any of the following optional SICs may be included:

Item	Part Number
Thinnet Coaxial	E-CX-SIC
Fiber Optic	E-FRL-SIC
Twisted Pair	E-TBT-SIC
Female AUI	E-AUI-DT-SIC
Male AUI	E-AUI-DC-SIC
Bridge	E-BR-SIC
Redundant Fiber Optic	E-FL/RED-SIC

Female AUI Connector/10Base5 Connection

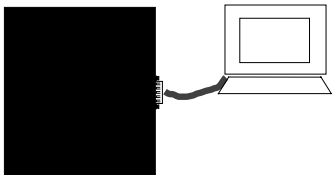
The female AUI card (E-AUI-DT-SIC) provides a female AUI connector for connection, through an AUI drop cable, to the 10Base5 port on a transceiver.



The bridge card (E-BR-SIC) also provides a female AUI connector for connection, through an AUI drop cable, to the 10Base5 port on a transceiver. NOTE: The bridge card enables site-configurable filtering of packets to and from the network backbone.

Male AUI Connector/PC Connection

The male AUI card (E-AUI-DC-SIC) provides a male AUI connector for connection, through an AUI drop cable, to a 10Base5 port on a powered PC.



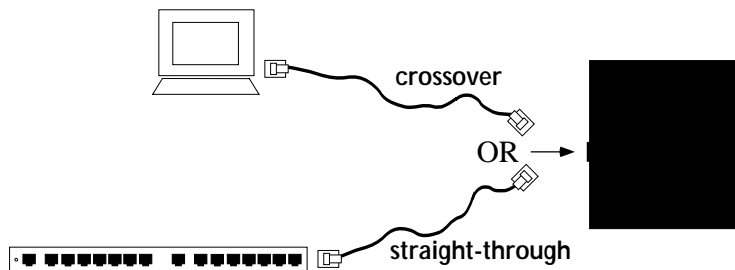
Connecting Cable to Slide-In Cards

Connections between installed LANMaster T8 SICs or between a LANMaster T8 SIC and a hub or terminal device include:

- Twisted Pair Connector/10BaseT
- Female AUI Connector/10Base5
- Male AUI Connector/PC
- BNC Connector/10Base2
- Fiber Optic Connector/Fiber Optic.

Twisted Pair Connector/10BaseT Connection

The twisted pair card (E-TBT-SIC) provides an RJ-45 connector to 10BaseT.



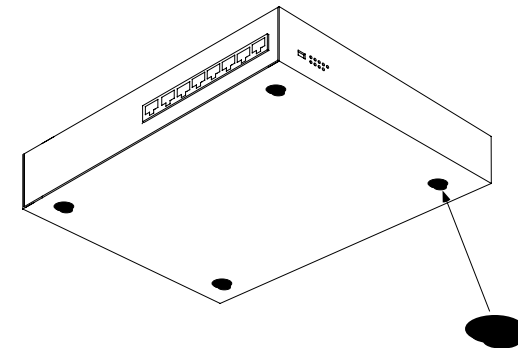
To connect 10BaseT Cable to Pocket Hub SIC RJ-45 connectors:

1. Locate or build 10BaseT cables with the following characteristics:
 - 802.3 compliant (See page 18)
 - correct (**straight through** or **crossover**) cable configuration for site installation (See page 7)
 - male RJ-45 plug connectors installed at both ends of cable.
2. Connect male RJ-45 plug connector at one end of 10BaseT cable to LANMaster T8 RJ-45 jack connector.
3. Connect male RJ-45 plug connector at other end of 10BaseT cable to DTE terminal RJ-45 jack connector (using **crossover** cable orientation) or to Hub RJ-45 jack connector (using **straight through** cable orientation).

Installing LANMaster T8 on Flat Surface

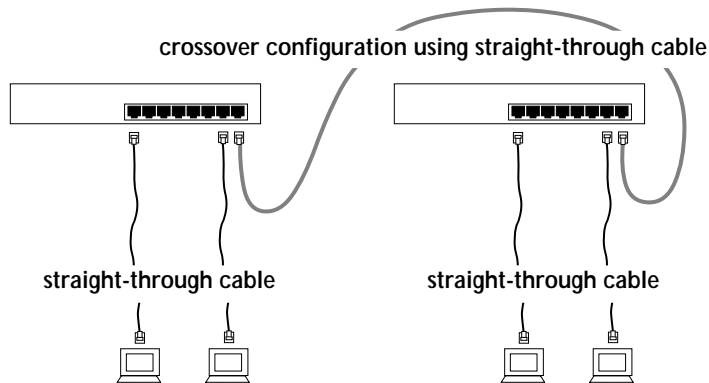
To install the LANMaster T8 on table, shelf, or other flat surface:

1. Carefully turn LANMaster T8 to side.
2. Install four (4) rubber feet:
 - Remove protective paper from adhesive surface of rubber foot.
 - Position rubber foot at bottom corner of LANMaster T8.
 - Secure rubber foot to LANMaster T8 surface.
 - Repeat for remaining rubber feet.



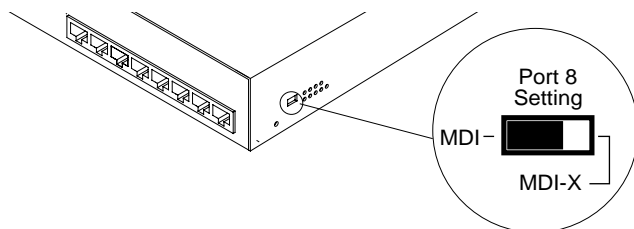
3. Return LANMaster T8 to upright position.

Connecting 10BaseT Cable at LANMaster T8 Front



To connect 10BaseT Cable to RJ-45 connectors at the LANMaster T8 front:

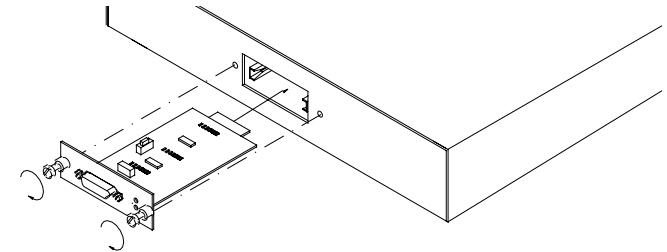
1. Locate or build 10BaseT cables with the following characteristics:
 - 802.3 compliant (See page 18)
 - straight through cable configuration (See page 6)
 - male RJ-45 plug connectors installed at both ends of cable.
2. Connect male RJ-45 plug connector at one end of 10BaseT cable to LANMaster T8 RJ-45 jack connector.
3. Connect male RJ-45 plug connector at other end of 10BaseT cable to DTE terminal RJ-45 jack connectors.
4. IF CONNECTING TWO LANMaster T8s:
 - Connect LANMaster T8s AT PORT 8, using steps 1-3.
 - Set the interface switch on one LANMaster T8 to: **MDI** and the interface switch on the other LANMaster T8 to: **MDI-X**.



Installing Slide-In Cards

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when installing Slide-In Cards. Failure to observe this caution could result in circuit board failure.

NOTE: Slide-in Cards can be hot-swapped.



To install a Slide-In Card:

1. Determine if the Slide-In Cards has an SQE switch and, if so, verify that the SQE switch is in the OFF position:

NOTE: SQE switches must be set to the following OFF positions:

• UTP/STP card	TOWARD 20-pin edge connector
• Thinnet card	TOWARD 20-pin edge connector
• AUI-DCE	AWAY FROM 20-pin edge connector
• AUI-DTE card	Not Applicable
• Fiber Optic card	TOWARD 20-pin edge connector
• Redundant Fiber Optic	SQE jumper setting on board should be labeled; if not, holding card with 20-pin edge connector at top, jumper two leftmost pins.
• Bridge	Not Applicable
2. With the Slide-In Card components facing up, carefully guide the Slide-In Card along the card guides until the Slide-In Card connector meets the the LANMaster T8 backplane.
3. Firmly push the card into the slot until the Slide-In Card faceplate is flat against the LANMaster T8 frame.
4. Rotate the Slide-In Card thumbscrews into the LANMaster T8 threaded holes.