

EtherWORKS Switch 8T/TX

Installation and Configuration

Part Number: EK-DEL8X-IN. A01

This guide describes how to install and configure the EtherWORKS Switch 8T/TX.

Revision/Update Information: This is a new guide.

October 1996

Digital Equipment Corporation makes no representations that the use of its products in the manner described in this publication will not infringe on existing or future patent rights, nor do the descriptions contained in this publication imply the granting of licenses to make, use, or sell equipment or software in accordance with the description. Possession, use, or copying of the software described in this publication is authorized only pursuant to a valid written license from Digital or an authorized sublicensor.

© Digital Equipment Corporation 1996. All rights reserved.

The following are trademarks of Digital Equipment Corporation: DEC, DECnet, Digital, UNIX, EtherWORKS, OpenVMS, PATHWORKS, ThinWire, and the DIGITAL logo.

IBM is a registered trademark of International Business Machines Corporation.

IEEE is a registered trademark of the Institute of Electrical and Electronics Engineers, Inc.

Intel is a registered trademark of Intel Corporation.

NetWare is a registered trademark of Novell, Inc.

Xerox is a registered trademark of Xerox Corporation.

All other trademarks and registered trademarks are the property of their respective holders.

FCC Class A Certification

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 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.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

VCCI Class I Compliance

この装置は、第一種情報処理装置（商工業地域において使用されるべき情報処理装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しています。

従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

This product complies with CISPR 22 Class A, UL, and is eligible to bear the CE Mark label.

Contents

Before You Start

About This Guide	vii
Package Contents	vii
Quick Installation	ix

1 Introduction

Overview of Switching Technology.....	1-1
EtherWORKS Switch 8TX	1-2
Full-Duplex Mode	1-2
Fast Ethernet.....	1-3
Switching Methods.....	1-3
Cut-Through Switching	1-3
Fragment-Free Cut-Through Switching.....	1-4
Store-and-Forward Switching	1-4
Adaptive Cut-Through Switching	1-4
Features.....	1-4

2 Hardware Description

Overview.....	2-1
Front Panel.....	2-1
Configure Button	2-2
LEDs	2-3
Power LED	2-3
Port Status Display Mode (Status)	2-3
Collision Ratio (Collision%)	2-4
Port Speed (100TX)	2-5

Transmit and Receive Status (TX/RX).....	2-5
Full-Duplex Status (Full Duplex)	2-6
Select/Link Status (Select/Link).....	2-6
Statistical Display for System Performance	2-7
Port Utilization Rate (Util%)	2-7
Port Forwarding Ratio (Forward%)	2-8
Port Filtering Ratio (Filter%)	2-8
Demonstration Display Mode (Demo)	2-8
Diagnostics Display Mode (DIAG).....	2-9
System Diagnostic Test.....	2-9
Port Diagnostic Test.....	2-10
Setting the Communication Mode (Full/Half).....	2-10
Setting Autonegotiation	2-11
Ethernet Ports	2-11
Station Ports	2-12
Daisy-Chain Port.....	2-12
Power Socket.....	2-12

3 Hardware Installation

Overview.....	3-1
Preinstallation Requirements	3-1
Hardware Installation	3-2
Stacking the DEL8X Without a Rack.....	3-2
Mounting the DEL8X in a Rack.....	3-3
Connecting the DEL8X System.....	3-3
Connecting to a PC, Server, or Workstation.....	3-3
Connecting to Another Network Device.....	3-4
Providing Power to the DEL8X	3-5
Verifying System Operation	3-6

4 Setup and Configuration

Overview.....	4-1
Diagnostic Tests	4-1
Setting the Display Mode	4-2
Port Status Display.....	4-2
Bandwidth Utilization.....	4-2
Packet Forwarding Ratio.....	4-2
Packet Filtering Ratio	4-2
Demonstration Function.....	4-2
Diagnostic Function.....	4-3

Communication Mode.....	4-3
Verifying Port Status	4-4

5 Applications

Overview.....	5-1
DEL8X Functions	5-1
Collapsed Backbone for Starter Network	5-2
Multiport Bridge with High-Bandwidth Backbone.....	5-3
High-Bandwidth File Server	5-4
High-Speed Link Between Switches	5-5

A Troubleshooting

Overview.....	A-1
Diagnosing DEL8X LEDs	A-1
System Diagnostics.....	A-2
Power and Cooling Problems	A-2
Installation	A-2
Transmission Mode.....	A-2
Cabling	A-3
External Adapters	A-3
Configuration.....	A-3
DEL8X Integrity	A-3

B General Information

Overview.....	B-1
Physical Description	B-1
Conformance	B-1
Operating Environment Specifications.....	B-2
Bridging Criteria	B-2
Acoustical Specifications.....	B-3
Safety Compliance	B-4
Connector Pin Assignments	B-5
8-Pin MJ Port	B-5
Other Digital Network Adapter Products	B-6
Ordering Information.....	B-7

C Limitations of Shared Ethernet

Single Collision Domain	C-1
Failure of Alternate Solutions.....	C-2

Glossary

Before You Start

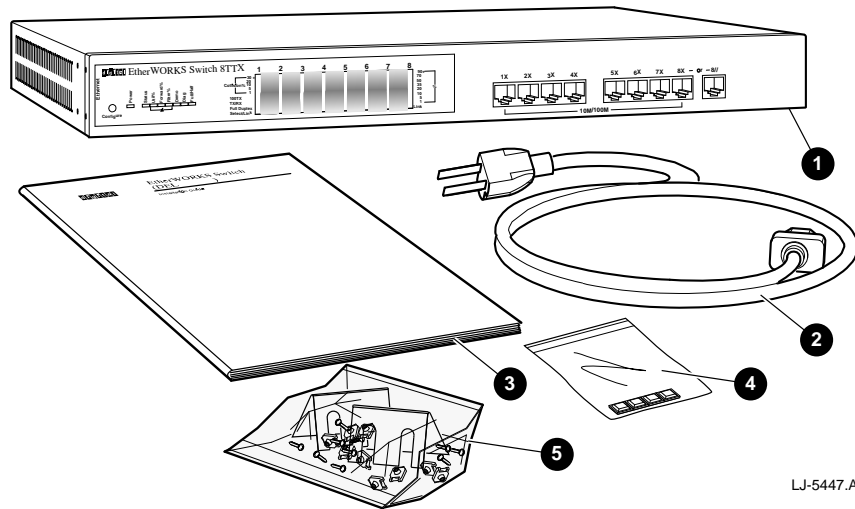
About This Guide

This guide is designed for the experienced network installer. It describes how to install and configure Digital's EtherWORKS Switch 8T/TX (also referred to as the DEL8X or switch).

Package Contents

The EtherWORKS Switch 8T/TX package contains the items in the following list and shown in the following figure.

- The EtherWORKS Switch 8T/TX ❶
- An ac power cord ❷
- This installation and configuration guide ❸
- Four rubber feet ❹
- Rackmount brackets and screws ❺



LJ-5447.A14

Quick Installation

The EtherWORKS Switch 8T/TX contains eight 8-pin MJ Ethernet ports, each of which supports 10Base-T or 100Base-TX connections. The transmission speed (10 Mb/s or 100 Mb/s) is detected by autosensing for any device attached to the hub. The transmission mode (full- and half-duplex) is set by autonegotiation if supported by the attached device; otherwise, the mode can be set manually using the Configure button. The smart design built into the front display panel and configuration options provides a friendly interface that simplifies installation and network troubleshooting.

Use the following procedure to install the DEL8X:

1. Unpack the DEL8X.
2. Choose a location close to the network device you need to connect, and within easy reach of an electrical outlet.
3. Install the DEL8X on a desktop or mount it in a rack.
4. Connect PCs, servers, or workstations to the 8-pin MJ crossover-wired (x) ports on the DEL8X. These ports use autosensing to dynamically set the transmission speed at 10 Mb/s or 100 Mb/s. The transmission mode is dynamically set to half- or full-duplex mode if the connected device supports autonegotiation (see the Full-Duplex Mode section in Chapter 1 and the Full-Duplex Status section in Chapter 2 for more information).
5. Connect to another switch or compatible hub using the straight-wired (8//) daisy-chain port on the DEL8X to a standard crossover-wired (x) port on the other device.

You may also use the DEL8X as a collapsed backbone for small networks or connect to a network interconnection device using one of the 8-pin MJ ports. (Refer to Chapter 5 for sample applications.)

6. Verify network communications by ensuring the following:
 - You have made all the necessary connections.
 - You can access any connected resources.
 - The DEL8X LEDs are functioning properly.

If you encounter any problems installing the DEL8X, refer to Chapter 3 for a detailed description of installation procedures, or to Appendix A for troubleshooting help.

Overview of Switching Technology

The Ethernet switch allows simultaneous transmission of multiple packets using an internal high-speed data channel. This means that it can partition a network more efficiently than bridges or routers in most environments. Therefore, the Ethernet switch is recognized as one of the most important building blocks for today's networking technology. See Appendix C for information about the limitations of shared Ethernet.

The learning function in the switch stores the address and corresponding port number of each incoming and outgoing packet in a routing table. This information is subsequently used to filter packets whose destination address is on the same segment as the source address. Network traffic is thereby confined to its respective domain, reducing the overall load on the network.

The switch scans the destination address from the packet header, searches the routing table provided for the incoming port, then forwards the packet only if required, often before fully received. This fast forwarding makes the switch attractive for connecting servers directly to the network, thereby increasing throughput and availability. However, the switch is most commonly used to segment existing hubs, which usually improves overall performance. A switching hub can be easily configured in any Ethernet network to significantly boost bandwidth using conventional cabling and adapters.

EtherWORKS Switch 8T/TX

The DEL8X can boost network bandwidth well beyond that of conventional shared Ethernet. For example, when running all ports at 100 Mb/s under full-duplex mode, the bandwidth increases to 1.6 Gb/s. It provides eight 8-pin MJ station ports for attachment to standard Ethernet (10Base-T) or Fast Ethernet (100Base-TX) at half- or full-duplex mode. The transmission speed for each port is automatically detected by the switch. The transmission mode can be set by the switch using autonegotiation if the attached device also supports this feature. Ports can be automatically configured to match the maximum capabilities of the attached device.

When connected to a shared collision domain (such as a repeater hub or multiple workstations), the DEL8X ports operate at half-duplex mode. However, when using a dedicated link, the DEL8X ports can be set at full-duplex mode to maximize throughput, allowing multiple conversations to take place simultaneously. This ensures high throughput, even under heavy network loading.

As a device functioning on the media access control (MAC) layer, the DEL8X is protocol independent, and therefore compatible with IEEE 802.3, IEEE 802.3u, TCP/IP, NetWare, DECnet, and XNS protocols. The DEL8X can be configured as a standalone device to form a work group consisting of two to eight subnetworks or workstations, it can function as a collapsed backbone for a local area network (LAN), or it can serve as a multiport bridge. With its low port-to-port latency and extremely high-forwarding efficiency, the DEL8X can also be connected to other switches or compatible hubs. Moreover, where traditional 100Base-TX networks based on repeater technology restrict the maximum distance between end nodes to 205 meters, the DEL8X divides your network into smaller and more manageable segments, each linked to the larger network with a switch. This enables unlimited maximum distance for communications between end nodes.

Full-Duplex Mode

When performance bottlenecks are caused by congestion at the network access point (such as the network adapter for a high-volume file server), it may be necessary to segment the network down to a point where a single node is attached to a switch port thereby forming a dedicated segment. For dedicated links, using full-duplex mode can immediately double network throughput.

Full-duplex mode uses two independent data paths for simultaneous transmission in both directions. These independent, parallel full-duplex paths are extended throughout the entire switching fabric, which allows connections to be made from both halves of a full-duplex connection to two separate half-duplex ports. In addition to autosensing the transmission speed of the connected device (at 10 Mb/s or 100 Mb/s), the DEL8X can autonegotiate its transmission mode at half- or full-duplex mode if the connected device also supports this function. (See the Communication Mode section in Chapter 4 for more information.)

Fast Ethernet

The DEL8X provides a simple cost-effective method to integrate existing networks with Fast Ethernet. This switch provides an ideal front-end interface for small to medium networks. By offering 100 Mb/s full-duplex connections to high-utilization devices such as departmental servers and high-performance workstations, the DEL8X relieves the performance bottleneck found on most client-server applications, where many client stations compete to retrieve data from a few servers.

To install the DEL8X, use your current network infrastructure, including wiring and network interface cards (NICs). Afterwards, you can configure and monitor the system using the DEL8X front panel, which includes an extensive array of LEDs for monitoring the unit's overall condition, as well as the status of each port.

Switching Methods

The DEL8X can simultaneously forward frames among up to eight different shared or dedicated Ethernet segments. With extensive buffering, it can support connections between any segment pair, whether 10 Mb/s or 100 Mb/s at half- or full-duplex mode. The fully parallel internal design allows the DEL8X to easily maintain media speed frame transfer between multiple port pairs.

The switching methods used by the DEL8X are described in the following sections.

Cut-Through Switching

The DEL8X performs “on-the-fly” cut-through switching, which sends a packet to the other port according to the destination address scanned from the packet header. This technique reduces the latency of packet transmission to 20 microseconds or less. Compared to approximately 800 microseconds for a bridge or 1800 microseconds for a router, both of which have to store the entire packet before it can be forwarded, the DEL8X can deliver a quantum improvement to network performance.

Fragment-Free Cut-Through Switching

This method of switching is a more conservative approach to cut-through switching by waiting until the collision window has elapsed (that is, the first full 64 bytes have been received) before processing the packet. This guarantees that the collision window for the incoming frame has elapsed and that the frame will not be jammed by other stations. When there are many stations on a segment, this method can significantly improve the utilization of network bandwidth.

Store-and-Forward Switching

Traditional bridges and routers use a safe mode of switching called store-and-forward in which the entire frame must be received before the bridge can perform a table lookup for the destination node and forward the packet to the corresponding port. As a result, each packet is delayed by approximately 800 microseconds. It may be necessary to use this method of switching when many data errors are occurring over the network, or when connecting to very slow devices.

Adaptive Cut-Through Switching

To ensure that you can manage any kind of network load, the DEL8X uses this method of switching based on its smart algorithm. Adaptive cut-through switching dynamically changes the way it handles data passing through the DEL8X based on the current CRC error rate. These switching alternatives start with standard cut-through switching for a clean data environment, change to fragment-free cut-through switching for a moderate error rate, then progress to store-and-forward switching for a highly contentious environment. By using this method, the DEL8X delivers the best networking performance under any environment.

Features

The main features of the DEL8X are as follows:

- Eight independent 8-pin MJ 10 Mb/s or 100 Mb/s Ethernet ports
- Port 8 consists of one crossover-wired (x) port for connecting to PCs, workstations, servers, bridges, and routers or one straight-wired port (/) for a cascaded connection to another switch or compatible hub, thereby eliminating the need for crossover cables
- Autosenses transmission speed (10/100 Mb/s)
- Autonegotiates transmission mode (half- or full-duplex) if supported by the attached device
- Supports both full-duplex and half-duplex operation for all ports
- Total bandwidth of up to 1.6 Gb/s

- Uses “on the fly” cut-through switching technique to transport packets
- Minimum latency of packet transmission (leading edge to leading edge) of less than 20 microseconds when using cut-through switching
- Supports transparent bridging function
- Provides a 256 KB buffer for each port
- Routing table contains 4K entries per port to store MAC address for attached network nodes
- Automatically learns MAC addresses to build the routing information database
- Uses a fast hashing scheme to retrieve information from the routing table when making routing decisions
- Provides frame filtering and forwarding functions for each port, which are capable of filtering and forwarding Ethernet packets at line speed
- Nonblocking crossbar switching matrix allows concurrent operation of up to eight Ethernet segments
- Uses back pressure to eliminate frame loss by blocking traffic from end stations or segments connected directly to the DEL8X when its buffers fill
- A LED indicator panel for monitoring the overall condition of the DEL8X, including utilization rate and collision
- Port network status equalizer display
- Conforms to the IEEE 802.3 and IEEE 802.3u specifications (10Base-T and 100Base-TX standards)
- Basic configuration can be performed using the Configure button (plug and play)
- Automatic polarity detection and correction permits automatic adjustment for wiring errors
- Transparent to all higher level protocols
- Provides self-diagnostics
- Flexible installation for the desktop or rackmount

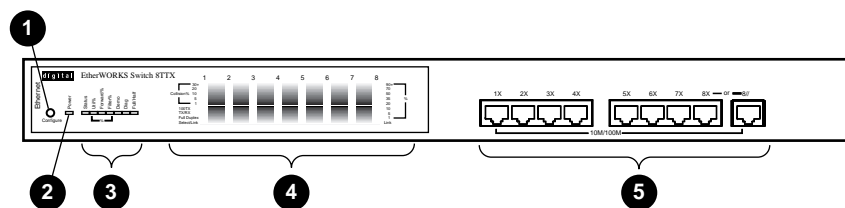
Hardware Description

Overview

This chapter describes the hardware features of the EtherWORKS Switch 8T/TX. For easier management of the switch, familiarize yourself with the front panel display LEDs, Configure button, and ports shown in the following illustrations and described in the following sections.

Front Panel

The front panel on the DEL8X (shown in the following figure) provides a simple interface for configuring or monitoring network connections. It includes a Configure button **1**, power LED **2**, display mode LEDs **3**, statistical display mode LEDs **4**, and eight station ports **5**.



LJ-5449.A14

Configure Button

The Configure button, located on the left of the front panel (❶ in the previous and next figures), is used to select the following configuration functions:

- Port status (displays the status of ports during normal operation)
- System performance (displays the relative bandwidth utilization rate, forwarding ratio, or filtering ratio for each port)
- Demonstration (verifies that all LEDs are functioning properly)
- Diagnostics (tests the status of various system components)
- Full- and half-duplex mode (sets port communication to full-duplex or half-duplex operation)

To set system performance or diagnostic mode, use the following procedures:

Note

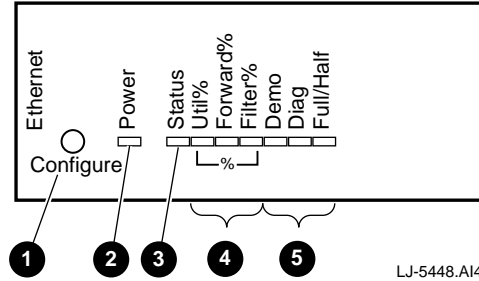
The term “long press” means to press the Configure button for more than 2 seconds, then release it. The term “short press” means to press the Configure button, then immediately release it. If the Configure button is not pressed within 10 seconds, the system returns to normal operation.

1. **To start the configuration**, use a long press on the Configure button. The LEDs will light to show the selected configuration function. (Refer to the related sections in this chapter and in Chapter 4 for complete details.)
2. **To scan through the configuration functions**, use a short press on the Configure button. (Refer to the Communication Mode section in Chapter 4 for information on how to select full- and half-duplex communications.)
3. **To accept and implement the current settings**, use a long press on the Configure button.

LEDs

The LEDs shown in the following figure indicate:

- The unit is receiving power ❷
- The current display mode ❸
- The statistical display for system performance ❹
- The demonstration, diagnostics, and full- and half-duplex display modes ❺



Power LED

The power LED indicates the conditions described in the following table:

LED Activity	Condition	Indication
Blinking light	ON	Unit is receiving power
No light	OFF	Power is disconnected, no power received

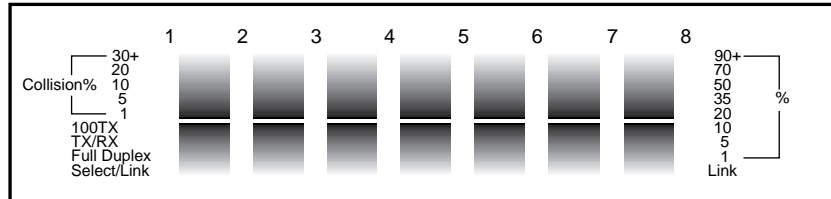
Port Status Display Mode (Status)

The port status display LED (❸ in the previous figure) shows the port status for the DEL8X.

When this LED lights (see the following table), the port status display LEDs (shown in the next figure) provide the information described in the following sections.

Hardware Description

LED Activity	Condition	Indication
Steady light	ON	Port status display mode is active
No light	OFF	Port status display mode is inactive



LJ-5450.A14

Collision Ratio (Collision%)

For half-duplex transmission, collisions occur when two or more devices connected to a DEL8X attempt to transmit data simultaneously on the network. When a collision occurs, the devices pause, then retransmit after a pseudo-random wait period. Because wait periods differ among devices, successive collisions become increasingly improbable. For full-duplex transmissions, no collisions occur because the port serves as a dedicated link for the attached device.

The collision LEDs assist the network manager in monitoring the percentage of packet collisions occurring relative to the total packets transmitted by each port. The collision LEDs are labeled by row to indicate the percentage of collisions encountered by the corresponding port. When collisions reach a level marked on the LED display, the corresponding LED lights. For example, if packet collision reaches 1%, the LED labeled 1% will light. However, if collisions go beyond 30%, the LED labeled 30% and all the other LEDs before it (1, 5, 10, and 20) also light in rapid succession (see the previous figure and the following table).

Label%	Color
30%	Red
20%	Amber
10%	Amber
5%	Green
1%	Green

Note

If any port displays a high collision rate, check to see if any of the connected devices are malfunctioning or if a loop has been formed in your network connections. Otherwise, you may need to reconfigure your network to balance the traffic load.

Port Speed (100TX)

All DEL8X ports can operate at either 10 Mb/s or 100 Mb/s. Network access speed is automatically sensed by the system and displayed by this LED (see the following table):

LED Activity	Condition	Indication
No light	OFF	Port is set at 10 Mb/s
Steady light	ON	Port is set at 100 Mb/s

Note

The DEL8X can detect transmission speed even if the attached device does not support autonegotiation.

Transmit and Receive Status (TX/RX)

The following table describes the transmit and receive status LEDs when traffic is traversing the port:

LED Activity	Condition	Indication
Blinking light	ON	Port is transmitting or receiving packets; frequency of blinking is proportional to the traffic passing through the port
No light	OFF	No packets are traversing this port

Full-Duplex Status (Full Duplex)

The following table describes the full-duplex status LEDs when communications have been set to this mode for the indicated port:

LED Activity	Condition	Indication
Steady light	ON	Port is set for full-duplex operation
No light	OFF	Port is set for half-duplex operation

Select/Link Status (Select/Link)

The following table describes the Select/Link status LEDs during a valid network connection associated with the port:

LED Activity	Condition	Indication
Steady light	ON	Valid link has been established on this port
No light	OFF	No valid link has been established on this port

Note

If the Select/Link LED does not light when a device is connected to its corresponding port, make sure that both the DEL8X and the connected device are powered on. Verify that the cable length (standard, straight-through cable) does not exceed 100 meters. Use crossover cables only if no crossover-wired (x) port is available to cascade switches.

Statistical Display for System Performance

The statistical display LEDs (shown in the previous figure) indicate a functional value for each port, depending on the selected display mode (Util%, Forward%, and Filter%). (Refer to the previous Configure Button section in this chapter for information on setting the display mode.) These LEDs are described in the following table and sections:

Label (%)	Color
90+%	Red
70%	Amber
50%	Amber
35%	Green
20%	Green
10%	Green
5%	Green
1%	Green

Port Utilization Rate (Util%)

When this function is enabled, the statistical display shows the percentage of valid data transmitted over the complete network bandwidth (updated every 0.5 seconds). Eight LEDs represent the percentage of network utilization. The corresponding LEDs light to show that the utilization of LAN bandwidth has reached this percentage (see the following table). When active, these LEDs function similarly to a stereo system's equalizer display.

For example, if network utilization reaches 1%, the LED labeled 1% will light. However, if network utilization rises above 1% (for example, 35%), the LED labeled 35% and all the other LEDs before it (1, 5, 10, and 20) will also light in rapid succession. These LEDs monitor the share of valid network frames handled by each port within a 10 Mb/s or 100 Mb/s bandwidth, depending on the port. The LEDs provide a quick way to monitor the current traffic load relative to the network's capacity.

LED Activity	Condition	Indication
Steady light	ON	Port utilization display mode is active
No light	OFF	Port utilization display mode is inactive

Port Forwarding Ratio (Forward%)

When this function is enabled, the statistical display shows the percentage of packets that must be forwarded by bridging hardware to the other port on the DEL8X, that is, another LAN segment or connected workstation. When viewing these LEDs, remember that under normal conditions, the DEL8X forwards all Ethernet packets that must be transferred among the connected LAN segments at full line speed.

LED Activity	Condition	Indication
Steady light	ON	Port forward display mode is active
No light	OFF	Port forward display mode is inactive

Port Filtering Ratio (Filter%)

When this function is enabled, the statistical display shows the percentage of packets that must be filtered from the DEL8X by bridging hardware because the destination address is on the same segment connected to the receiving port. When viewing these LEDs, remember that under normal conditions, the DEL8X filters all Ethernet packets that belong to the local LAN segments at full line speed. This means that no local traffic leaks through to the other segments.

LED Activity	Condition	Indication
Steady light	ON	Port filtering display mode is active
No light	OFF	Port filtering display mode is inactive

Demonstration Display Mode (Demo)

When this function is enabled, the system cycles through all the DEL8X LEDs to verify that the LEDs are functioning. The LEDs will continue to light until the function is disabled.

LED Activity	Condition	Indication
Steady light	ON	Demonstration function is enabled
No light	OFF	Demonstration function is inactive

Diagnostics Display Mode (DIAG)

When this function is enabled, the diagnostic display mode indicates that the system is in diagnostic mode. (Refer to the previous Configure Button section in this chapter for information on setting the display mode.)

After powerup, the DEL8X automatically performs a self–diagnostic test. This test is done in two stages: the first stage is the system diagnostic test; the second stage is the port diagnostic test. If a problem is detected, the current diagnostic process (system or port test) will continue until completed. If the test does not complete successfully, the corresponding LEDs (described in the following table and sections) will flash after test completion to indicate which component failed the test.

Note

Enabling the Diagnostic function activates tests similar to the one performed upon powerup. After successfully completing diagnostics, the system returns to normal operation.

System Diagnostic Test

The following table describes the system–level failures and corresponding LEDs. If a problem is detected, failure indications will appear in row 9.

LED (Column, Row)	Color	Component Tested
1, 9	Red	System ROM
2, 9	Red	System RAM
3, 9	Red	System EEPROM

Port Diagnostic Test

The port diagnostic test checks all ports. If a problem is detected, the LEDs in the corresponding column (indicating the malfunctioning port) and rows (indicating the failed component) will light as shown in the following table:

LED (Row)	Color	Diagnostic Test Status
2 and 5	Amber	Failed Output Queue RAM Test
2 and 6	Amber	Failed Input Queue RAM Test
2 and 7	Amber	Failed Routing Table Test
2 and 8	Amber	Failed Port IC Test

Setting the Communication Mode (Full/Half)

The default communication mode is autonegotiation. However, the Configure button can be used to set any port to full-duplex or half-duplex operation. Use the Configure button to light the Full/Half display mode LED indicating that the transmission mode may now be set. (Refer to the previous Configure Button section in this chapter for information on setting the display mode.) Light the Select LED for the target port, then set the port status LED in the full-duplex row as shown in the following table:

Full/Half (Display Mode LED)	Condition	Indication
Steady light	ON	Transmission mode selection enabled
No light	OFF	Transmission mode selection disabled

Select (Port Selection LED)	Condition	Indication
Steady light	ON	Port selected
No light	OFF	Port not selected

Full-Duplex (Port Status LED)	Condition	Indication
Steady light	ON	Port is set for full-duplex operation
No light	OFF	Port is set for half-duplex operation

Setting Autonegotiation

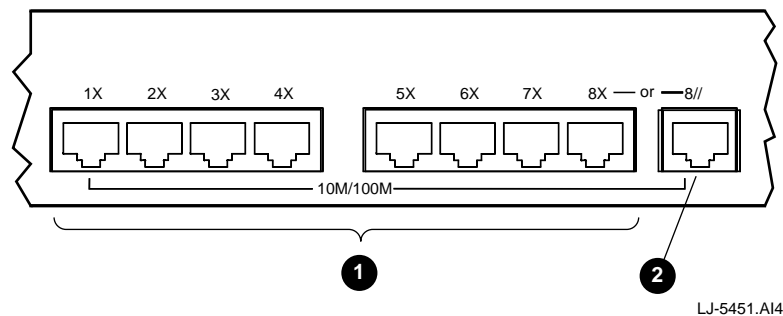
The factory default for all of the DEL8X ports is autonegotiation. Therefore, if the device to be attached to the switch also supports autonegotiation, or runs at half-duplex mode, you do not need to manually set the communication mode. If autonegotiation fails, the transmission mode will be set to half-duplex operation. To restore autonegotiation after manually configuring the transmission mode, unplug the connector from the concerned port on the DEL8X, then plug it back in again.

Note that any disruption in the link signal will cause a port to be reset to autonegotiation. For example, if you reset power to an attached device or it encounters a power fluctuation, the port will be reset to autonegotiation. Therefore, if any device attached to the DEL8X must run at full-duplex, but does not support autonegotiation, you may want to upgrade the device.

Full-duplex operation applies only to point-to-point access (for example, when attaching the DEL8X to a PC, workstation, server, or another switch). Repeater hubs use a common collision domain for all communications, and therefore cannot support full-duplex mode. When connecting the DEL8X to a repeater hub, use a standard cascaded connection set for half-duplex communications.

Ethernet Ports

The front panel on the DEL8X contains eight 8-pin MJ crossover-wired (x) Ethernet station ports ❶ and one additional straight-wired (8//) port ❷ for configuring a daisy-chain connection. Each port is attached to a dedicated collision domain, all of which are interconnected using a high-speed switching fabric. These ports are shown in the following figure and described in the following sections.



Hardware Description

The network access speed for all DEL8X ports automatically adjusts to match the speed of the attached device at 10 Mb/s or 100 Mb/s. (Note that the 100TX LED on the front panel will light if the attached device is running at 100 Mb/s.) Transmission speed is correctly sensed, even if an attached device does not support autonegotiation.

Station Ports

The station ports on the DEL8X can be connected to any device that uses a standard network interface. They are frequently connected to end-node devices (such as a high-speed server) or to a collapsed backbone (such as a bridge or router), which break up the collision domain. You can connect to any available station port on the switch (1x through 8x) using a 100-ohm screened twisted-pair (ScTP) or unshielded twisted-pair (UTP) cable. (Use a minimum of Category 5 ScTP or UTP cable for 100 Mb/s connections, or a minimum of Category 3 ScTP or UTP cable for 10 Mb/s connections.)

Daisy-Chain Port

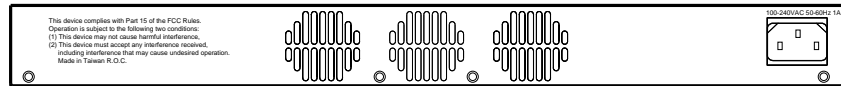
The straight-wired (8//) daisy-chain port can be connected to a compatible switch, hub, or to another network interconnection device. You can connect this port to a crossover-wired (x) port on the target device using a straight-through 100-ohm ScTP or UTP cable. (Use a minimum of Category 5 ScTP or UTP cable for 100 Mb/s connections, or a minimum of Category 3 ScTP or UTP cable for 10 Mb/s connections.) Refer to the Connecting to Another Network Device section in Chapter 3 for a more information on cascading.

Note

To connect to another switch or hub, you may also run straight-through twisted-pair cabling from a station port on the DEL8X to a crossover-wired (x) port on another device. However, if you must connect to another device using station ports at both ends of the cable, use crossover cable.

Power Socket

The DEL8X is equipped with a universal full-range power source. The power socket, located on the back panel (see the following figure), accepts 100 Vac to 240 Vac at 50 or 60 Hz.



LJ-5452.A14

3

Software Installation, Configuration, and Diagnostics

Setup and Configuration

Overview

This chapter provides information on the EtherWORKS Switch 8T/TX system setup that includes powerup diagnostics, and using the Configure button to perform diagnostic tests and to set display modes.

Diagnostic Tests

Upon powerup, the DEL8X performs an internal self–diagnostic test of major switch components. If any component fails during the test, the DEL8X will try to complete the diagnostic procedure. Otherwise, the system will hang. For related information, refer to the Diagnostics Display Mode section in Chapter 2.

The components to be tested include the following:

- System ROM
- System EEPROM
- Ports

During normal operation, you can use the Configure button any time you want the system to perform a diagnostic test. When testing begins, the system leaves normal operation. If no problem is encountered by diagnostics, the system automatically returns to normal operation.

Setting the Display Mode

This section describes the information available for each display mode and the corresponding LEDs. The display functions are listed in the sequence selected by the Configure button. For a more detailed description of these LEDs, refer to Chapter 2.

A long press on the Configure button is used to initiate basic configuration. (The LEDs light to indicate the configuration function.) A short press switches between functions. A second long press implements the current selection.

Port Status Display

Active LED: Status (ON)

This is the default display mode. It shows the percentage of packet collisions occurring out of the total packets transmitted by the respective port. The status of each port is also displayed, including information on transmit, receive, and link status.

Bandwidth Utilization

Active LED: Util% (ON)

In this mode, the statistical LEDs (the LED array labeled %) show the percentage of valid data handled by each port on the switch compared to available bandwidth.

Packet Forwarding Ratio

Active LED: Forward% (ON)

In this mode, the statistical LEDs (the LED array labeled %) show the percentage of packets that are forwarded by bridging hardware to another port on the DEL8X.

Packet Filtering Ratio

Active LED: Filter% (ON)

In this mode, the statistical LEDs (the LED array labeled %) show the percentage of packets that are filtered from the DEL8X by bridging hardware because the destination address is on the segment connected to the receiving port (that is, in the same segment with the source address).

Demonstration Function

Active LED: Demo (ON)

Enabling the Demo function will light all LEDs, one at a time. The LEDs will continue to light until the Demo function is disabled (Demo LED is OFF) using the Configure button.

Diagnostic Function

Active LED: Diag (ON)

Enabling the Diagnostic function will activate diagnostic tests similar to the one performed upon powerup. After successfully completing diagnostics, the system returns to normal operation. For diagnostic test details, refer to the Diagnostic Tests section in this chapter.

Communication Mode

Active LED: Full/Half (ON)

The transmission mode on the DEL8X is dynamically set to full-duplex or half-duplex if the connected device supports autonegotiation. If autonegotiation fails, the transmission mode defaults to half-duplex mode. Therefore, if any device attached to the switch does not support autonegotiation and does not operate at half-duplex mode, you must manually set the transmission mode for the connected port using the Configure button. To restore autonegotiation for any port, remove the cable connector from the port, then plug it in again.

Note

Full-duplex mode can be used only for a dedicated link. When connecting to a shared collision domain (for example, a repeater hub), set the transmission mode to half-duplex.

To manually set the transmission mode, use the following procedure:

1. Use the Configure button to light the Full/Half display mode LED.

Note that before the Configure button is released, the current communication mode selections will be displayed by the full-duplex LEDs for each port (that is the LEDs light for full-duplex mode and do not light for half-duplex mode). After the Configure button is released, the full-duplex LED for port 1 will begin to flash.
2. Use a long press to move to the required port (that is, light the Link LED for the target port).
3. To change the current setting for a port, use a short press to select the required transmission mode, then use a long press to effect the setting and move on to the next port.
4. When finished, use a long press to terminate transmission mode selection.

Verifying Port Status

Check each connection by viewing the port status LEDs shown in the following table. (Refer to Chapter 2 for further information on these LEDs.)

LED	State	Indication
100TX	ON	Communications have been set to 100 Mb/s
TX/RX	ON	Traffic is traversing the port
Full Duplex	ON	Communications have been set to full-duplex mode
Select/Link	ON	Port has established a valid network connection

If the Select/Link status LED is not functioning properly, or if you experience any other difficulties in setting up the switch, refer to Appendix A for troubleshooting information.

Overview

The EtherWORKS Switch 8T/TX provides a segmented network architecture. Any port can be attached to a shared collision domain or provide a dedicated link to a single network device. When a port on the switch is connected to an Ethernet hub (such as a 10 Mb/s or 100 Mb/s repeater), the bandwidth provided by that port is shared by all the devices connected to the attached hub. When a port is connected to an end node or to a device that divides the collision domain (such as a bridge, router, or another switch), the attached device has access to the full bandwidth provided by that port.

DEL8X Functions

The DEL8X provides the following functions:

- **Bridging**—The fully transparent bridging functions automatically learn node addresses, which are subsequently used to filter and forward all traffic based on the destination address. When traffic passes between devices attached to the same shared collision domain, those packets are filtered from the switch. When traffic must be passed between unique segments (different ports on the switch), a temporary link is set up between the switch ports that need to pass this traffic by using the high-speed switching fabric.
- **Switching**—When the switch forwards traffic, the scheme used to process data is automatically adjusted both to enhance data integrity and optimize system performance. Cut-through or fragment-free cut-through switching methods are used, depending on the current CRC error rate. (Refer to the Switching Methods section in Chapter 1 for further information on these processing methods.)

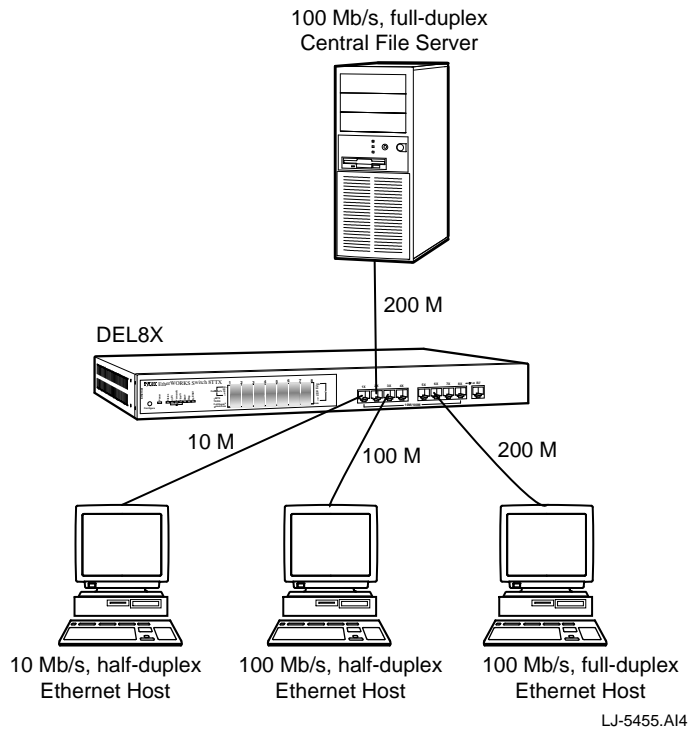
Applications

- **Flexible Configuration**—The switch is designed to segment your network and to provide a wide range of options in setting up network connections. It can be used as a simple standalone switch, or it can be connected with standard repeater hubs, switches, or other network interconnection devices through various configurations.

Some of the common applications for the DEL8X are described and illustrated in the next sections

Collapsed Backbone for Starter Network

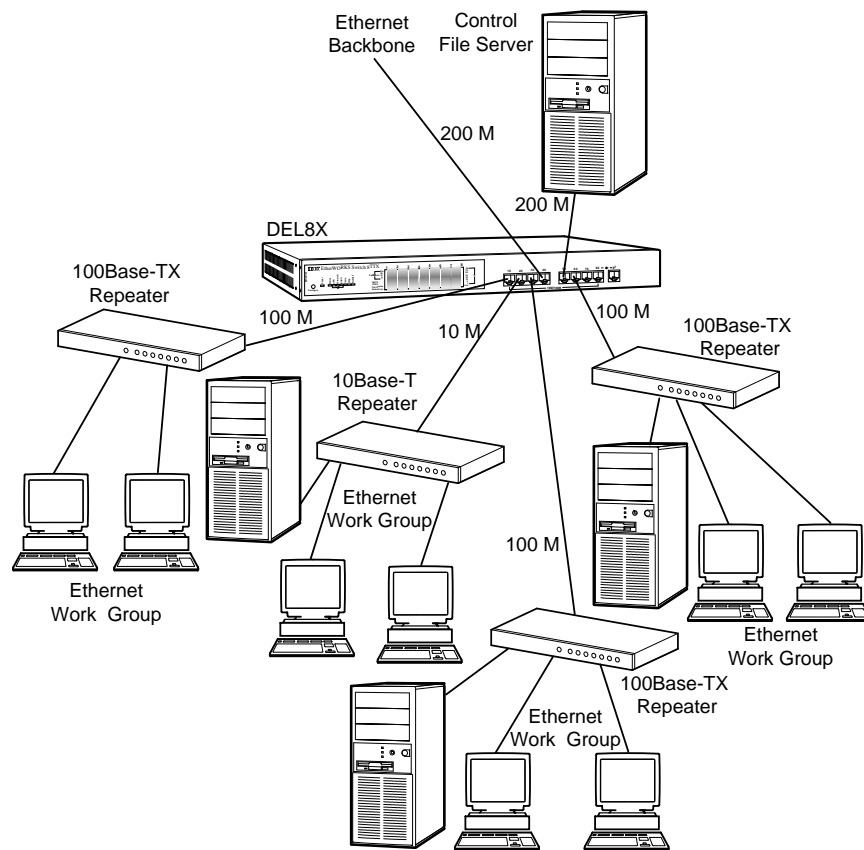
The DEL8X is an excellent choice for new Ethernet installations where significant growth is expected in the near future (see the following figure). You can easily build on this basic configuration, adding direct full-duplex connections to PCs, workstations, or servers (up to 200 Mb/s of dedicated bandwidth per node). When further expansion is needed, you can then cascade any IEEE 802.3 or IEEE 802.3u compliant switch or hub. The switch can also be easily integrated with any upper-level protocol devices you later add into the network, such as a firewall router.



Multiport Bridge with High-Bandwidth Backbone

Most networks are interconnected with traditional two-port bridges that insert significant latency into normal communications. For traffic that must pass through several bridges to reach its destination, this latency can degrade communications considerably. With eight distinct parallel dual-speed bridging ports (that is, eight distinct collision domains), the DEL8X can collapse a complex network into a single, efficient, bridged node, thereby increasing overall bandwidth and throughput.

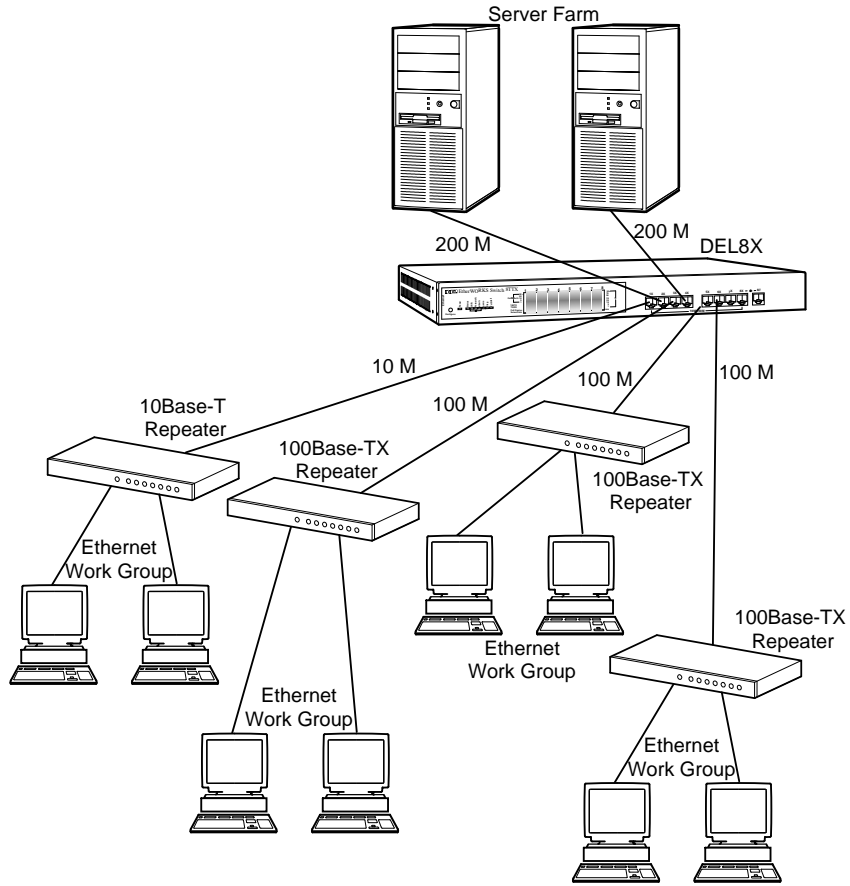
Segments attached to the DEL8X no longer have to cross the backbone, now reaching each other at near zero latency. However, for high-bandwidth applications that must pass data across the network backbone, each port can still provide a 100 Mb/s full-duplex, high-speed “fat pipe” for fast access (see the following figure).



LJ-5456.A14

High-Bandwidth File Server

The DEL8X is not only used to boost bandwidth for work groups, but also to enhance network throughput when accessing high-volume file servers. The DEL8X provides parallel communications between each of its ports, which can run up to 200 Mb/s in full-duplex mode. It makes key servers (or other heavily used network devices) available to more users by allowing multiple conversations to occur concurrently, thereby significantly expanding overall throughput. The DEL8X also helps you to centralize multiple servers in a single location, easing supervision and maintenance (see the following figure).



LJ-5457.A14

Note

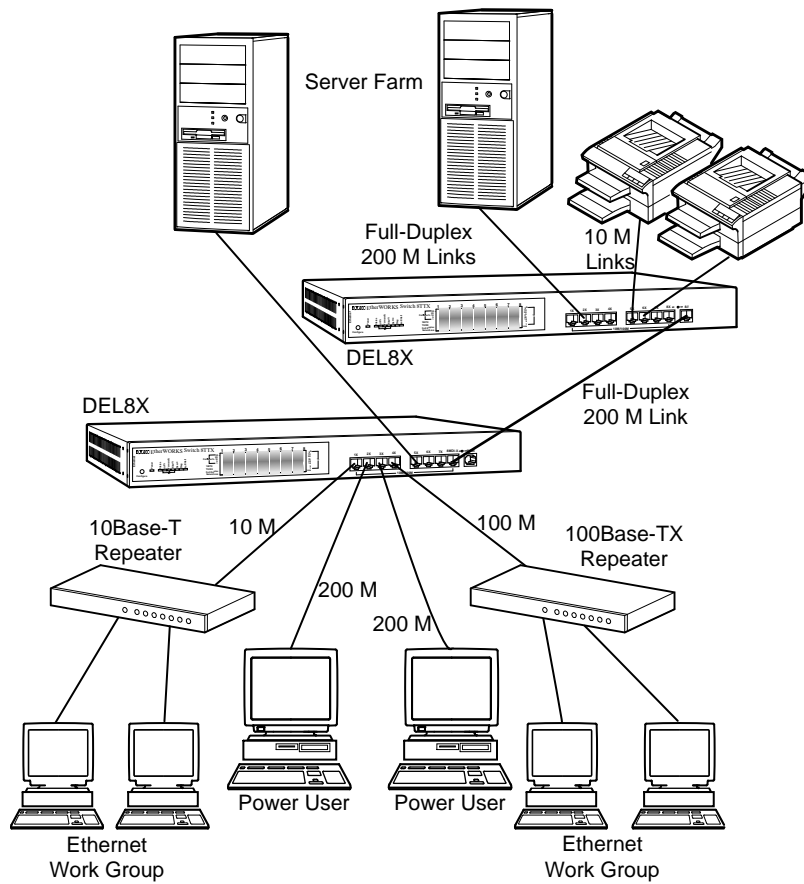
Full-duplex operation applies only to point-to-point access (for example, when attaching the DEL8X to a PC, workstation, server, or another switch). When connecting to repeater hubs, use a standard cascaded connection set for half-duplex operation.

High-Speed Link Between Switches

The most common LAN implementations use a combination of standard repeater hubs, bridges, and routers. The bridges and routers quickly become bottlenecks, reducing overall network throughput. Switching to higher speed LANs, such as FDDI or ATM, is not a good choice for most people. Besides being very expensive, you have to replace all existing Ethernet cable and adapters, restructure your network, then implement more expensive administration procedures.

Applications

By using switches instead of bridges and routers to tie together LAN segments, you retain a cohesive LAN structure in which any node can freely communicate with any other node in the network (see the following figure). For network applications that require routers (for example, interconnecting dissimilar network types), attaching switches directly to a router can significantly improve overall Ethernet performance.



LJ-5458.A14

Overview

The EtherWORKS Switch 8T/TX can be easily monitored through its comprehensive array of LEDs located on the front panel. This appendix describes common problems you may encounter and possible solutions.

Diagnosing DEL8X LEDs

The LEDs on the DEL8X assist the network manager in identifying potential problems.

The following table describes the common LED problems and possible solutions:

Symptom	Cause	Solution
Link LED does not light (green) after making a connection.	Computer's NIC, cable, or DEL8X port is defective.	Verify that the switch and attached device are on. Be sure the cable is plugged into both the switch and corresponding device. Verify that the proper cable type is used and its length does not exceed specified limits. Check the NIC and cable connections for possible defects. Replace the defective NIC or cable.
Power LED does not light (green) after powerup	Power supply, CPU, or cord is defective.	Check the cord and wall outlet. Replace the cord if defective. If the power supply or CPU is defective, see your reseller or Authorized Digital Distributor.

Troubleshooting

Use the diagnostic procedures described in Chapter 2 to verify that all other system components are functioning properly. If any component fails the diagnostic test, contact your Digital Services Representative.

System Diagnostics

This section describes the system components to be verified.

Power and Cooling Problems

If the power LED does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply. If the unit powers off after running for a while, check for loose power connections, power losses, or surges at the outlet, then verify that all fans on the back panel of the switch are unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective. If this is the case, see your reseller or Authorized Digital Distributor.

Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning, test them in an alternate environment where you are sure that all the other components function properly.

Transmission Mode

If you have any attached devices that operate at full-duplex mode but do not support autonegotiation, then manually set the transmission mode for the corresponding port on the switch. (Refer to Setting the Communication Mode section in Chapter 2.)

The default method of selecting the transmission mode for each port is autonegotiation. Therefore, if the link signal is disrupted (for example, by unplugging the network cable and plugging it back in again or by resetting the power), the port will try to reestablish communications with the attached device using autonegotiation. If autonegotiation fails, then communications are set to half-duplex mode by default. Based on this type of industry standard correction policy, if you are using a full-duplex device that does not support autonegotiation, communications can be easily lost (that is, reset to the wrong mode) whenever the attached device is reset or experiences a power fluctuation. The best way to resolve this problem is to upgrade all attached devices that must operate at full-duplex to ensure that they also support autonegotiation.

Cabling

Verify the DEL8X cabling as follows:

1. Check that you are using the correct cable type. Be sure that all cable connectors are securely seated in the required ports. Use 100-ohm straight-through cables for all standard twisted-pair connections. Use Category 5 ScTP or UTP cables for 100 Mb/s Fast Ethernet connections, or Category 3, 4, or 5 ScTP or UTP cables for standard 10 Mb/s Ethernet connections.
2. Make sure all devices are connected to the network. Equipment may have been unintentionally disconnected from the network.
3. When cascading two switches using 8-pin MJ station ports at both ends of the cable (not the daisy-chain port), make sure a crossover cable is used. A crossover cable should be used only if the daisy-chain port is not available on either switch.

External Adapters

Verify the following:

1. The network adapter cards installed in the computers are in good working condition.
2. The network interface hardware and software drivers for the attached devices are functioning properly.

Configuration

If a problem occurs after altering the network configuration, restore the original connections, then try to isolate the problem by implementing the new changes, one step at a time. Ensure that cable distances, repeater limits, and other physical aspects of the installation do not exceed recommendations.

DEL8X Integrity

Verify the integrity of the DEL8X with a poweron reset. Turn the power to the DEL8X off, then on. If the problem persists and you have completed the previous diagnoses, then contact your Digital Services Representative.

General Information

Overview

This appendix provides the following general EtherWORKS Switch 8T/TX information:

- Physical characteristics
- Regulatory standards compliance
- Operating environment and power requirements
- Connector pin assignments
- Other Digital network adapter products

Physical Description

The DEL8X switch measures 440 mm (17.37 inches) by 285 mm (11.25 inches) and is 43 mm (1.69 inches) in height. The switch weighs 3.72 Kg (8.2 lbs.).

The DEL8X has eight 8-pin MJ 10Base-T or 100Base-TX ports.

Conformance

The DEL8X conforms to the following IEEE standards and media-supported specifications:

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-TX

Operating Environment Specifications

The following table lists the operating environment and power requirements for the DEL8X:

Specification	Rating
Operating temperature (sea level)	0°C to 50°C (standard operating)
Relative humidity	5% to 95% (noncondensing)
Radiated emissions	FCC, CISPR Class A VCCI Class I CE Mark
Safety	UL, CSA, TUV/GS
Immunity	IEC 801-2, 3, 4, 6
Power requirements	100 Vac to 240 Vac, 50 or 60 Hz, 45 W maximum

Bridging Criteria

The following table lists the bridging criteria for the DEL8X:

Criteria	Description
Network bridging function	Filtering, forwarding, and learning
Switching method	Adaptive cut-through
Maximum filtering rate	Full line speed
Maximum forwarding rate	Full line speed
Network latency	Less than 20 microseconds
Address table	4K entries/port
Queue buffer	256 KB per port

Acoustical Specifications

The following table lists the acoustical declarations for the DEL8X:

Acoustics—Declared values per ISO 9296 and ISO 7779

Product	Sound Power Level L_{WAd} B	Sound Pressure Level L_{pAm} dBA (bystander positions)
	Idle/Operate	Idle/Operate
DEL8X	6.1	44

Current values for specific configurations are available from Digital Equipment Corporation representatives (1 B = 10 dBA).

Schallemissionswerte—Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779

Produkt	Schalleistungspegel L_{WAd} B	Schalldruckpegel L_{pAm} dBA (Zuschauerpositionen)
	Leerlauf/Betrieb	Leerlauf/Betrieb
DEL8X	6,1	44

Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich (1 B = 10 dBA).

Safety Compliance

Underwriters Laboratories Inc.

Check the label on the power cord against the specifications in the following table to ensure that you have the correct cord set:

Operating Voltage	Cord Set Specifications
120 Volts	UL Listed/CSA Certified Cord Set Minimum 18 AWG Type SVT or SJT three conductor cord Maximum length of 15 feet Parallel blade, grounding type attachment plug rated 15A, 125V
240 Volts (for North America)	UL Listed/CSA Certified Cord Set Minimum 18 AWG Type SVT or SJT three conductor cord Maximum length of 15 feet Tandem blade, grounding type attachment plug rated 15A, 125V
240 Volts (for Europe only)	Cord Set with H05W-F cord having three conductors with minimum diameter of 0.75 mm IEC-320 receptacle Male plug rated 6A, 250V

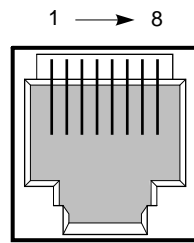
The unit will automatically select the setting that matches the input voltage connected. Therefore, no additional adjustments are necessary when connecting it to any input voltage within the range marked on the back panel.

Connector Pin Assignments

This section describes the DEL8X connector pin assignments.

8-Pin MJ Port

The DEL8X twisted-pair network connector pin signals are shown in the following figure and explained in the following table:



LJ-4797.A14

Pin	Ports 1x Through 8x	Daisy-Chain Port 8//
1	Input Receive Data+	Output Transmit Data+
2	Input Receive Data-	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data+
6	Output Transmit Data-	Input Receive Data-
4, 5, 7, 8	Not used	Not used

Other Digital Network Products

The EtherWORKS Switch 8T/TX is part of a complete family of low-cost network switches, adapters, and boot ROMs developed by Digital Equipment Corporation. Other products are listed in the following table.

Product	Order Number	Description
Fast EtherWORKS PCI 10/100 Adapter	DE500-AA	Provides a single 10 Mb/s or 100 Mb/s 8-pin MJ port to connect to IEEE 802.3 Ethernet networks.
EtherWORKS Switch 6T/2TX	DEL6X-AA (U.S., Japan, Canada power cord)	Provides five 10 Mb/s 8-pin MJ ports and one 10Mb/s combo port to connect to a PC, server, or workstation, and two 100-Mb/s Fast Ethernet ports to connect to a backbone or server.
EtherWORKS Switch 2TTX	DEL2X-AA (U.S., Japan, Canada power cord)	Provides two 10/100 Mb/s 8-pin MJ ports to connect to a subnetwork or directly to a PC, server, or workstation.
EtherWORKS Hub 8TX Repeater	DELXR-AA (U.S., Japan, Canada power cord)	Provides eight 100 Mb/s 8-pin MJ ports to connect to a PC or workstation, and one daisy-chain port to connect to another repeater.
EtherWORKS Turbo PCI 10 Adapter	DE450-CA, DE450-TA	Provides capability to integrate PCI-compatible systems using twisted-pair, AUI, or ThinWire cables to 10-Mb/s Ethernet networks.
EtherWORKS 3Turbo Adapter	DE204, DE205	Provides capability to integrate ISA/EISA-compatible systems using twisted-pair, AUI, or ThinWire cables to 10-Mb/s Ethernet networks.
EtherWORKS Turbo EISA Adapter	DE425-AA	Provides capability to integrate EISA-compatible systems using twisted-pair, AUI, or ThinWire cables to 20-Mb/s Ethernet networks.
EtherWORKS PCMCIA Turbo Adapter	DEPCM-*A	Provides a credit card sized adapter link for laptop/notebook PCs to a 10-Mb/s Ethernet network.
DE45X Remote Boot ROM	DE45M-AR, DE45F-AR	The DE45M enables you to perform a remote boot using MOP or RPL protocols when installed on an EtherWORKS Turbo PCI 10 (DE450) adapter. The FLASH version (DE45F) uses MOP, RPL, NetWare, and BootP protocols.
DE20M Remote Boot ROM	DE20M-AR	Enables you to perform a remote boot using MOP or RPL protocols when installed on an EtherWORKS 3 Turbo adapter.
DEC FDDIcontroller/PCI Adapter	DEFPA-*B	Provides direct connection of industry standard computers with a PCI I/O bus to 100-Mb/s FDDI networks.
DEC FDDIcontroller/EISA Adapter	DEFEA-AB, DB, MA, UA	Provides direct connection of industry standard computers with EISA I/O bus to 100-Mb/s FDDI networks.

Ordering Information

To order these products, contact an Authorized Digital Distributor or Digital sales representative. For more information, call 800-457-8211 in the U.S. and Canada, 508-692-2562 in other locations, or your local sales office.

Limitations of Shared Ethernet

Overview

This appendix describes some of the limitations of shared Ethernet.

Single Collision Domain

With traditional Ethernet, each device is attached to the network using the same transmission media. This means that each device is forced to access a shared collision domain. Your network may support data rates of 100 Mb/s with Fast Ethernet (100Base-TX) or you may still be using the slower rate of 10 Mb/s provided by conventional Ethernet (10Base-T). Regardless of the data rate, each station accessing the network must first obtain exclusive access to the entire collision domain (that is, attached media segment) before transmitting data. Therefore, whenever two or more stations attempt to transmit at the same time, the data packets collide and the stations must then back off and try again after waiting for a random length of time.

Restrictive Throughput

Under this situation, the network can easily be congested when utilization exceeds more than 20 to 30% of available bandwidth. At 40 to 50% utilization, actual throughput quickly falls below 20%. This shows that the data rates promised by traditional Ethernet rarely live up to expectations. In contrast, the DEL8X delivers steady throughput even when network utilization runs well above 70%.

Failure of Alternate Solutions

With the advent of high-bandwidth devices and applications such as multimedia, several advanced servers and high-end workstations can quickly saturate the network. You may find some temporary relief by partitioning the network into smaller segments with bridges and routers. However, the delay required by bridges and routers for processing each packet may actually slow down communications at the work-group level. Moreover, the administrative costs of setting up and maintaining a complex network architecture almost always exceed initial projections. Even FDDI and ATM provide only a finite bandwidth (up to 100 Mb/s for FDDI or 156 Mb/s for ATM) at a cost that is normally prohibitive.

Glossary

8-pin RJ connector

Most common terminator for twisted-pair wiring.

10Base-T

IEEE specifications for 10 Mb/s Ethernet using unshielded or screened twisted-pair cable (UTP or 100-ohm ScTP). The maximum length of cable for a point-to-point connection is 100 meters.

100Base-TX

IEEE specifications for 100 Mb/s Ethernet using unshielded or screened twisted-pair cable (UTP or 100-ohm ScTP). The maximum length of cable for a point-to-point connection is 100 meters.

bus topology

A network topological arrangement where only one path exists between any two nodes and data transmitted by any node is concurrently available to all other nodes on the same transmission medium.

collision

A condition in which two packets transmitted over a medium interferes with each other. Their interference makes both signals unintelligible. The transmitting devices have to halt transmission for a random period of time before trying to send data again. Note that collisions do not occur on full-duplex connections.

Glossary

configuration

The way to set up a computer, server, or local area network.

connection

A logical binding between two or more users of an interconnection service.

daisy-chain

A serial connection of devices with or without a faceplate. On the DEL8X, the straight-wired port (8//) can be used to connect to other switches or compatible hubs in a daisy-chain configuration.

Ethernet

A network communication system developed and standardized by Digital, Intel, and Xerox, using baseband transmission, CSMA/CD access, logical bus topology, and coaxial cable. The successor IEEE 802.3 standard provides for integration into the OSI model and extends the physical layer and media with repeaters and implementations that operate on fiber optics, broadband, and twisted-pair cable.

Fast Ethernet

100 Mb/s network communication system based on Ethernet and the CSMA/CD access method.

IEEE 802.3 standard

Standard for the physical and electrical connections in local area networks (LANs) developed by the IEEE. The IEEE 802.3u standard covers these same issues for 100 Mb/s networks.

LED

Light-emitting diode. A semiconductor device used as an indicator or control light in electronic hardware. On the front panel of the DEL8X, LEDs are used to monitor a switch or network condition.

local area network (LAN)

A group of interconnected computers and support devices.

screened twisted-pair (ScTP)

A 100-ohm screened twisted-pair cable.

unshielded twisted-pair (UTP)

Cable composed of two insulated wires twisted together to reduce electrical interference; used in common telephone cord.