

# EtherWORKS Hub 8TX

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## Installation Guide

Order Number: EK-DELXR-OM. A01

**November 1995**

This document describes how to install and operate the EtherWORKS Hub 8TX repeater.

**Revision/Update Information:** This is a new document.

## **FCC Class A Certification**

### **FCC ID: HEDEH3042S-TX**

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.

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.

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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 is found compliant with the requirements of CISPR-22 Class A and is eligible to bear the CE Mark label.

This is to certify that this product complies with ISO/IEC Guide 22 and EN45014 and conforms to the following specifications:

EMC: EN55022(1988)/CISPR-22(1985) Class A

prEN55024-2(1990)IE801-2(1991) 4 kV CD8 kV AD

prEN55024-3(1991)IE801-3(1984) 3 V V/mV

prEN55024-4(1992)IE801-4(1988) 1 kV (power line)

0.5 kV (signal line)

This product complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

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# Preface

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## About This Manual

### Manual Contents

This manual describes how to install and operate the EtherWORKS Hub 8TX repeater.

### Intended Audience

This guide is designed for the experienced network installer.

### Conventions

The following conventions are used in this manual:

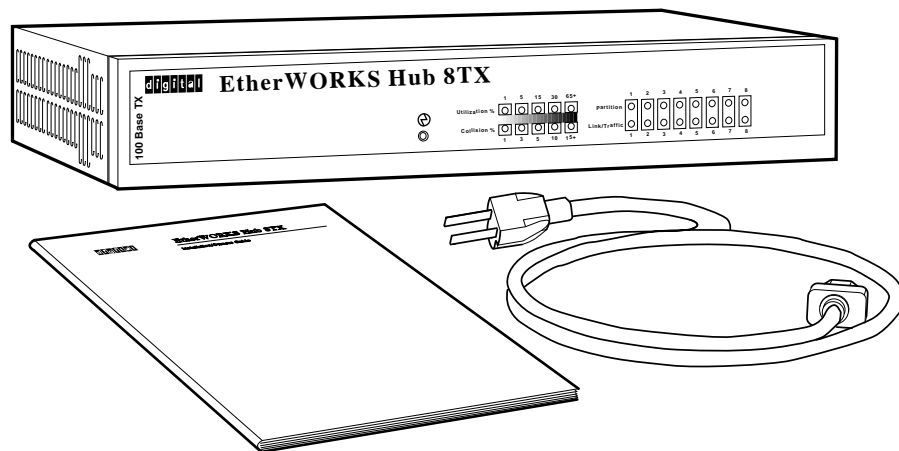
| Convention         | Description   |
|--------------------|---|
| <b>Note</b>        | Contains information of special importance.                                     |
| <i>Italics</i>     | In examples, indicates a variable. In text, indicates emphasis or a book title. |
| Monospaced<br>type | Indicates a literal example of system output.                                   |

## Kit Contents

The EtherWORKS Hub 8TX kit contains the following:

- The EtherWORKS Hub 8TX repeater
- This installation guide
- Power cord (country-specific)

Figure 1 EtherWORKS Hub 8TX Kit Contents



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# Chapter 1

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## Introduction

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### Overview

This guide contains information required to install and operate the EtherWORKS Hub 8TX repeater (hereafter referred to as the Hub 8TX).

The Hub 8TX is a smart 8-port Class II 100BASE-TX repeater that complies with the IEEE 802.3u standard. The Hub 8TX is used for 100 megabits per second (100-Mb/s) Ethernet networks. It can link two to eight PCs or workstations using Category 5 unshielded or screened twisted-pair (UTP or ScTP) cables to form a simple, fast Ethernet LAN. The Hub 8TX also contains a daisy-chain port to connect to another compatible repeater using twisted-pair cable.

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## Features

The main features of the Hub 8TX are as follows:

- Conforms to the IEEE 802.3u repeater specification and the 100BASE-TX standard
- Transmits data at 100 Mb/s for demanding applications
- LED indicator panel includes utilization and collision rate LEDs for reporting repeater activity/configuration, and facilitating problem diagnosis
- Eight independent MJ8 ports for connections using 100BASE-TX Category 5 UTP or ScTP cable
- One MJ8 port for daisy chaining
- Automatically partitions bad ports to protect the network system
- Automatic polarity detection and correction permits automatic adjustment for wiring errors
- Easy desktop installation
- Internal full-range power supply for 100 VAC to 240 VAC, at 50 to 60 Hz power application
- Cost effective
- Ready to run with all network operating systems and protocols

# Chapter 2

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## Hardware Description

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### Introduction

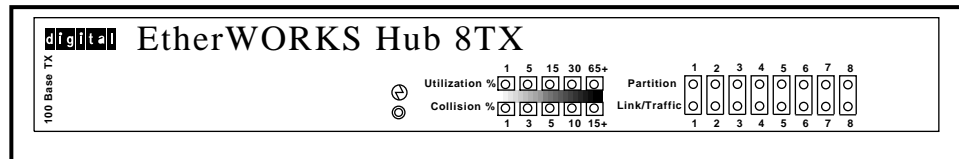
This chapter briefly describes the important parts of the EtherWORKS Hub 8TX repeater

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## Front Panel

The front panel of the Hub 8TX contains the LED indicators that monitor various network conditions, such as the status of each station port or the overall condition of the Hub 8TX (see Figure 2-1). Each station port contains two LEDs to monitor port link and traffic, or partition conditions. The overall repeater status relates to power, network utilization, and collision rate.

**Figure 2-1 EtherWORKS Hub 8TX Front Panel**



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The following table lists and describes the possible LED states for the Hub 8TX.

| <b>Item</b> | <b>LED</b>   | <b>Color</b> | <b>Description</b>                                     |
|-------------|--------------|--------------|--|
| 1           | Power        | Green        | Lights when the repeater has power.                    |
| 2           | Utilization  | Green        | Traffic is 1% to 30% of Ethernet bandwidth (100 Mb/s). |
|             |              | Yellow       | Traffic is 30% to 65%.                                 |
|             |              | Red          | Traffic is 65% or higher.                              |
| 3           | Collision    | Green        | Collision rate is 1% to 10%.                           |
|             |              | Yellow       | Collision rate is 10% to 15%.                          |
|             |              | Red          | Collision rate is 15% or higher.                       |
| 4           | Partition    | Red          | MJ port is partitioned.                                |
| 5           | Link/Traffic | Green        | MJ port linked; flashes to indicate traffic.           |

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## Back Panel

The back panel of the Hub 8TX contains 8 MJ station ports, one convertible daisy-chain port, and a power socket (see Figure 2-2). Each station port provides 100 Mb/s Ethernet bandwidth for connection to a PC, workstation, server, or another compatible repeater (using a crossover port on the other repeater). A standalone Hub 8TX can link two to eight systems using Category 5 UTP or ScTP cables to form a simple fast Ethernet LAN. As your network grows, you can daisy-chain another 100BASE-TX Class II repeater without using any crossover cable.

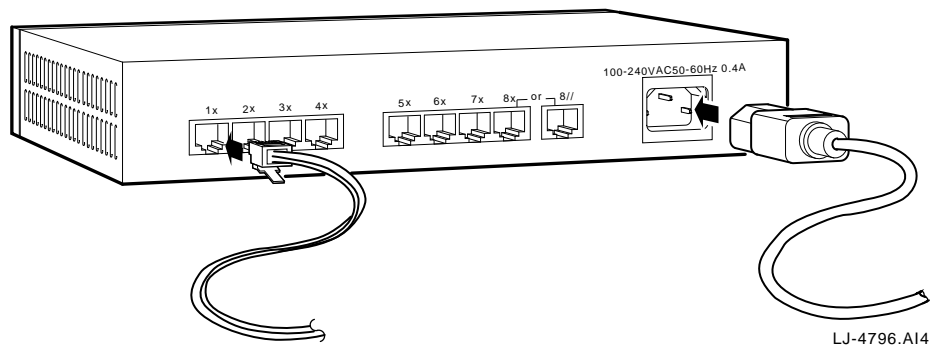
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### Note

When the daisy-chain port is used, port 8 cannot be connected to a station.

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**Figure 2-2 EtherWORKS Hub 8TX Back Panel**



### Power Socket

The power socket accepts AC power from 100 V to 240 V at 50 to 60 Hz.

# Chapter 3

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## Hardware Installation and Configuration

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### Overview

This chapter describes how to install and configure the EtherWORKS Hub 8TX repeater. Once installed, you can configure the Hub 8TX as a standalone system, or in a network using up to eight systems.

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## Installation Procedure

To install the Hub 8TX, complete the following steps:

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| Step | Action  |
|------|---|
| 1    | Select an appropriate table- or desk-top location.  |
| 2    | Connect your system to an available MJ8 port on the Hub 8TX using Category 5 UTP or ScTP cable. All end-node devices must be within 100 meters of the connected repeater. |
| 3    | Use the MJ8 daisy-chain port to connect the Hub 8TX to another repeater in a daisy-chain configuration.   |
| 4    | Plug the power cable into the repeater, then connect it to an electrical outlet.  |

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**Note**

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Digital recommends using BN25G-xx (UTP) or BN26M-xx (ScTP) point-to-point twisted-pair patch cable for connections. The xx stands for cable length in meters.

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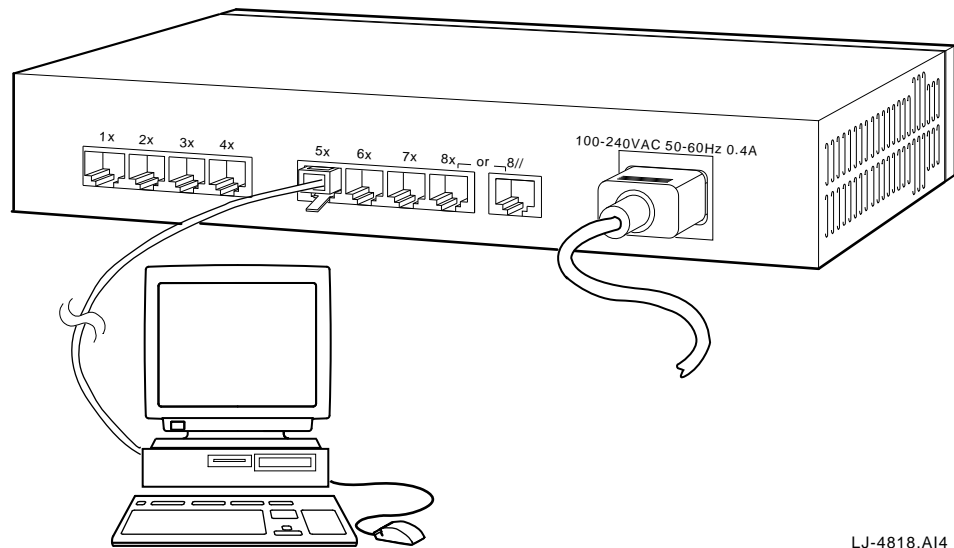
## Configuration

The Hub 8TX allows flexibility in configuring your network. You can use the repeater in a standalone or daisy-chain configuration.

### Standalone Configuration

The Hub 8TX can be used in a simple standalone configuration (see Figure 3-1). In compliance with the IEEE 802.3u standard, the maximum cable distance between the repeater and any system is 100 meters.

**Figure 3-1 Standalone Configuration**

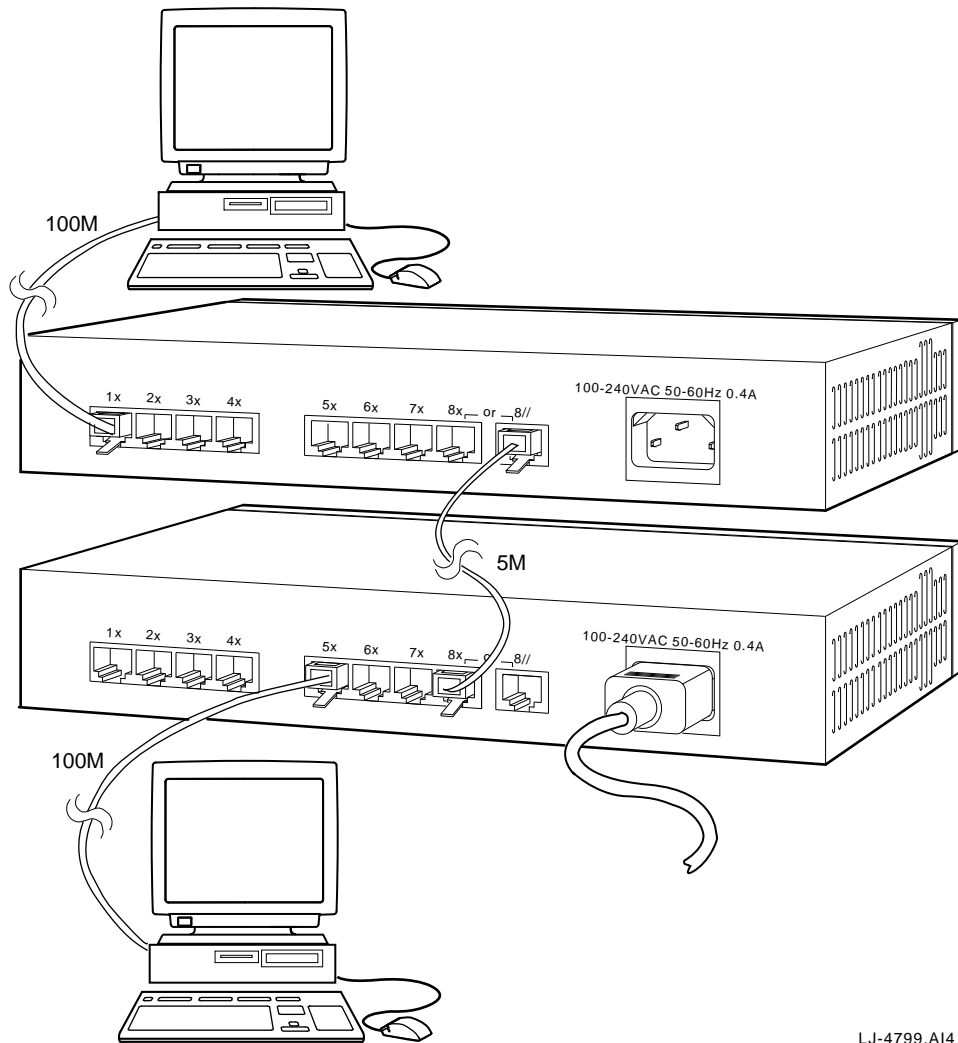


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## Daisy-Chain Configuration

The Hub 8TX provides a daisy-chain port (8x or 8//) that you can use to easily connect to another compatible repeater (see Figure 3-2).

Figure 3-2 Daisy-Chain Configuration



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## Cable Limitations

To configure your Hub 8TX network, use the following guidelines to ensure that the overall length between any two nodes does not exceed the limits set by the IEEE 802.3u standard:

- The maximum cable length from any repeater port to an end node is 100 meters.
- The maximum cable length between two repeaters should not exceed 5 meters.



# Chapter 4

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## Problem Solving

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### Introduction

This chapter describes the EtherWORKS Hub 8TX LED states and provides problem-solving information.

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## LED Indications

The following table lists the LED states for various error conditions and suggest corrective actions..

| Symptom                       | Probable Cause   | Corrective Action  |
|-------------------------------|--|--|
| Partition indicator turns on. | Hub 8TX has partitioned 100BASE-TX 8-pin MJ port.                          | If port partitioning has occurred, the Hub 8TX will automatically enable the port when the faulty condition disappears.  |
| Link/Traffic LED remains off. | PC or workstation's network adapter, cable, or repeater port is defective. | Check the corresponding cable connections, or the adapter, for possible defects. Verify that the correct cable type (straight-through or crossover) is being used. Replace the defective cable or adapter. |

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## Problem-Solving Tips

Consider the following tips before you begin problem-solving procedures:

- Ensure that the cable distances, repeater limits, and other physical aspects of the installation do not exceed IEEE 803.2u recommendations.
- Verify that the cabling type used is correct, then tighten all cable connections.
- Ensure that the network adapter installed in your system and the cable connections are in good working condition.
- Ensure that your network is properly configured, and that all repeaters are connected to the network. A repeater may unintentionally be disconnected from the network.
- You cannot use the station port 8 and the daisy-chain port at the same time. Make sure that when you use the daisy-chain port, port 8 is not connected to any node.





# Chapter 5

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## General Information

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### Introduction

This chapter provides the following general EtherWORKS Hub 8TX repeater information:

- Physical characteristics
- Operating environment and power requirements
- Pin assignments

### Physical Description

The Hub 8TX repeater measures 10.75 inches (273 mm) by 6.54 inches (166 mm) and is 1.69 inches (42.9 mm) in height. The Hub 8TX conforms to IEEE 802.3u 100 BASE-TX Class II repeater standards.

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## Operating Environment Specifications

The following table lists the operating environment and power requirements for the Hub 8TX.

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| <b>Specification</b>              | <b>Rating</b>   |
|-----------------------------------|---|
| Operating temperature (sea level) | 0°C to 40°C (standard operating)  |
| Relative humidity                 | 5% to 95% (noncondensing)   |
| Radiated emissions                | FCC, CISPR Class A<br>VCCI Class 1<br>CE Mark<br>Safety UL<br>CSA<br>TUV/GS |
| Power requirements                | 100 VAC to 240 VAC, 0.4 A<br>(maximum), 50/60 Hz (full range)               |

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## Acoustical Specifications

The following table lists the acoustical specifications for the Hub 8TX.

### Acoustics - Preliminary declared values per ISO 9296 and ISO 779:

| Product | Sound Power Level | Sound Pressure Level                   |
|---------|-------------------|--|
|         | $L_{WAd}$ B       | $L_{pAm}$ dBA<br>(bystander positions) |
|         | Idle/Operate      | Idle/Operate                           |
| DELXR   | 5.7               | 41                                     |

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

### Schallemissionswerte - Vorläufige Werteangaben nach ISO 9296 and ISO 7779/DIN EN27779:

| Produkt | Schalleistungspegel | Schalldruckpegel                       |
|---------|---------------------|--|
|         | $L_{WAd}$ B         | $L_{pAm}$ dBA<br>(Zuschauerpositionen) |
|         | Leerlauf/Betrieb    | Leerlauf/Betrieb                       |
| DELXR   | 5,7                 | 41                                     |

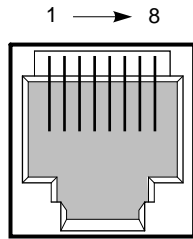
Aktuelle Werte für spezielle Ausrüstungsstufen sind über die Digital Equipment Vertretungen erhältlich. 1 B = 10 dBA.

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## Connector Pin Assignments

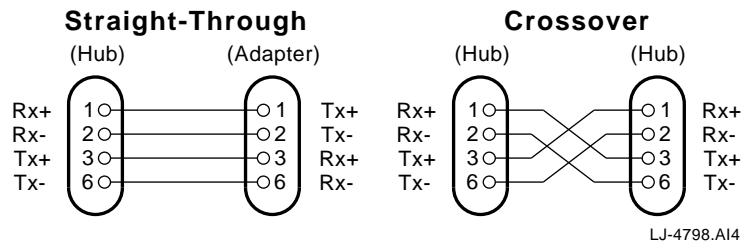
The Hub 8TX 100 BASE-TX twisted-pair network connector pin signals are shown in Figure 5-1 and Figure 5-2, and explained in the following table..

**Figure 5-1 MJ Port Pin Assignments**



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**Figure 5-2 Straight-Through and Crossover Cable Pin Assignments**



| <b>Pin</b> | <b>Assignment<br/>(Port 1x to 8x)</b> | <b>Assignment<br/>(Daisy-Chain Port 8//)</b> |
|------------|---------------------------------------|--|
| 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                                     |