

# DES-1016D 10/100 NWay Ethernet/ Fast Ethernet Switch User's Guide

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First Edition (Sept., 1999)

6DES1016D.02  
Printed In Taiwan



RECYCLABLE

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2. Heben Sie diese Anleitung für den spätern Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
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## CE Mark Warning

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# ***ABOUT THIS GUIDE***

Congratulations on your purchase of the 10/100 NWay Ethernet/Fast Ethernet Switch. This device integrates 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible package.

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## **Purpose**

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The purpose of this manual is to discuss the installation and use of your 16-port 10/100Mbps NWay Ethernet/Fast Ethernet Switch.

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## **Terms/Usage**

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For simplicity, this documentation uses the term “Switch” (first letter upper case) to refer to the DES-1016D Switch, and “switch” (first letter lower case) to refer to all switches, including the DES-1016D.

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## **Overview of this User's Guide**

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- ◆ Chapter 1, “*Introduction.*” Describes the Switch and its features.

- ◆ Chapter 2, “*Unpacking and Setup.*” Helps you get started with the basic installation of the Switch.
- ◆ Chapter 3, “*Identifying External Components.*” Describes the front panel, rear panel, and LED indicators of the Switch.
- ◆ Chapter 4, “*Connecting the Switch.*” Tells how you can connect the Switch to your Ethernet network.
- ◆ Appendix A, “*Technical Specifications.*” Lists the technical (general, physical and environmental, and performance) specifications of the Switch.
- ◆ Appendix B, “*RJ-45 Pin Specification.*” Describes the RJ-45 receptacle/connector and the straight and crossover cable connector.

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# ***INTRODUCTION***

This section describes the features of the Switch.

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## **Features**

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The Switch is designed for easy installation, a superior cost/performance ratio, and easy migration to a bandwidth-critical environment where traffic on the network and the number of users increases continuously.

The Switch supports auto-negotiation, allowing both 10Mbps and 100Mbps operation in full-duplex or half-duplex mode, even on all ports simultaneously.

Low price and compact dimensions make the Switch suitable for small and medium-size workgroups as well as SOHO environments, enabling users to migrate easily from traditional shared LANs to switched networks. Each full/half duplex port can be connected directly to high-demand nodes, such as workstations, servers, or other switches or hubs, to meet increased bandwidth and flexibility demands.

The Switch performs store-and-forward switching to ensure effective buffer allocation for each port. Data flow is controlled between the transmitting and receiving nodes to guarantee against all possible packet loss.

## ***Performance features***

- ◆ Sixteen high-performance 10/100Mbps NWay ports; all ports can auto-negotiate for full- or half-duplex operation
- ◆ Uplink (MDI-II) port for straight-through connection to another switch, hub or repeater
- ◆ Full wire-speed forwarding for 100Mbps Fast Ethernet (148,800 pps) and 10Mbps Ethernet (14,880 pps) on all ports
- ◆ High-performance 2M SGRAM packet buffer
- ◆ Up to 8K MAC address table
- ◆ IEEE 802.3x-compliant flow control for full duplex mode
- ◆ Back-pressure control for half duplex mode
- ◆ Store-and-forward packet switching supports rate adaptation and ensures data integrity
- ◆ A full complement of LED status indicators

# 2

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## ***UNPACKING AND SETUP***

This chapter provides unpacking and setup information for the Switch.

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### **Unpacking**

---

Open the shipping carton of the Switch and carefully unpack its contents. The carton should contain the following items:

- ◆ One 10/100 NWay Ethernet/Fast Ethernet Switch
- ◆ One AC power cord
- ◆ This User's Guide
- ◆ Four rubber feet with adhesive backing

If any item is found missing or damaged, please contact your local network supplier for replacement.

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## Setup

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The setup of the Switch can be performed using the following steps:

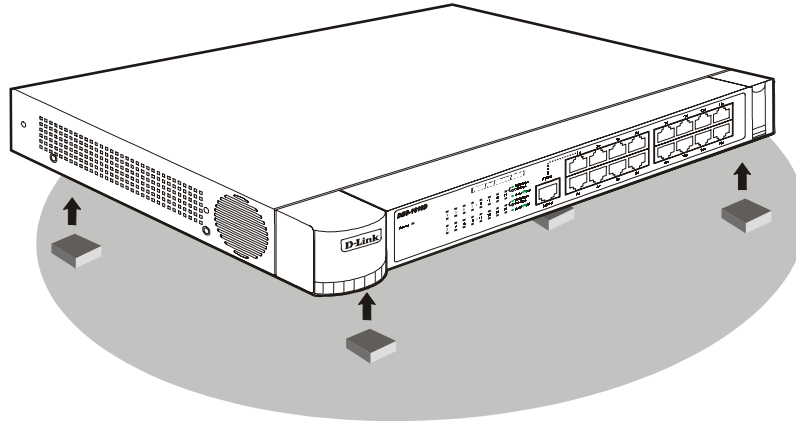
- ◆ The surface must support at least 5kg for the Switch.
- ◆ The power outlet should be within 1.82 meters (6 feet) of the device.
- ◆ Visually inspect the power cord and see that it is fully secured to the AC power connector.
- ◆ Make sure that there is proper heat dissipation from and adequate ventilation around the Switch. Do not place heavy objects on the Switch.

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## Desktop or Shelf Installation

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When installing the Switch on a desktop or shelf, the rubber feet included with the device must be first attached. Attach these cushioning feet on the bottom at each corner of the device. Allow enough ventilation space between the device and the objects around it.



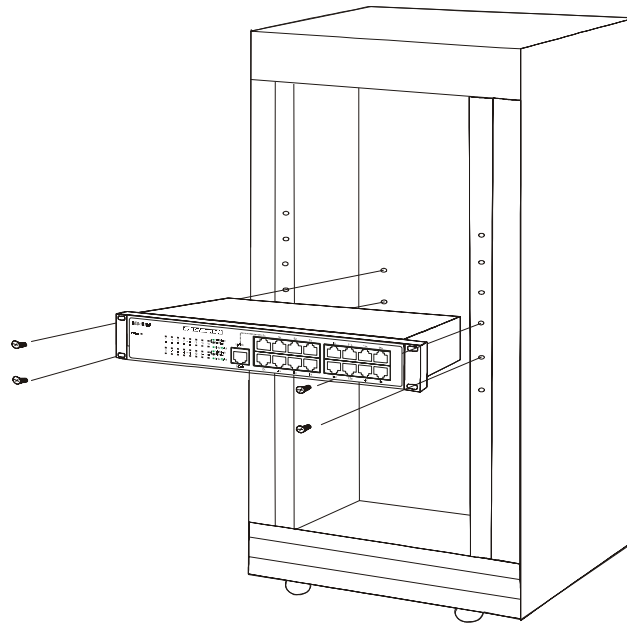
**Figure 2.1 10/100 NWay Ethernet/Fast Ethernet Switch installed on a Desktop or Shelf**

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## Rack Installation

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The Switch can be mounted in an EIA standard size, 19-inch rack, which can be placed in a wiring closet with other equipment. For information about the DFE-700B Rack Mounting Brackets, consult your computer hardware dealer. If you already possess the brackets, attach them on the Switch's front panel (one on each side), and then secure them with the provided screws. Then, use these screws provided with the equipment rack to mount each Switch in the rack. Follow the directions provided by the rack manufacturer.



**Figure 2.2** Installing the 10/100 NWay Ethernet/Fast Ethernet Switch in an equipment rack

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## Power on

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The Switch can be used with AC power sources 100 - 240 VAC, 50 - 60 Hz. The power switch is located at the rear of the unit adjacent to the AC power connector. To turn the Switch on, press the power switch to the on or "1" position. The Switch's power supply will adjust to the local power source automatically and may be turned on without having any or all LAN segment cables connected.



## ***LED Indicators***

After the switch is turned on, the LED indicators should respond as follows:

- ◆ All of the LED indicators will blink momentarily. This blinking of the LED indicators represents a reset of the system.
- ◆ The power LED indicator will remain ON.

## ***Power Failure***

As a precaution, the Switch should be turned OFF in case of a power failure. Press the power switch to the off or "0" position. When power is resumed, turn the Switch ON. At all times, avoid leaving the Switch ON if a power failure is anticipated.

# IDENTIFYING EXTERNAL COMPONENTS

This chapter describes the front panel, rear panel, and LED indicators of the Switch.

## Front Panel

The front panel of the Switch consists of sixteen (10/100 Mbps MDI-X) ports, one uplink (MDI-II) port, and LED indicators. A description of the ports appears in the *Introduction* of this User's Guide (see *Features*, Chapter 1).

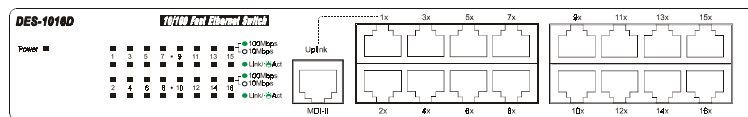


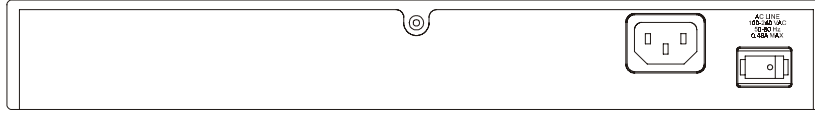
Figure 3.1 Front panel view of the 10/100 NWay Ethernet/Fast Ethernet Switch

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## Rear Panel

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The rear panel of the device consists of an AC power connector and a power switch.



**Figure 3.2 Rear panel view of the 10/100 NWay Ethernet/Fast Ethernet Switch**

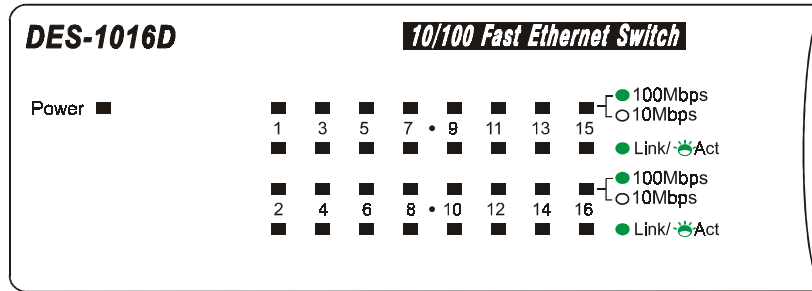
- ◆ **AC Power Connector** This is a three-pronged connector that supports the power cord. Plug in the female connector of the provided power cord into this connector, and the male into a power outlet. Supported input voltages range from 100 ~ 240 VAC at 50 ~ 60 Hz.
- ◆ **Power Switch** This turns the Switch on and off. To turn on the system, press the switch to the “1” position; to turn off, press the switch to the “0” position.

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## LED Indicators

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The LED indicators of the Switch include Power, 100Mbps/10Mbps, and Link/Act (Link/Activity). The LED indicators are used to facilitate monitoring and troubleshooting of the Switch. The following shows the LED indicators for the Switch along with an explanation of each indicator.



**Figure 3.3 The 10/100 NWay Ethernet/Fast Ethernet Switch LED indicators**

- ◆ **Power** This indicator operates when the Switch is turned on. If this indicator is not lit, check the AC power connector to ensure proper insertion of the power cord and that the power switch is turned ON.
- ◆ **100Mbps/10Mbps** The LED indicator lights when a 100 Mbps device is connected to a respective port or the uplink port. If a 10 Mbps device is connected to a respective port or the uplink port, the LED indicator is OFF.
- ◆ **Link/Act** These LED indicators are lit when there is a secure connection (or link) to a device at any of the ports. They remain dark if there is no link. The LED indicators blink whenever there is reception or transmission (i.e. Activity—Act) of data occurring at a port.

## 4

# CONNECTING THE SWITCH

This chapter describes how to connect the 10/100 NWay Ethernet/Fast Ethernet Switch to your Fast Ethernet network.

## Switch to PC

A PC can be connected to the Switch via a two-pair Category 3, 4, 5 UTP/STP straight cable (Cat. 3, 4, and 5 for 10M and Cat. 5 for 100M). The PC (equipped with a RJ-45 10/100 Mbps jack) should be connected to any of the sixteen ports (1x -16x).

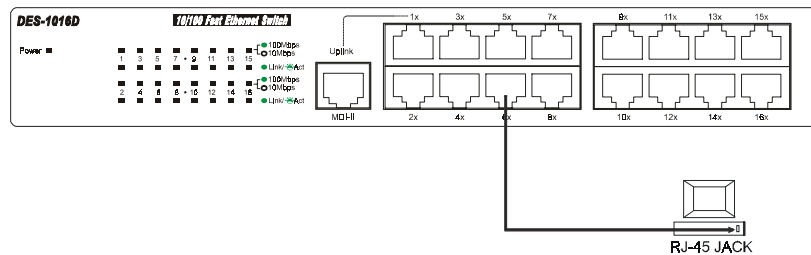


Figure 4.1 10/100 NWay Ethernet/Fast Ethernet Switch connected to a PC or Workstation

The LED indicators for PC connection are dependent on the LAN card capabilities. If LED indicators are not illuminated after making a proper connection, check the PC's LAN card, the cable, Switch conditions, and connections.

The following are LED indicator possibilities for a PC to Switch connection:

1. The 100Mbps LED indicator comes on for a 100 Mbps connection and stays off for 10 Mbps connection.
2. The Link/Act LED indicator illuminates upon hookup.

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## Switch to Hub (with Uplink)

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A hub (10 or 100BASE-TX) can be connected to the Switch via a two-pair Category 3, 4, 5 UTP/STP straight cable. The connection is accomplished from the hub's Uplink (MDI-II) port to any of the Switch's (MDI-X) ports.

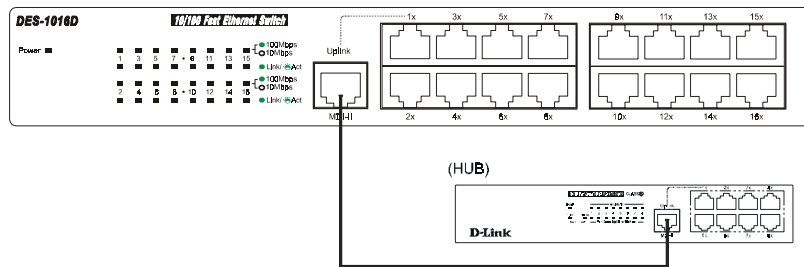


Figure 4.2 10/100 NWay Ethernet/Fast Ethernet Switch connected to a 10BASE-T or 100BASE-TX Hub

## **10BASE-T Hub**

For a 10BASE-T hub, the Switch's LED indicators should illuminate the following:

- ◆ 100Mbps LED speed indicator is OFF.
- ◆ Link/Act indicator is ON.

## **100BASE-TX Hub**

For a 100BASE-TX hub, the Switch's LED indicators should illuminate the following:

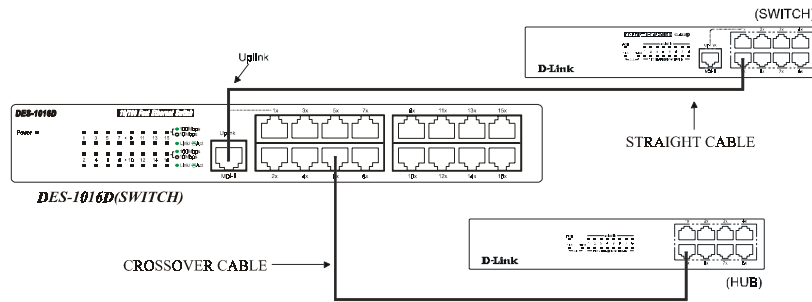
- ◆ 100Mbps LED speed indicator is ON.
- ◆ Link/Act is ON.

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## **Hub without Uplink (MDI-II) port**

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If a hub is not equipped with an Uplink (MDI-II) port, then a connection can be made using either straight cable or crossover cable (see *Appendix B, Pin Specification* for cable requirement).



**Figure 4.3 10/100 NWay Ethernet/Fast Ethernet Switch connected to a Hub without Uplink (MDI-II) port using the straight or crossover cable option**

### ***Using straight cable***

When using straight cable, the connection can be made from the Uplink (MDI-II) port of the Switch to any port of the Hub.

### ***Using crossover cable***

When using crossover cable, the connection can be made from any MDI-X ports of the Switch to any port of the Hub.





# TECHNICAL SPECIFICATIONS

General							
Standards:	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100 BASE-TX Fast Ethernet ANSI/IEEE std. 802.3 NWay auto-negotiation						
Protocol:	CSMA/CD Ethernet						
Data Transfer Rate:	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Ethernet:</td> <td style="width: 50%; border: none;">Fast Ethernet:</td> </tr> <tr> <td style="border: none;">10 Mbps (half duplex)</td> <td style="border: none;">100Mbps (half duplex)</td> </tr> <tr> <td style="border: none;">20 Mbps (full duplex)</td> <td style="border: none;">200Mbps (full duplex)</td> </tr> </table>	Ethernet:	Fast Ethernet:	10 Mbps (half duplex)	100Mbps (half duplex)	20 Mbps (full duplex)	200Mbps (full duplex)
Ethernet:	Fast Ethernet:						
10 Mbps (half duplex)	100Mbps (half duplex)						
20 Mbps (full duplex)	200Mbps (full duplex)						
Topology:	Star						
Network Cabling:	<p><b>10BASE-T:</b></p> 2-pair UTP Cat. 3,4,5 (100 m) EIA/TIA- 568 100-ohm STP (100 m)						
	<p><b>100BASE-TX:</b></p> 2-pair UTP Cat. 5 (100 m) EIA/TIA-568 100-ohm STP (100 m)						

<b>General</b>	
Number of Ports:	16 x 10BASE-T/100BASE-TX ports
Media Interface Exchange:	1 x MDI-II RJ-45 shared with port 1

<b>Physical and Environmental</b>	
AC inputs:	100 – 240 VAC, 50/60 Hz
Power Consumption:	24 watts maximum
Operating Temperature:	0 ° ~ 55 °C
Storage Temperature:	-25 ° ~ 55 °C
Humidity:	5% ~ 95% non-condensing
Dimensions:	324 x 231 x 44.5 mm (W x D x H)
Weight:	2.6 kg
EMI:	FCC Class A, VCCI Class A, BSMI Class A, CE Mark Class A, C-Tick Class A
Safety:	UL, CUL
<b>Performance</b>	
Transmission Methods:	Store-and-forward
RAM Buffer:	2M SGRAM per device

Packet Filtering/Forwarding Rate:	14,880 pps per port (for 10Mbps) 148,800 pps per port (for 100Mbps)
MAC Address Learning:	Up to 8K MAC address table

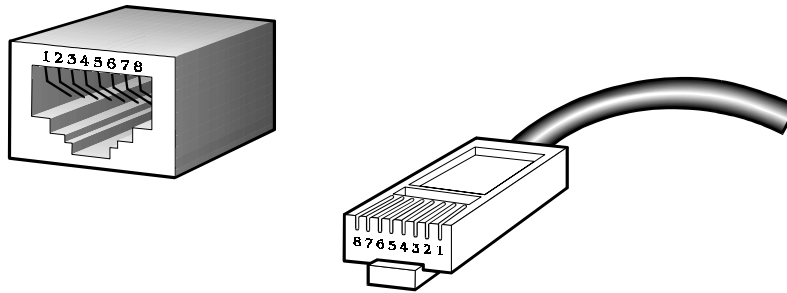


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## ***RJ-45 PIN SPECIFICATION***

When connecting the 10/100 NWay Ethernet/Fast Ethernet Switch to another switch, a bridge or a hub, a modified crossover cable is necessary. Please review these products for matching cable pin assignment.

The following diagram and tables show the standard RJ-45 receptacle/connector and their pin assignments for the switch-to-network adapter card connection, and the straight/crossover cable for the Switch-to-switch/hub/bridge connection.

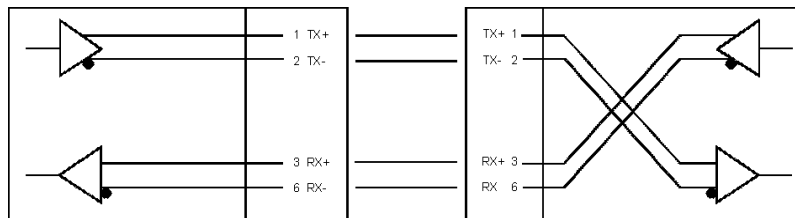


**The standard RJ-45 receptacle/connector**

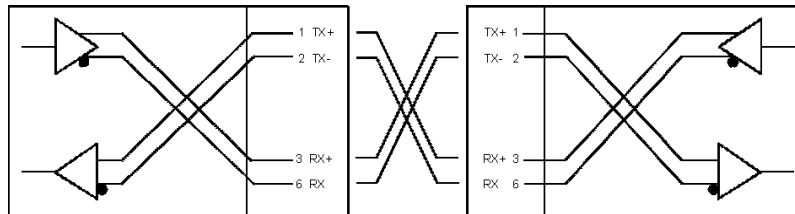
RJ-45 Connector pin assignment	
Contact	Media Direct Interface Signal
1	Tx + (transmit)
2	Tx - (transmit)
3	Rx + (receive)
4	Not used
5	Not used
6	Rx - (receive)
7	Not used
8	Not used

The standard Category 3 cable, RJ-45 pin assignment

The following shows straight cable and crossover cable connection:



Straight cable for Switch (Uplink MDI-II port) to switch/Hub or other devices connection



Crossover cable for Switch (MDI-X port) to switch/hub or other network devices (MDI-X port) connection



# D-Link® Offices

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# Registration Card

**Print, type or use block letters.**

Your name: Mr./Ms \_\_\_\_\_  
 Organization: \_\_\_\_\_ Dept. \_\_\_\_\_  
 Your title at organization: \_\_\_\_\_  
 Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Organization's full address: \_\_\_\_\_  
 \_\_\_\_\_  
 Country: \_\_\_\_\_  
 Date of purchase (Month/Day/Year): \_\_\_\_\_

Product Model	Product Serial No.	* Product installed in type of computer (e.g., Compaq 486)	* Product installed in computer serial No.

(\* Applies to adapters only)

**Product was purchased from:**

Reseller's name: \_\_\_\_\_  
 Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Reseller's full address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Answers to the following questions help us to support your product:**

1. **Where and how will the product primarily be used?**  
Home Office Travel Company Business Home Business Personal Use
2. **How many employees work at installation site?**  
1 employee 2-9 10-49 50-99 100-499 500-999 1000 or more
3. **What network protocol(s) does your organization use ?**  
XNS/IPX TCP/IP DECnet Others \_\_\_\_\_
4. **What network operating system(s) does your organization use ?**  
D-Link LANsmart Novell NetWare NetWare Lite SCO Unix/Xenix PC NFS 3Com 3+Open  
Banyan Vines DECnet Pathwork Windows NT Windows NTAS Windows '95  
Others \_\_\_\_\_
5. **What network management program does your organization use ?**  
D-View HP OpenView/Windows HP OpenView/Unix SunNet Manager Novell NMS  
NetView 6000 Others \_\_\_\_\_
6. **What network medium/media does your organization use ?**  
Fiber-optics Thick coax Ethernet Thin coax Ethernet 10BASE-T UTP/STP  
100BASE-TX 100BASE-T4 100VGAnyLAN Others \_\_\_\_\_
7. **What applications are used on your network?**  
Desktop publishing Spreadsheet Word processing CAD/CAM  
Database management Accounting Others \_\_\_\_\_
8. **What category best describes your company?**  
Aerospace Engineering Education Finance Hospital Legal Insurance/Real Estate Manufacturing  
Retail/Chainstore/Wholesale Government Transportation/Utilities/Communication VAR  
System house/company Other \_\_\_\_\_
9. **Would you recommend your D-Link product to a friend?**  
Yes No Don't know yet
10. **Your comments on this product?**  
 \_\_\_\_\_  
 \_\_\_\_\_



PLEASE  
PLACE STAMP  
HERE

**TO:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**D-Link®**