D-Link®

DES-1008D
10/100 Dual-Speed Ethernet/Fast Ethernet Switch
User's Guide

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RECYCLABLE

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Wichtige Sicherheitshinweise

1. Bitte lesen Sie sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den spätern Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Vervenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Um eine Beschädigung des Gerätes zu vermeiden sollten Sie nur Zubehörteile verwenden, die vom Hersteller zugelassen sind.
5. Das Gerät is vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sichern Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen. Verwenden Sie nur sichere Standorte und beachten Sie die Aufstellhinweise des Herstellers.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
9. Die Netzanschlußsteckdose muß aus Gründen der elektrischen Sicherheit einen Schutzleiterkontakt haben.
10. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollete auch nichts auf der Leitung abgestellt werden.
11. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
12. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
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14. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.
15. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
    a – Netzkabel oder Netzstecker sint beschädigt.
    b – Flüssigkeit ist in das Gerät eingedrungen.
    c – Das Gerät war Feuchtigkeit ausgesetzt.
    d – Wenn das Gerät nicht der Bedienungsanleitung ensprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
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18. Zum Netzanschluß dieses Gerätes ist eine geprüfte Leitung zu verwenden, Für einen Nennstrom bis 6A und einem Gerätegewicht gr ßer 3kg ist eine Leitung nicht leichter als H05VV-F, 3G, 0.75mm2 einzusetzen.

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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 this user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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TABLE OF CONTENTS

ABOUT THIS GUIDE

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

Purpose

This manual provides detailed specifications and discusses how to install your DES-1008D Dual-speed Switch.

Conventions

For simplicity, the term '*switch*' refers to all Dual-speed, Ethernet or Fast Ethernet switches, including the DES-1008D. The model number is used only to explain features specific to the DES-1008D switch.

Overview of this User's Guide

- 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 DES-1008D to your Ethernet/Fast Ethernet network.
- Appendix A, *Technical Specifications*. Lists the technical (general, physical and environmental, and performance) specifications of the switch.
- Appendix B, *Cables and Connectors*. Describes the RJ-45 receptacle/connector and the straight and crossover cable connector.

1

INTRODUCTION

This section describes the features of the DES-1008D, and gives some background information about Ethernet/Fast Ethernet switching technology.

Dual-Speed Ethernet Technology

The growing importance of LANs and the increasing complexity of desktop computing applications are fueling the need for higher performance networks. A number of high-speed network technologies have been proposed to provide greater bandwidth and improve client/server response times. Among them, Fast Ethernet, or 100Base-T, provides a non-disruptive and smooth evolution from the current 10Base-T Ethernet technology.

Fast Ethernet is a new standard specified by the IEEE 802.3 LAN committee. It is an extension of the 10 Mbps Ethernet standard with the ability to transmit and receive data at 100 Mbps, while maintaining the CSMA/CD Ethernet protocol. Since 100 Mbps Fast Ethernet is compatible with 10 Mbps Ethernet environments, it provides a straightforward upgrade and takes advantage of the company's existing investment in hardware, software, and personnel training.

One of the biggest advantages of Fast Ethernet over other high speed networking solutions is the ability of existing 10 Mbps Ethernet networks to be gradually upgraded; network performance can be improved by adding Fast Ethernet components only when and where needed. This cost-efficient migration strategy is realized through dual-speed devices which can operate at either 10 Mbps or 100 Mbps, depending on the speed of the device it is connected to.

Fast, efficient and relatively inexpensive dual-speed devices are made possible because there is no need to translate between Ethernet and Fast Ethernet protocols. This allows for much lower latencies (making your network faster), and easy installation, especially if the devices use NWay Auto-Negotiation technology.

NWay is implemented on a port-by-port basis on dual-speed devices. If NWay is implemented on a port it will automatically sense the connection speed (10 or 100 Mbps) and duplex mode (full or half) of any device connected to that port. NWay will establish the connection at the highest speed attainable by both devices and will use full duplex transmission if both devices have this capability.

Your DES-1008D has 8 ports, all of which are dual-speed, capable of full/half duplex operation and NWay enabled. All Ethernet and Fast Ethernet devices connected to the switch will be able to intercommunicate.

Switching Technology

Switches can increase network performance by:

- Eliminating network bottlenecks.
- Increasing data throughput (also called *aggregate bandwidth*) to support more traffic.
- Providing high-speed, dedicated (collision-free) data paths for network backbones and servers.
- Extending Fast Ethernet networks beyond the intrinsic two repeater, 205 meter network diameter limits.
- In the case of dual-speed switches, connecting 10 Mbps Ethernet networks with 100 Mbps Fast Ethernet networks.

In general, a switch receives incoming data packets, temporarily stores them, then forwards the packets out the switch port that leads to the destination. Unlike a hub, which receives a signal from one port and repeats it to all other ports, a switch is selective as to which port will receive the data being sent, involving only two ports of the switch (the source and destination ports).

The CSMA/CD medium access scheme which Ethernet and Fast Ethernet are based on requires all stations connected to the network to compete for use of the wires. If one station is transmitting data, the data is broadcast (by hubs) throughout the network and during this time, no other station can transmit. If a station tries to transmit at the same time as another, a collision will occur, both stations data will be destroyed and the stations will wait for a random period before trying to retransmit the data again.

Eliminating Network Bottlenecks

Collisions are a normal occurrence when using Ethernet and they don't usually have a noticeable affect on overall network performance. However, when too many stations are competing for use of the network, collision rates can become very high and network performance can be affected. Degraded performance is characterized by long delay times, usually the result of high collision rates in certain components or network segments. These congested areas are called bottlenecks.

An area of the network where collisions can occur is called a *collision domain* or *segment*. Switches, by their very nature are outside collision domains; each port on a switch is a separate collision domain, and stations connected to different ports on a switch reside in different collision domains. A switch allows high-speed, collision-free communication between the collision domains connected to it.

If, for example, eight Ethernet stations are connected to an Ethernet hub, they share the 10 Mbps Ethernet bandwidth. This results in an average bandwidth per station of 1.25 Mbps. If the same eight stations are connected to an Ethernet switch, each station has 10 Mbps of dedicated, collision-free bandwidth. Since collisions cannot occur, traffic is sure to flow between the connected segments.

Eliminating network bottlenecks involves identifying the major sources of network traffic (network servers for example) and giving them their own Fast Ethernet and/or switched connections. Also, switches can be used to divide collision domains containing many users into smaller, less populated segments, thus distributing the network load and reducing competition for the wire.

Increasing Network Bandwidth

A switch is capable of receiving and forwarding transmissions for more than one port at the same time. In the case of half-duplex ports which can either send or receive data, the switch can handle transmissions from up to half of its ports (since the other half are presumably receiving). In the case of full-duplex ports which can send and receive at the same time, the switch can handle simultaneous transmissions from all of its ports.

When a switch is handling two transmissions simultaneously, it actually increases the bandwidth of the network. If, for example, a switch is simultaneously transferring data from two 100 Mbps ports to two other ports, the switch is handling 200 Mbps of traffic. The switch has effectively doubled the overall network capacity. If the ports are using full-duplex connections and the receiving ports are simultaneously transmitting, then the switch is handling 400 Mbps of data, doubling the overall network bandwidth once again. A switch that can process simultaneous full-duplex traffic from all of its ports is able to operate at *full wire speed*. The total amount of traffic a switch can handle is called the *aggregate bandwidth*.

This multiplication of network bandwidth allows high-speed, collision-free communications between different network segments that are interconnected through the switch.

High-speed Backbones and Servers

The ability of switches to support high-bandwidth, full-duplex, collision-free connections makes them perfect for interconnecting network segments, in other words, operating as the backbone of the network. Full-duplex Fast Ethernet switch to switch connections operate at 200 Mbps. Network servers (or any other computer) using full-duplex Fast Ethernet NIC's can also have a 200 Mbps collision-free connection to the network.

Since bottlenecks most commonly occur in the backbone and servers, installing a switch to service these areas can greatly increase the speed of a network without having to replace other network components such as the servers themselves, hubs, client NIC's, etc.

Extending Fast Ethernet Networks

Due to the increased speed in Fast Ethernet and adherence to the IEEE 802.3u specifications, the network diameter of 100BASE-TX collision domains is limited to 205 meters; in contrast, the maximum 10BASE-T Ethernet collision domain can be up to 500 meters in diameter. Likewise, Fast Ethernet can only support two repeaters (hubs or hub stacks) in a collision domain while Ethernet supports up to four.

As discussed earlier, switches are not subject to collision domain restrictions. Connections to switches are only subject to the 100 meter limit placed on lengths of twisted-pair cabling. Thus, Fast Ethernet or dual-speed switches can be used at one or both ends of a Fast Ethernet collision domain and more Fast Ethernet devices can be connected to the network through the switch.

The new devices connected through the switch will be able to communicate with everyone on the network, but will not be part of the original collision domain. This condition is actually beneficial, since traffic on one segment will not pass through the switch to any other segment unless its destination lies in that direction. This selective forwarding feature leaves segments connected through the switch free of unnecessary traffic.

10 Mbps to 100 Mbps Switching

Dual-speed Ethernet/Fast Ethernet switches seamlessly link 10Base-T Ethernet segments with 100Base-TX Fast Ethernet

segments. NWay enabled ports are automatically configured, making these connections even easier.

This conversion feature inherent in dual-speed switches allows for gradual migrations to Fast Ethernet allowing older Ethernet stations to communicate with newer Fast Ethernet devices and vice-versa.

DES-1008D Dual-Speed Switch

Performance Features

- Eight UTP/STP ports. All ports are 10/100 Mbps dual-speed, NWay enabled Full/Half duplex.
- Uplink (MDI-II) port for straight-through connections to another switch, hub or repeater.
- Store and forward switching scheme ensures data integrity.
- Auto-polarity feature corrects reversed polarity on the transmit and receive twisted-pairs for each port.
- 100% full wire speed data forwarding for 100 Mbps Fast Ethernet (148,800 pps) and 10 Mbps Ethernet (14,880 pps) on all ports.
- 1.6 gigabit per second aggregate bandwidth supports Full-duplex Fast Ethernet connections on every port.
- Data filtering eliminates all bad packets (CRC Align errors, runts, fragments, etc.) at 100% wire-speed for all ports.
- Half-duplex collision-based back-pressure jamming and Full-duplex IEEE 802.3x flow control enabled.

- 1K active MAC address table with self learning and table aging.
- 1 MB memory with dynamic port buffering reduces lost packets.

2

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the DES-1008D 10/100 Dual-speed Switch.

Unpacking

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

- One DES-1008D 10/100 Dual-speed Switch
- One AC power adapter
- One AC power cord
- This User's Guide
- Four rubber feet with adhesive backing
- Wall mount kit, consisting of two tapping screws and two nylon anchors

If any item is found missing or damaged, please contact your local D-Link Reseller for replacement.

Setup

The site where you install the DES-1008D Switch may greatly affect its performance. Please follow these guidelines for setting up the switch.

- Install the switch on a sturdy, level surface that can support at least 2 kg of weight. Do not place heavy objects on the switch.
- The power outlet should be within 1.82 meters (6 feet) of the switch.
- Visually inspect the power adapter cord and see that it is fully secured to the DC power port.
- Make sure that there is proper heat dissipation from and adequate ventilation around the switch. Leave at least 10 cm of space at the front and rear of the switch for ventilation.
- Install the switch in a fairly cool and dry place. See Appendix A, Technical Specifications, for the acceptable temperature and humidity operating ranges.
- Install the switch in a site free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.
- When installing the switch on a level surface, attach the rubber feet to the bottom of the device. The rubber feet cushion the switch, protect the casing from scratches and prevent it from scratching other surfaces.

Desktop or Shelf Installation

When installing the switch on a desktop or shelf, the rubber feet included with the switch should first be attached. Attach these cushioning feet on the bottom at each corner of the device. Allow enough ventilation space between the switch and any other objects in the vicinity.

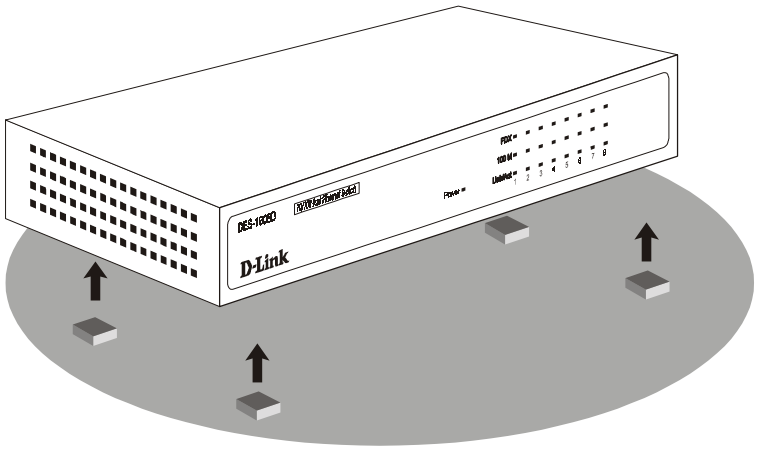


Figure 2.1 DES-1008D Dual-speed Switch installed on a Desktop or Shelf

Wall Installation

The DES-1008D comes complete with a wall mount kit. This kit includes two screws and two plastic anchors. For a proper placement on the wall, follow these steps:

- Select a site that is free of obstructions from other equipment or devices. Consider the following points for site selection:
  - ◊ The Switch should be placed high enough where LED indicators can be observed and cable and power connections can be made.
  - ◊ Moreover, decide whether you would like the switch to point with the front panel facing either up or down.
- Drill two holes into the wall with the same distance as the screw support holes located on the bottom of the switch. Do not drill these holes too deep.
- Insert the nylon anchors into the holes in the wall and imbed them with gentle taps of a hammer.
- Screw in the screws provided with the wall mount kit into the plastic anchors. Do not insert the screws with excessive torque. The screw's head and with a small portion of the screw's body should be sticking out.
- Gently, place the switch onto the wall with the front panel facing up or down by sliding the screws into the provided slots.
- Make all power and network connections at this time (for more information see Chapter 4, *Connecting the Switch*).

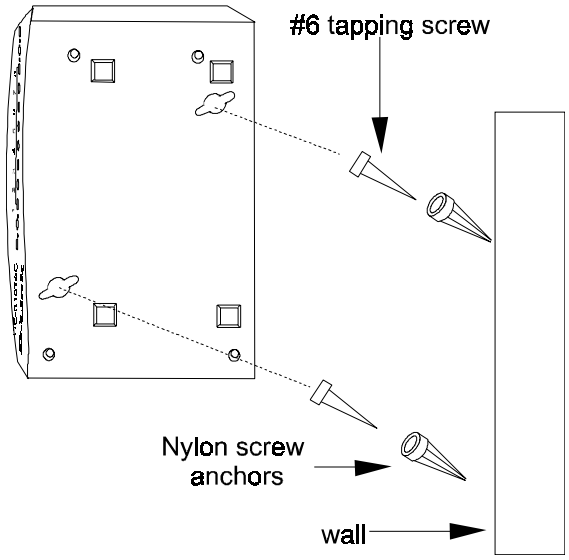


Figure 2.2 Wall Mounting the DES-1008D Switch

Power on

The DES-1008D Switch comes with a AC/DC power converter for sources of 90 - 230 VAC, 50 - 60 Hz. To turn the switch on, plug one end of the power adapter cord into the DC power connector of the switch and the other end into the local power source outlet. The power adapter will adjust to the local power source automatically and may be turned on before having any 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 foreseeable power failure. Disconnect the power cord from the local power source. When power is resumed, plug the switch back in to turn the switch **ON**. At all times, avoid leaving the switch ON in anticipation of a power failure.

3

IDENTIFYING EXTERNAL COMPONENTS

This chapter describes the front, rear, side panels and LED indicators of the switch.

Front Panel

The front panel consists of the LED indicators of the switch: Power, 100M, Link/Act and FDX. The LED indicators are used to facilitate monitoring and troubleshooting.

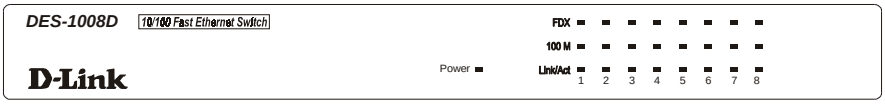


Figure 3.1 Front panel view of the DES-1008D Switch

Rear and Side Panels

The rear panel of the DES-1008D consists an DC power connector, 8 (10/100 Mbps MDI-X) ports, and 1 Uplink (MDI-II) port (shared with port 1x). A description of the ports appear in the *Introduction* of this User's Guide (see *Features*, Chapter 1).

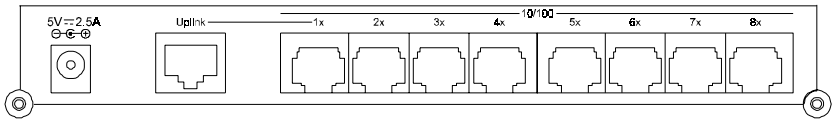


Figure 3.2 Rear panel view of the DES-1008D switch

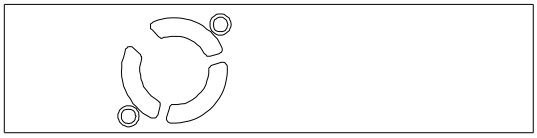


Figure 3.3 Side panel view of the DES-1008D switch

- **AC Power Adapter.** This is a two-pronged external power adapter that transforms AC current from the power outlet to DC current to supply the switch. Plug in the female connector of the provided power cord into this connector, and the male into a power outlet. Supported input voltages for the power adapter range from 90 ~ 230 VAC at 50 ~ 60 Hz. The switch requires 5 VDC / 2.5 Amp.

LED Indicators

The LED indicators of the switch include Power, Speed, Link/Activity and Duplex Mode. 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.

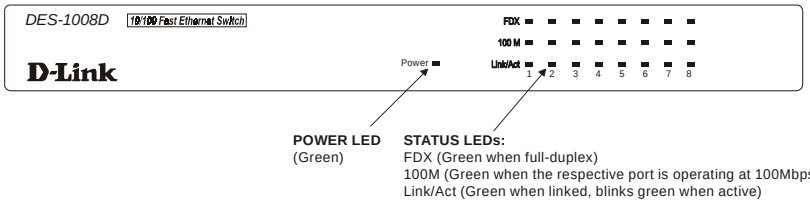


Figure 3.4 The DES-1008D Switch LED indicators

- **Power** This indicator lights ***green*** when the switch is receiving power; otherwise, it is OFF. If this indicator is not lit, check the DC power connector and wall jack to ensure proper insertion of the power cord.

- **10/100** The LED indicator lights ***green*** when a 100 Mbps device is connected to a port or the uplink port. If a 10 Mbps device is connected to a port or the uplink port, the LED indicator is OFF.

- **Link/Act** These LED indicators are lighted up **green** when there is a secure connection (or link) to a device at the analogous port. The LED indicators blink **green** whenever there is reception or transmission (activity) of data occurring at a port.

- **FDX** This LED indicator is ***green*** when a port is in full duplex (FDX) mode and it is OFF for half duplex (HDX)

operations. It blinks when collisions are occurring on the respective port.

4

CONNECTING THE SWITCH

This chapter describes how to connect the DES-1008D switch to your Ethernet/Fast Ethernet network.

Cables

- The EIA/TIA 568 Wiring Standard imposes a 100 meter limit on horizontal runs of twisted-pair cables; in this case, from the switch to any other device.
- 10 Mbps Ethernet connections must use Category 3 or better twisted-pair cabling fitted with RJ-45 connectors.
- 100 Mbps Fast Ethernet connections must use shielded twisted pair (STP) or Category 5 or better unshielded twisted-pair (UTP) cables fitted with Category 5 RJ-45 connectors.
- Cat 5 UTP cables use the same RJ-45 connector used with 10BASE-T, wired in the same configuration. Please note that the punch-down blocks in the wiring closet must also be Category 5 certified. Where these

blocks do not meet this standard, an upgrade is necessary.

We recommend using Category 5 cabling for all connections in order to make it easier to transition all stations to 100 Mbps.

Different connection schemes require different types of cable. Please use the following chart when choosing cables:

DEVICE	PORT USED	DEVICE BEING CONNECTED	PORT TYPE	CABLE TO USE
Switch	Normal	Hub or Switch	Normal	Crossover (X)
			Uplink	Straight-Through (||)
		Server (or PC)		Straight-Through (||)
	Uplink	Hub or Switch	Normal	Straight-Through (||)
			Uplink	Crossover (X)
		Server (or PC)		Crossover (X)

A crossover cable is a normal straight-through twisted-pair cable in which the wires have been crossed at one end. Please refer to *Appendix B: Cables and Connectors* for more detailed information about crossover cables.

PC to Switch

A PC can be directly connected to the switch, giving the PC a high-bandwidth dedicated connection to the network. The PC must first be fitted with a 10BASE-T Ethernet, 100 BASE-TX Fast Ethernet or 10/100 dual-speed network interface card (NIC) with an RJ-45 jack for twisted-pair connections. In the case of 10BASE-T, the PC can be connected using a Category 3, 4 or 5 UTP/STP straight cable; a 10/100 dual-speed or 100BASE-TX connection needs

Category 5 or better UTP/STP. The PC can be connected to any of the eight ports (labeled 1x - 8x). The power to the switch and the PC can be ON while the connection is being made. Once connected, the NWay feature discussed in Chapter 1 will automatically configure the connection for optimal performance. These settings are displayed on the LED indicators on the front panel of the switch.

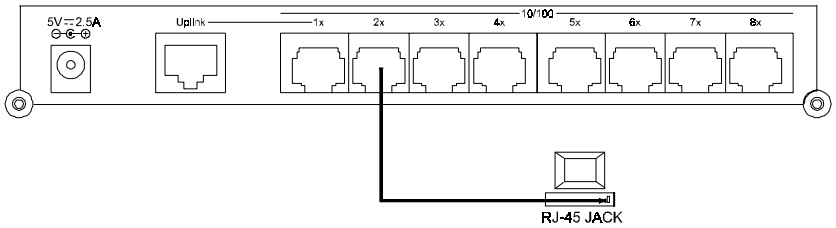


Figure 4.1 PC or Workstation connected to a DES-1008D Switch

The LED indicators for PC connection are dependent on the LAN card (NIC) capabilities. If no LED indicators are illuminated after connecting the cable, 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 port's corresponding **100M** indicator (LED) lights for a 100 Mbps link and stays dark for 10 Mbps.
2. The **Link/Act** LED indicator illuminates upon hookup.
3. The **FDX** LED indicator lights for full-duplex, remains dark for a half-duplex link, and blinks when collisions take place.

Hub to Switch

One or more 10BASE-T, 10/100 dual-speed or 100Base-TX hubs can be connected to the DES-1008D Dual-speed Switch via a two-pair Category 3, 4, 5 UTP/STP straight cable (the same used to connect a computer). In the case of a 10 Mbps Ethernet hub, a Category 3, 4 or 5 UTP/STP cable can be used; a 10/100 dual-speed or 100 Mbps Fast Ethernet hub needs to use Category 5 or better UTP/STP.

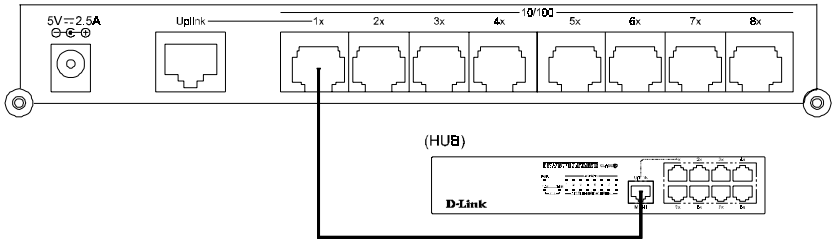


Figure 4.2 DES-1008D Switch connected to a 10 or 100Base-TX Hub

NOTE: *The first twisted-pair port (Port 1x) is shared with the Uplink port. If you connect a hub to the Uplink port, then do not use Port 1x (and vice-versa).* ***Never have devices connected to the Uplink port and Port 1x at the same time.***

Using a straight cable

The connection shown above uses a normal straight-through cable to connect the switch's normal twisted-pair (MDI-X) port 1x to the hub's Uplink (MDI-II) port. Though Port 1x on the switch was chosen for the example, any of the non-Uplink normal twisted-pair

ports (labeled 1x - 8x) on the switch can be used. Alternatively, a straight cable can be used to connect the Uplink (MDI-II) port on the switch to any one of the non-Uplink (MDI-X) twisted-pair ports on the hub.

Please note that a straight-through cable is always used when connecting an MDI-X port to an MDI-II port.

Using a crossover cable

If a connection must be made between the Uplink port (MDI-II) on the switch and the Uplink port (MDI-II) on the hub, then a crossover cable must be used. Using a crossover cable is also necessary when connecting a normal twisted-pair port (MDI-X) on the switch to a normal twisted-pair (MDI-X) port on the hub. More detailed information about making and using crossover cables can be found in *Appendix B: Cables and Connectors*.

Please note that a crossover cable must be used whenever connecting an MDI-II port to an MDI-II port or when connecting an MDI-X port to an MDI-X port.

10BASE-T Hubs

For a 10 Base-TX (only) hub, the switch's LED indicators should illuminate as follows:

- **100M** indicator is OFF.
- **Link/Act** indicator is *ON*.
- **FDX** indicator is OFF.

10/100 Dual-speed and 100Base-TX Hubs

For 10/100 Dual-speed and 100Base-TX hubs, the switch's LED indicators should illuminate as follows:

- **100M** indicator is *ON*.
- **Link/Act** is *ON*.
- **FDX** LED indicator is OFF.

Switch to Switch (or other devices)

The DES-1008D Dual-speed Switch can be connected to another switch or other devices (routers, bridges, etc.) via a two-pair Category 3, 4, 5 UTP/STP straight or crossover cable. When connecting the DES-1008D to a 10 Mbps (only) Ethernet device, a Category 3, 4 or 5 UTP/STP cable can be used; a connection to a 10/100 dual-speed or 100 Mbps Fast Ethernet device needs to use Category 5 or better UTP/STP.

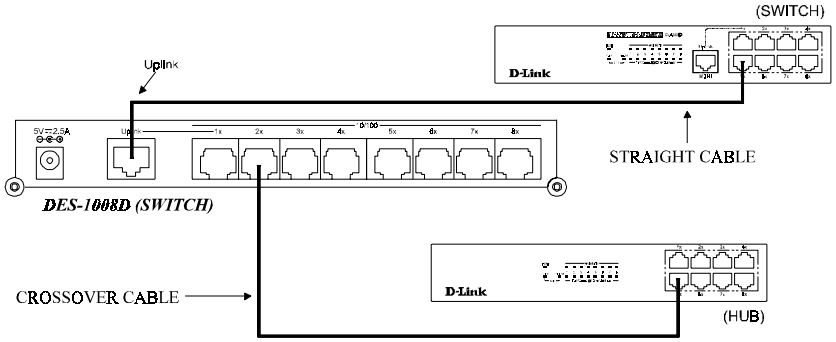


Figure 4.3 DES-1008D Uplink connections using straight and crossover cables.

NOTE: *The first twisted-pair port (Port 1x) is shared with the Uplink port. If you connect a device to the Uplink port, then do not use Port 1x (and vice-versa).* ***Never have devices connected to the Uplink port and Port 1x at the same time.***

Using a straight cable

The connection shown above uses a normal straight-through cable to connect the Uplink (MDI-II) port on the DES-1008D switch to one of the non-Uplink (MDI-X) twisted-pair ports on the other switch. Alternatively, a straight cable can be used to connect one of the switch's normal twisted-pair (MDI-X) ports to another device's Uplink (MDI-II) port.

Please note that a straight-through cable is always used when connecting an MDI-X port to an MDI-II port.

Using a crossover cable

The connection shown above uses a crossover cable to connect Port 2x, a normal twisted-pair (MDI-X) port on the DES-1008D switch, to one of the non-Uplink (MDI-X) twisted-pair ports on the hub. A crossover cable must also be used when a connection must be made between the Uplink port (MDI-II) on the switch and the Uplink port (MDI-II) on the device being connected. More detailed information about making and using crossover cables can be found in *Appendix B: Cables and Connectors*.

Please note that a crossover cable must be used whenever connecting an MDI-II port to an MDI-II port or when connecting an MDI-X port to an MDI-X port.

The LED indicators on the DES-1008D switch for the respective connected ports are as follows:

1. The **100M** indicator (LED) lights for a 100 Mbps link and stays dark for 10 Mbps.
2. The **Link/Act** LED indicator illuminates upon hookup.
3. The **FDX** LED indicator lights for full-duplex, remains dark for a half-duplex link, and blinks when collisions take place.

A

TECHNICAL SPECIFICATIONS

General		
Standards:	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100BASE-TX Fast Ethernet ANSI/IEEE Std 802.3 NWay auto-negotiation	
Protocol:	CSMA/CD	
Data Transfer Rate:	Ethernet: 10 Mbps (half duplex) 20 Mbps (full duplex)	Fast Ethernet: 100Mbps (half duplex) 200Mbps (full duplex)
Topology:	Star	
Network Cables: 10BaseT: 100Base-TX:	 2-pair UTP Category 3,4,5 (100 m) EIA/TIA- 568 100-ohm STP (100 m) 2-pair UTP Cat. 5 (100 m) EIA/TIA-568 100-ohm STP (100 m)	
Number of Ports:	8 x 10/100 Mbps MDI-X ports	
Media Interface Exchange:	MDI-II RJ-45 shared with port 1x	

Physical and Environmental	
DC inputs: Power Adapter:	5 VDC, 2.5 Amp 90 - 230 VAC, 50/60 Hz (external universal power supply)
Power Consumption:	8 watts maximum
Operating Temperature:	32 ° ~ 131 °F (0 ° ~ 55 °C)
Storage Temperature:	13 ° ~ 131 °F (-25 ° ~ 55 °C)
Humidity:	5% ~ 95% non-condensing
Dimensions:	197x115x28 mm (1U)
Weight:	1.5 Kg
EMI:	CE Class A , C-Tick Class A , FCC Class A , VCCI Class A, BSMI Class A .
Safety:	UL (UL 1950), CSA (CSA950), TUV/GS (EN60950)

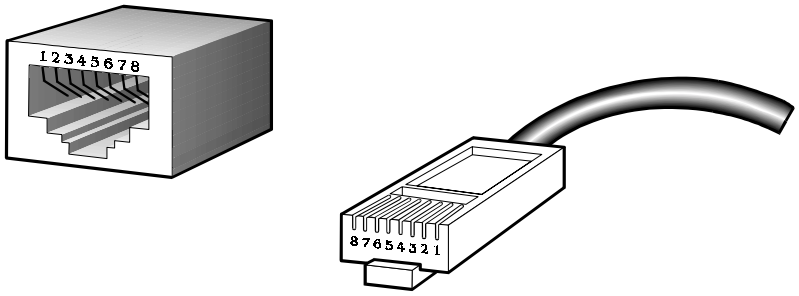
Performance	
Transmission Method:	Store-and-forward
RAM Buffer:	1 MB per device
MAC Address Table:	1 Kb entries per device
Packet Filtering/Forwarding Rate:	148,800 pps per port (for 100Mbps) 14,880 pps per port (for 10Mbps)
MAC Address Learning:	Automatic update Max age: fixed

B

CABLES AND CONNECTORS

When connecting the switch to another switch, bridge or hub, a crossover cable may be necessary.

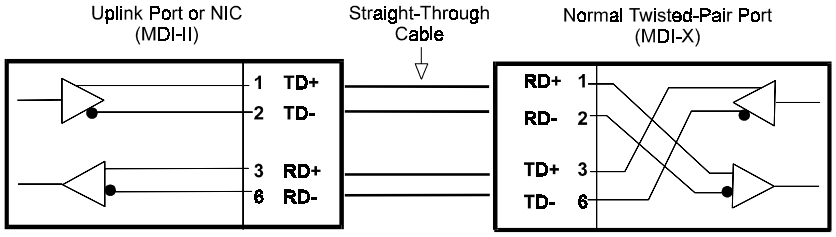
The following diagrams and tables show the standard RJ-45 receptacle/connector and their pin assignments.



The standard RJ-45 port and connector

RJ-45 Pin Assignments		
Contact	**MDI-X Port**	**MDI-II Port**
1	RD+ (receive)	TD+ (transmit)
2	RD- (receive)	TD- (transmit)
3	TD+ (transmit)	RD+ (receive)
4	Not used	Not used
5	Not used	Not used
6	TD- (transmit)	RD- (receive)
7	Not used	Not used
8	Not used	Not used

The standard RJ-45 pin assignments

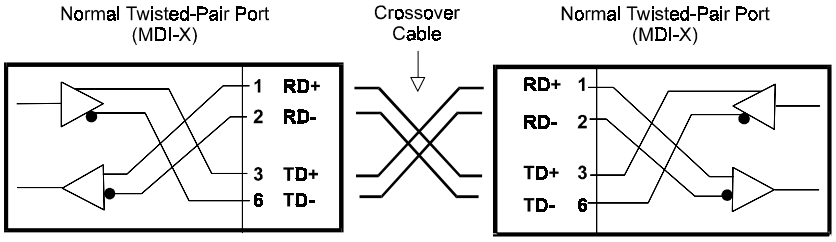


Straight cable for use with MDI-II to MDI-X connections

With a crossover cable, two pairs of wires are switched at one connector end. Carry out the following steps to create a customized, crossover twisted-pair cable:

1. Leave one end of the cable as is, with the RJ-45 connector intact. The wiring at just one end of the cable needs to be modified.

2. At the other end of the cable, connect wires 1 and 2 to contacts 3 and 6, respectively. Likewise, connect wires 3 and 6 to contacts 1 and 2. Refer to the following diagram:



Crossover cable for use with MDI-X to MDI-X and/or MDI-II to MDI-II connections

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Your title at organization: _____
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Organization's full address: _____
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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: _____
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Reseller's full address: _____
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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_____

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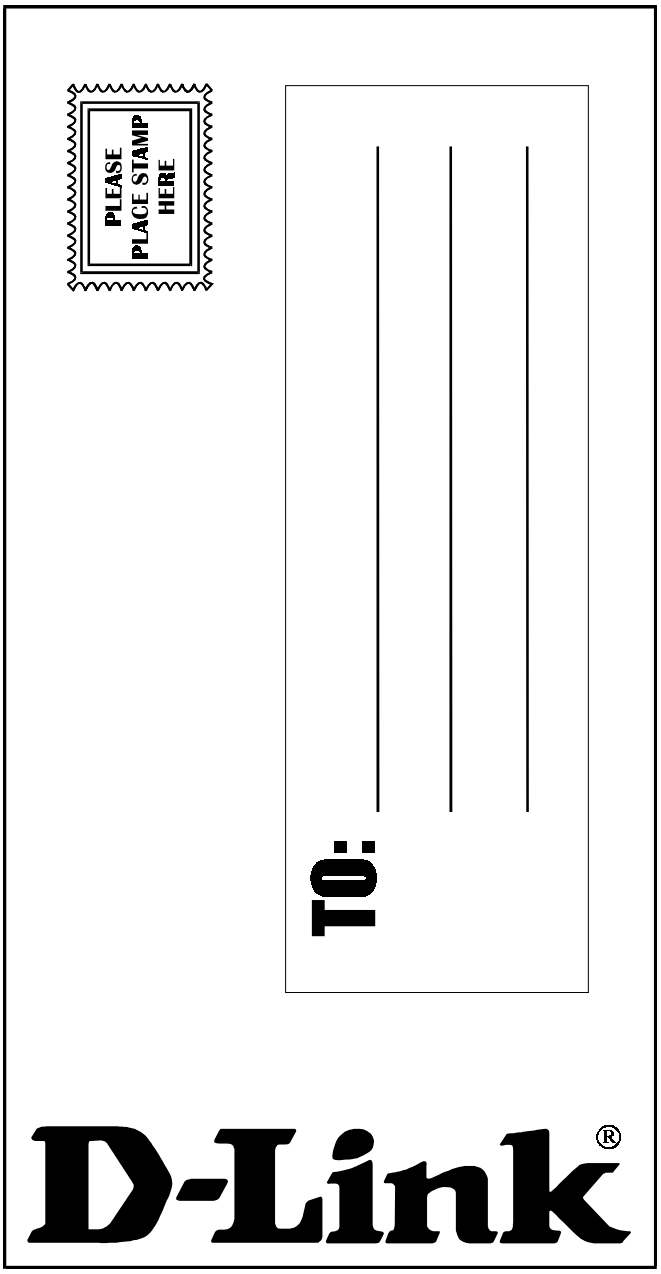
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