

DES-1012

10/100 Fast Ethernet Switch

User's Guide

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RECYCLABLE

Wichtige Sicherheitshinweise

1. Bitte lesen Sie sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den spätem 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.
4. Um eine Beschädigung des Gerätes zu vermeiden sollten Sie nur Zubehörteile verwenden, die vom Hersteller zugelassen sind.
5. Das Gerät ist 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 sollte 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.
13. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. Elektrischen Schlag auslösen.
14. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem 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 sind beschädigt.
 - b – Flüssigkeit ist in das Gerät eingedrungen.
 - c – Das Gerät war Feuchtigkeit ausgesetzt.
 - d – Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
 - e – Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
 - f – Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
16. Bei Reparaturen dürfen nur Originalersatzteile bzw. den Originalteilen entsprechende Teile verwendet werden. Der Einsatz von ungeeigneten Ersatzteilen kann eine weitere Beschädigung hervorrufen.
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<u>Product Type</u>	<u>Warranty Period</u>
Complete products	One year
Spare parts and spare kits	90 days

Your dealer, or your nearest D-Link office, can advise whether a longer period of warranty applies to your purchase, and if so, can provide you a separate certificate of supplemental warranty.

The one-year period of warranty on complete products (or such longer period of warranty as may be offered as to your purchase) applies on condition that the product's Registration Card is filled out and returned to a D-Link office within ninety (90) days of purchase. A list of D-Link offices is provided at the back of this manual, together with a copy of the Registration Card. Failing such timely registration of purchase, the warranty period shall be limited to ninety (90) days.

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FCC Warning

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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ABOUT THIS GUIDE

Congratulations on your purchase of DES-1012 Fast Ethernet Switch. This device integrates 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible desktop package.

Purpose

This manual discusses how to install your DES-1012 Fast Ethernet Switch.

Terms/Usage

For simplicity, this documentation uses the terms “Switch” (first letter upper case) to refer to your DES-1012 Fast Ethernet Switch, and “switch” (first letter lower case) to refer to all Ethernet switches, including your DES-1012.

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 your 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.
- ◆ Appendix C, Describes the DES-112FX 100BASE-FX Module Specifications.

1

INTRODUCTION

This section describes the features of the DES-1012, as well as giving some background information about Ethernet and Fast Ethernet switching technology.

Fast Ethernet Technology

The growing importance of LANs and the increasing complexity of desktop computing applications are fueling the need for high performance networks. A number of high-speed LAN 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, smooth evolution from the current 10Base-T technology. The non-disruptive and smooth evolution nature, and the dominating potential market base, virtually guarantee cost effective and high performance Fast Ethernet solutions in the years to come.

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

Switching Technology

Another approach to pushing beyond the limits of Ethernet technology is the development of switching technology. A switch bridge's Ethernet packets at the MAC address level of the Ethernet protocol transmitting among connected Ethernet or Fast Ethernet LAN segments.

Switching is a cost-effective way of increasing the total network capacity available to users on a local area network. A switch increases capacity and decreases network loading by making it possible for a local area network to be divided into different *segments* which don't compete with each other for network transmission capacity, giving a decreased load on each.

The switch acts as a high-speed selective bridge between the individual segments. The switch, without interfering with any other segments automatically forwards traffic that needs to go from one segment to another. This allows the total network capacity to be multiplied, while still maintaining the same network cabling and adapter cards.

For Fast Ethernet networks, a switch is an effective way of eliminating problems of chaining hubs beyond the two-repeater limit." A switch can be used to split parts of the network into different collision domains, making it possible to expand your Fast Ethernet network beyond the 205-meter network diameter limit for 100BASE-TX networks. Switches supporting both traditional 10Mbps Ethernet and 100Mbps Fast Ethernet are also ideal for bridging between existing 10Mbps networks and new 100Mbps networks.

Switching LAN technology is a marked improvement over the previous generation of network bridges, which were characterized by higher latencies. Routers have also been used to segment local area networks, but the cost of a router and the setup and maintenance required make routers relatively impractical. Today switches are an ideal solution to most kinds of local area network congestion problems.

Features

The Switch is designed for easy installation and high performance in an environment where traffic on the network and the number of users increase continuously.

The Switch with its rack size is specifically designed for network workgroups. The Switch provides immediate access to a rapidly growing network through a wide range of user-reliable functions.

The Switch is ideal for deployment with multiple high-speed servers for shared bandwidth 10Mbps or 100Mbps workgroups. In 200Mbps full-duplex mode, any port can provide workstations with a congestion-free data pipe for simultaneous access to the server.

The Switch is expandable by cascading two or more switches together. As all ports support 200Mbps full duplex, the Switch can be cascaded from any port and to any number of switches.

The Switch is a perfect choice for site planning to upgrade to Fast Ethernet in the future. Ethernet workgroups can connect to the Switch now, and change adapters and hubs anytime later without needing to change the Switch or reconfigure the network.

The Switch combines dynamic memory allocation with store-and-forward switching to ensure that the buffer is effectively allocated for each port, while controlling the data flow between the transmit and receive nodes to guarantee against all possible packet loss.

Other key features are:

- ◆ Twelve N-Way UTP/STP ports all come with auto-negotiation and operate at 10/100 Mbps for connection to servers and hubs. All ports can be configured for full or half-duplex operation.
- ◆ Uplink/MDI-II (media dependent interface) port for uplinking to another switch, hub or repeater. Please note that if you are using the

uplink port, you will not be able to use port one (1x) because these ports are logically connected.

Performance Features

- 10/100Mbps Auto-Negotiation and Auto-Sensing on All Ports
- Full/half duplex operation for each port
- 1.3 Gbps Switching Fabric, Provides Wire-Speed Performance on All Ports
- Parallel Store-and-forward Architecture Provides High-Speed Switching scheme
- LEDs for Easy Recognition of the Switch Operating Status
- Optional DMA Port for a 100BASE-FX SC type module (paired with Port 12)
- Console Port for easy Troubleshooting and Management
- Complete Frame Checking & Error Filtering

2

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the Switches.

Unpacking

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

- ◆ One DES-1012 Fast Ethernet Switch
- ◆ One AC power cord
- ◆ This *User's Guide*
- ◆ Four rubber feet with adhesive backing
- ◆ Six screws and two L-type brackets for rack mounting

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

Setup

Consider the following when setting up the Switch:

- ◆ The power outlet should be within 1.82 meters 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.

Rack Installation

The Switch can be mounted in an EIA standard size, 19-inch rack, which can be placed in a wiring closet with other equipment. To install, attach the mounting brackets on the switch's front panel (one on each side) and secure them with the screws provided.

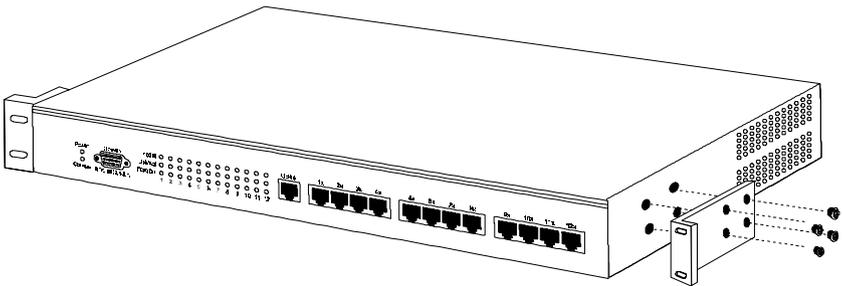


Figure 1A, Attaching the mounting brackets to the Switch

Then, use the screws provided with the equipment rack to mount the Switch in the rack.

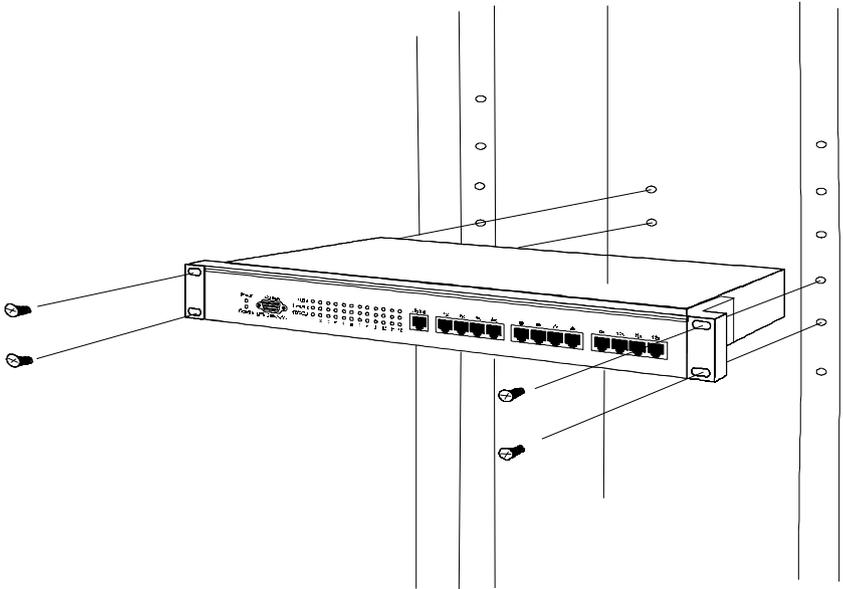


Figure 1B, Installing the Switch in an equipment rack

Power On

The Switch can be used with AC power sources 100 to 240 VAC, 50 to 60 Hz. The power switch is located at the rear of the unit adjacent to the AC power connector and the system fan. 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:

- ◆ The power LED indicator will be *green*.

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** after the occurrence of a power failure.

3

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 12 (10/100 Mbps MDI-X) ports, one Uplink (MDI-II) port and LED indicators. Descriptions of the ports appear in the *Introduction* of this User's Guide.

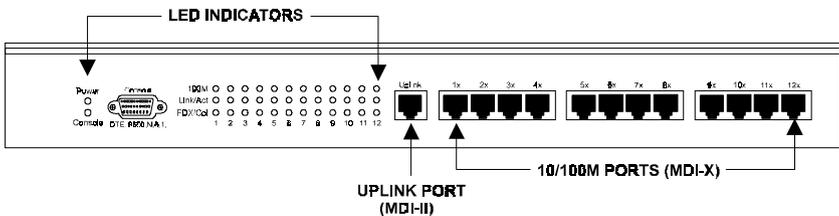


Figure2, Front panel view of the Switch

Rear Panel

The rear panel of the Switch consists of a power switch, an AC power connector, a system fan, a location for slide-in module, and a duplex-mode Dip switch.

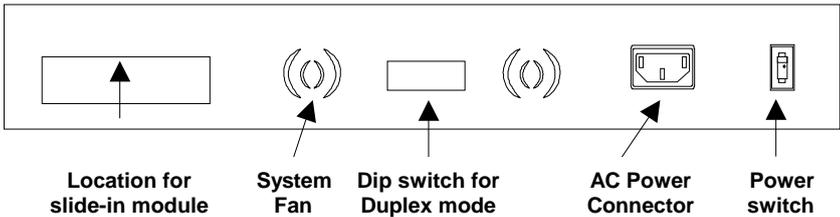


Figure 3, Rear panel view of the Switch

- ◆ **Slide-in Module Slot.** Use this slot to install a optional 100Base-FX(SC type) DES-112FX slide-in module. The module can be used to provide a high speed link to the rest of your network. The detail specification of this module please see Appendix C. And when the slide-in module is fitted, port 12 automatically switches to become the slide-in module port.
- ◆ **System Fan.** This fan is used to circulate air inside the Switch and also to dissipate heat. The sides of the system also provide heat vents to serve the same purpose. Do not block these openings, and leave adequate space at the rear and sides of the Switch for proper ventilation. Be reminded that without proper heat dissipation and air circulation, system components might overheat, which could lead to system failure.
- ◆ **Dip Switch.** Use this Dip switch to set the duplex mode. Each port in the DES-1012 can be set for half duplex or full duplex mode. To set a port in full duplex mode, slide the corresponding switch **up**. To set it in half duplex mode, slide the corresponding switch **down**.
- ◆ **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.

LED Indicators

The LED indicators of the Switch include Power, 100 M, Link/Act (Link/Activity) and FDX/Col (Full-duplex/Collision). 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.

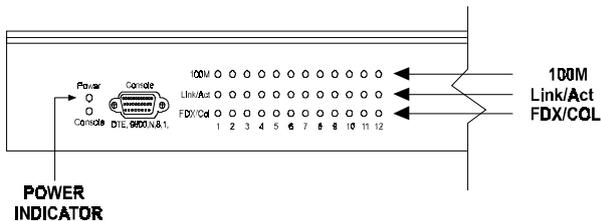


Figure 4, The Switch LED indicators

- ◆ **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.
- ◆ **100M.** The LED indicator lights *green* 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 lighted up *green* when there is a secure connection (or link) to a device at any of the ports. The LED

indicators blink *green* whenever there is reception or transmission (i.e. Activity act) of data occurring at a port.

- ◆ **FDX/Col.** This LED indicator is *green* when a respective port is in full duplex (FDX) mode. Otherwise, it is OFF for half duplex (HDX) operations. It blinks *yellow* when collisions are occurring on the respective port.
- ◆ **Console.** This LED indicator is green when RS-232 link is present.

4

CONNECTING THE SWITCH

This chapter describes how to connect the DES-1012 to your Fast Ethernet network.

PC to Switch

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

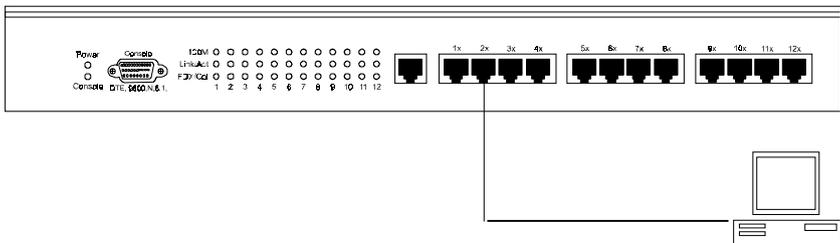


Figure5, The Switch connected to a PC or Workstation

The LED indicators for a PC connection are dependent on the LAN card capabilities. If the LEDs are not illuminated after making a proper

connection, check the PC LAN card, the cable, switch conditions and connections.

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

1. The 100M LED indicator comes on for a 100 Mbps and stays off for 10 Mbps.
2. The Link/Act LED indicator illuminates upon hookup.
3. The FDX/Col LED indicator depends upon LAN card capabilities.

Hub to Switch

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 uplink (MDI-II) port to any of the Switch (MDI-X) ports.

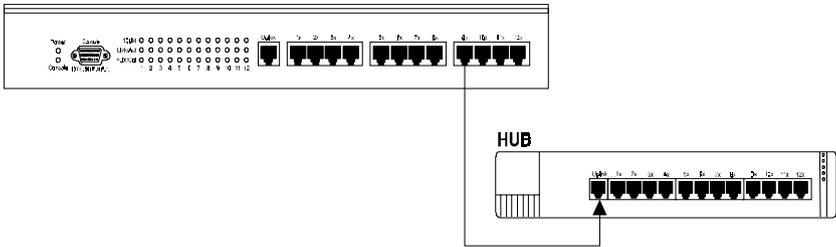


Figure 6, Switch connected to a 10Base-T or 100Base-TX Hub

10Base-T Hub

For a 10 Base-T hub, the Switch LED indicators should illuminate as follows:

- ◆ 100M LED speed indicator is *OFF*.

- ◆ Link/Act indicator is *ON*.
- ◆ FDX/Col indicator is OFF.

100Base-TX Hub

For a 100Base-TX hub, the Switch LED indicators should illuminate as follows:

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

Hub Without Uplink (MDI-II) Port

If a hub is not equipped with an uplink (MDI-II) port, then a connection can be made using either a straight cable or a crossover cable (see *Appendix A, Technical Specifications* for cable requirements).

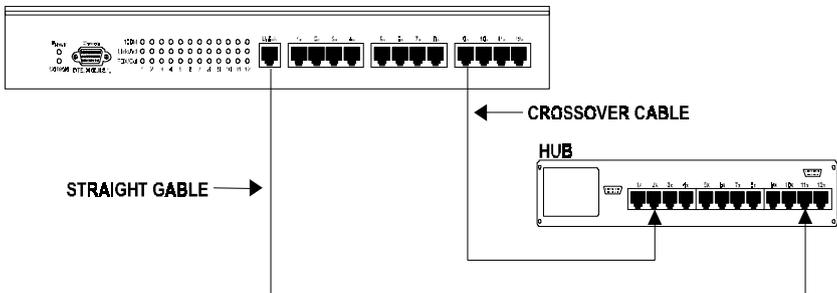


Figure 7, The Switch connected to a Hub without an uplink (MDI-II) port using the Straight or crossover cable option

Using a 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 (see figure 7).

Using a Crossover Cable

When using crossover cable, the connection can be made from any port of the Switch to any port of the Hub (see figure 7).

Configuring the Port Speed & Duplex Mode

After plugging the selected cable to a specific port, you can configure the communication mode through console program (Auto Negotiation Enable/disable, Port Speed) and Dip switch (Half/Full Duplex) on the rear panel of the Switch:

1. If you have auto-negotiation disabled, an auto-sensing process is initiated to select the speed, and the duplex mode will be set based on the Dip switch setting.
2. If you have auto-negotiation enabled, but the partner does not support auto-negotiation. Then an auto-sensing process is initiated to select the speed, and the duplex mode is set based on the Dip switch setting.
3. If auto-negotiation is supported and enabled on both ends of the connection and Dip switch is set to half-duplex (HDX), Dip switch **down**, the auto-negotiation process is initiated to negotiate for one of the following modes:
 - 100Mbps/HDX
 - 10Mbps/HDX
4. If auto-negotiation is supported and enabled on both ends of the connection and Dip switch is set to full-duplex (FDX), Dip switch **up**,

the auto-negotiation process is initiated to negotiate for one of the following modes:

- 100Mbps/FDX
- 100Mbps/HDX
- 10Mbps/FDX
- 10Mbps/HDX

NOTE: The default communication mode of the Switch is: auto-negotiation (On), and HDX (Dip switch down) .

Switch to Switch (Other Devices)

DES-1012 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.

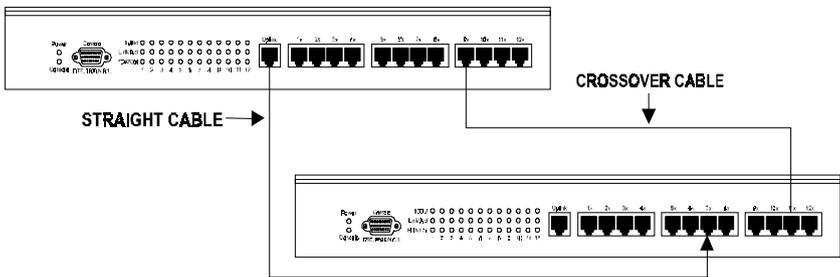


Figure 8, A Switch to switch connection using the straight or crossover cable options.

Using a Straight Cable

When using a straight cable, this is done from the uplink (MDI-II) port of the Switch (Switch A) to any of the 10Mbps or 100Mbps (MDI-X) port of the other switch (switch B) or other devices (see figure 8).

Using a Crossover Cable

When using crossover cable, this is done from any (MDI-X) port of the Switch (Switch A) to any of the 10Mbps or 100Mbps (MDI-X) port of the other switch (switch B) or other devices (see figure 8).

Switch A's LED indicators for the respective connected ports are as follows:

- ◆ 100 M is ON for 100Base-TX, otherwise it is OFF.
- ◆ Link/Act is ON.
- ◆ FDX/Cool depends on the connected switch or other device.

Console Management Program

This section discusses how to manage the DES-1012 using the console management program. It describes the steps required to set up a console device and details how to configure the console program.

Overview

The console program allows you to manage the DES-1012 and monitor its performance. You have to access this program through a direct connection between a management console and the console port of the DES-1012. The management console used for the connection can be a VT-100 terminal or a PC running terminal emulation software.

Setting Up a Console Device

To set up the connection, follow these steps:

1. Connect a terminal or a PC with terminal emulation software to the console port using the RS-232 cable.
2. The console port on the management module is a DTE DB-9 connector. You need a null adapter installed between the cable and the console port.

3. Set your terminal to the following setting:
 - Baud—9600
 - Parity- None
 - Data Bits—8
 - Stop Bit—1
4. Turn on the DES-1012. When you enter the main screen of the terminal, press the <Enter> or <Esc> key once to start communication. If the connection is successful, the console program Main Menu will appear on the screen.

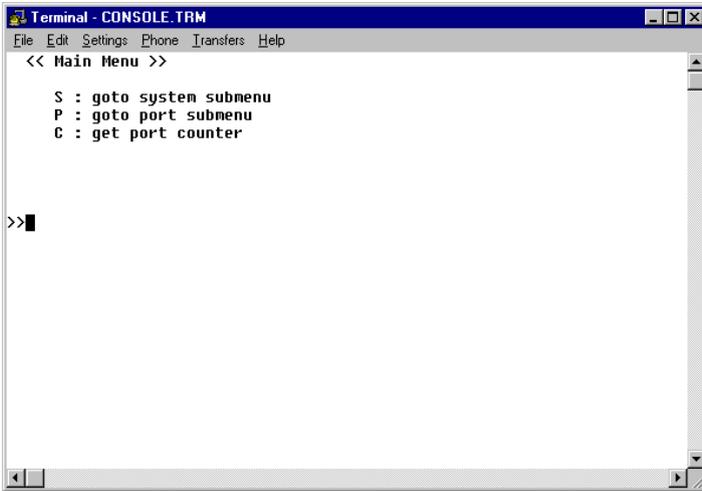


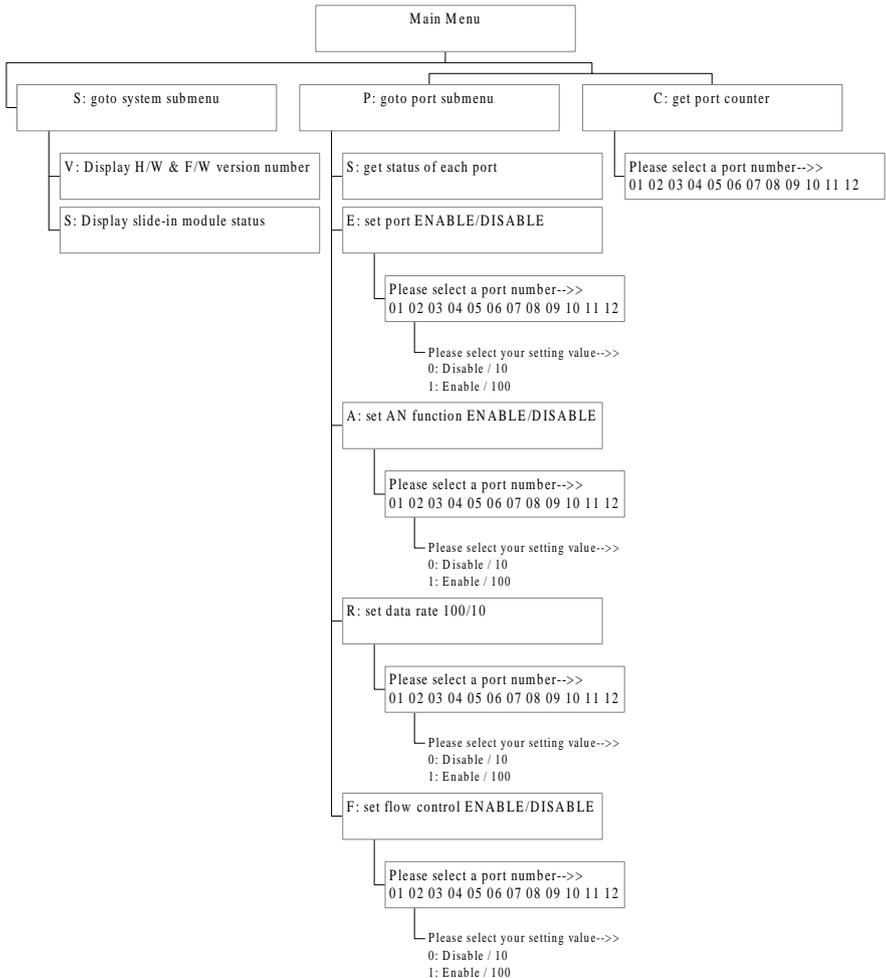
Figure 9, The Console Program Main Menu

Navigating the Console Program Screens

To Do This	Use This Key . . .
Move to the submenu	First character of each option line
Select a specific port	Corresponding port: 01 02 03 04 05 06 07 08 09 10 11 12

Disable a function or select 10Mbps	0
Enable a function or select 100Mbps	1
Go back to the main menu	Esc or Enter

While following steps in these sections, you may find the screen map below



useful:

Figure 10, The Console Program Screen Map

The following example illustrates how to disable or enable the AN function for Port 1:

1. Press **P** from the Main Menu to access the Port Submenu.
2. Press **A** in the port submenu to access the set AN function ENABLE/DISABLE screen.
3. Press **01** to access Port 1.
4. Press **0** to disable the AN function or press **1** to enable the AN function.
5. Press <Esc> or <Enter> to go back to the main menu.

Configuring the Console

The options available from the Main Menu are:

S : goto system submenu

P : goto port submenu

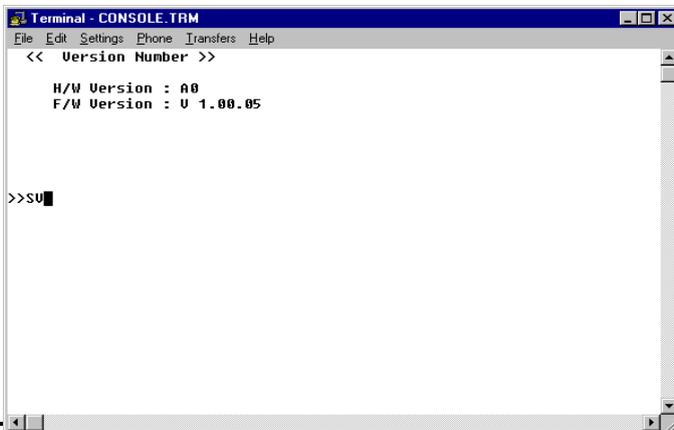
C : get port counter

System Submenu

With the System Submenu, you can perform the following:

V: **Display the Hardware and Firmware version numbers.** This is a view-only screen showing the hardware and software version of the switch.

Figure 11, Version Number Screen



S: Display slide-in module status. This indicates the status of the slide-in module. If there is no module installed, the field will read, slide-in module is Absent.” If there is a module installed, this field will display the type of slide-in module.

NOTE: When a slide-in module is fitted, port 12 automatically switches to become the slide-in module port.

Port Submenu

With the Port Submenu, you can perform the following:

S: Get status of each port. This is a view-only screen, which indicates the current status and settings of the ports. The following screen displays port status and factory settings.

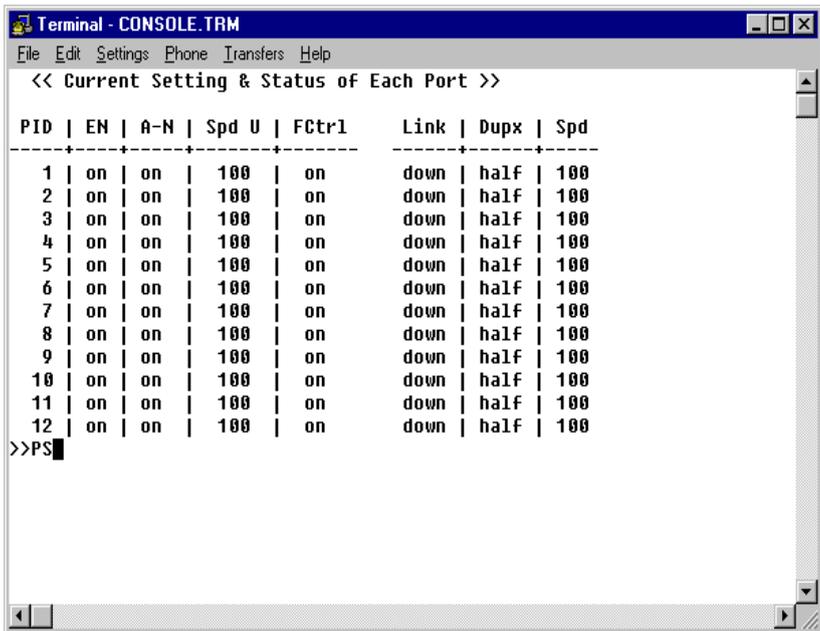


Figure 12, Port Status List

NOTE: To perform a factory reset, turn the device off. Power on the device again and the factory settings should now be in effect.

Parameters in this screen are described in the following table.

Field	Description
PID	Displays the number of the currently selected port.
EN	Displays the RX/TX status of the selected port, Enable or Disable.
Link	Displays the current status of the link between the selected port and the connected node. This can be Up or Down.
AN	Displays the Auto Negotiation function status of the selected port. This can be On or Off.
Spd	Displays the Port Speed associated with duplex mode. This can be 10(10M/HDX), 20(10M/FCX), 100(100M/HDX), or 200 (100M/FDX).
Dupx	<p>Displays the Duplex mode of the selected port. This can be Full or Half Duplex mode. Full duplex transmissions effectively double your bandwidth by carrying out transmission and receipt of packets at the same time.</p> <p>Each port in the 12-port NWay switch can be set for half duplex or full duplex mode. You need to set the Duplex mode through the Dip switch at the rear of the device. To set a port in full-duplex mode, slide the corresponding switch up. To set it in half-duplex mode, slide the corresponding switch down.</p> <p>To make full duplex mode work properly, make sure both ends of the link are configured to full duplex mode.</p>
FCtrl	Displays Flow Control status of the selected port. This can be On or Off.
Spd U	Displays User Set Port Speed. This can be 10 or 100Mbps.

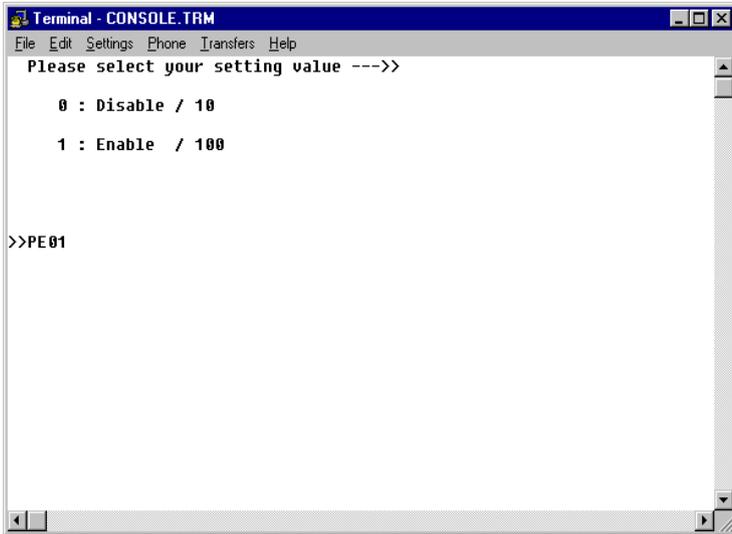


Figure 13, Set port ENABLE/DISABLE

Because the following four functions have the similar screens that let you specify. Displayed here is the screen for E: set port ENABLE/DISABLE.

E: Set port ENABLE/DISABLE. This is the operating status of the port. Use this screen to enable or disable the selected port. A disabled port does not transmit any packets to the connected segment, nor forward any received packets.

A: Set the AN function ENABLE/DISABLE. This is the Auto Negotiation status for the port. Use this screen to enable or disable the Auto Negotiation function for the port.

R: Set the data rate 10/100. This is the current connection speed specified for the port. Use this screen to set the speed of a port. Port speed can be either 10Mbps or 100Mbps.

F: Set flow control ENABLE/DISABLE. This is the Flow Control status for the port. Use this screen to enable or disable Flow Control for the port. Flow Control minimizes dropped packets by sending out collision signals when the

port receiving buffer is full. Press 0 to disable flow control and press 1 to set data rate as 100Mbps.

NOTE: Flow control is only available in half-duplex mode. In full-duplex mode, flow control is not available. The port status & setting list indicates only the setting configured for flow control rather than the status of flow control.

Port Counter

With the Port Counter, you can do the following:

C: Monitor statistics related to the traffic status of each port.

The screen below is the Port 2 counter.

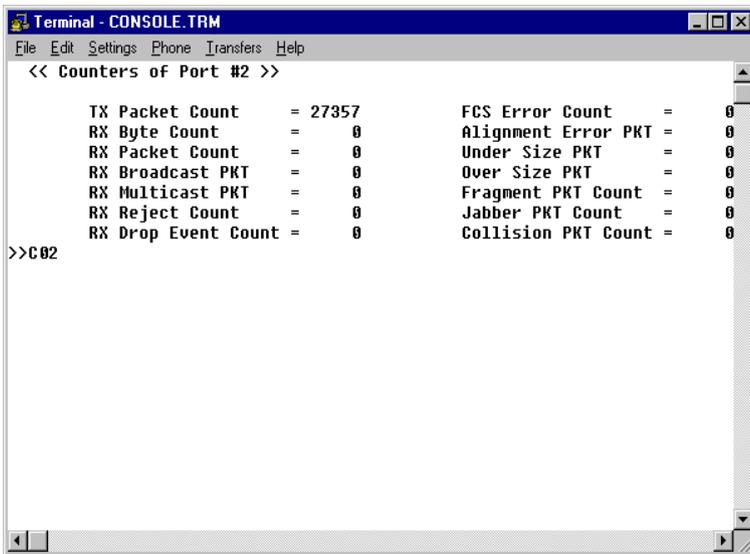


Figure 14, Counters for Port 2

NOTE: Any changes you make to a specific port will clear the counters of that port and return that port counter to the default settings.

Parameters in this screen are described in the following table.

Field	Description
TX Packet Count	The number of packets that have been transmitted successfully by the selected port. Packets are from 64-1518 bytes, including the CRC.
RX Byte Count	The size, in bytes, of all packets received and forwarded successfully by the selected port.
RX Packet Count	The number of packets that have been received successfully on the selected port.
RX Broadcast PKT	The number of broadcast packets that are received.
RX Multicast PKT	The number of multicast packets that are received.
RX Reject Count	The number of discarded packets that are received on the selected port. These frames are discarded at the receiving port because of frame filtering.
RX Drop Event Count	The number of lost packets received on the selected port. Lost packets result from the lack of internal receive buffer space.
FCS Error Count	The number of packets with cyclic redundancy check (CRC) errors that are received on the selected port.
Alignment Error PKT	The number of alignment errors received on the selected port. An alignment error occurs when a received packet is not an integral number of bytes.
Under Size PKT	The number of packets received that were well formed but less than 64 bytes long.
Over Size PKT	The number of packets received that were well formed but greater than 1,518 bytes long.
Fragment PKT Count	The number of packets received that were less than 64 bytes long and had either a CRC error or an alignment error.

Jabber PKT Count	The number of packets received that were greater than 1,518 bytes long and had either a CRC error or an alignment error.
Collision PKT Count	The number of collisions that occurred on the segment connected to the selected port.



TECHNICAL SPECIFICATIONS

General		
Standards:	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100 Base-TX/FX Fast Ethernet ANSI/IEEE Std 802.3 NWay auto-negotiation IEEE 802.3 Frame types: Transparent IEEE 802.3 MAC layer frame size: 64 - 1518 Bytes	
Protocol:	CSMA/CD	
Data Transfer Rate:	Ethernet: 10Mbps (half duplex) 20Mbps (full duplex)	Fast Ethernet: 100Mbps (half duplex) 200Mbps (full duplex)
Topology:	Star	

General (continued)	
Network Cables:	<p>10BaseT:</p> <p>2-pair UTP Cat. 3,4,5 (100 m)</p> <p>EIA/TIA- 568 100-ohm STP (100 m)</p> <p>100Base-TX:</p> <p>2-pair UTP Cat. 5 (100 m)</p> <p>EIA/TIA-568 100-ohm STP (100 m)</p>
Number of Ports:	12 x 10/100Mbps ports
Media Interface Exchange:	MDI-II RJ-45 shared with port 1x

Physical and Environmental	
AC inputs:	100 - 240 VAC, 50/60 Hz (internal universal power supply)
Power Consumption:	40 watts maximum
DC fans:	1 built-in 40x40 mm fan
Operating Temperature:	32° ~ 122° F (0° ~ 50° C)
Storage Temperature:	-22° ~ 140° F (-30° ~ 60° C)

Humidity:	5% ~ 95% non-condensing
Dimensions:	442x258x44 mm (1U)
Weight:	2.5 Kg
EMI:	FCC Class A, CE Mark Class A, VCCI Class A
Safety:	UL (UL 1950), CSA (CSA950), TUV/GS (EN60950)

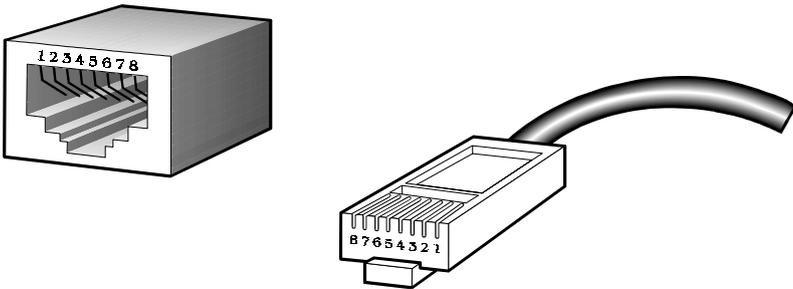
Performance	
Transmission Method:	Store-and-forward
RAM Buffer:	128K bytes per port
Filtering Address Table:	4K entries per port
Packet Filtering/Forwarding Rate:	14,880 bps per port (for 10Mbps) 148,800 bps per port (for 100Mbps)
MAC Address Learning:	Automatic update



RJ-45 PIN SPECIFICATION

When connecting your 10/100 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.

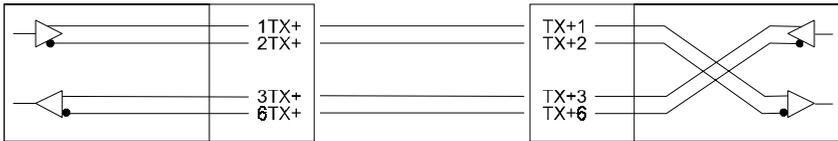


The standard RJ-45 receptacle/connector

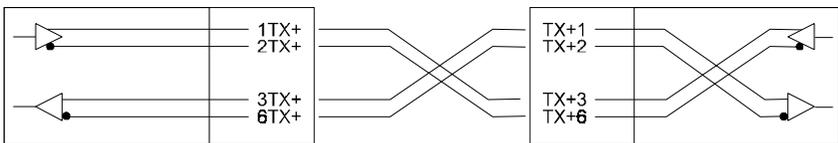
RJ-45 Connector pin assignment	
Contact	Media Direct Interface Signal
1	Tx + (transmit)
2	Tx - (transmit)
3	Rx + (receive)
4	Not used
5	Not used
6	Rx - (receive)
7	Not used
8	Not used

The standard Category 3 cable, RJ-45 pin assignments

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



OPTIONAL 100BASE-FX MODULE

The 100BASE-FX specification requires the fiberoptic cabling which is more expensive than the conventional UTP cabling. However, it has a definite appeal to widespread LANs where cost of wiring is less important than the distance it delivers to Ethernet LANs-400 meters for half-duplex segments and 2 kilometers for full-duplex segments.

The 100BASE-FX port requires one pair of 62.5/125 micron fiber-optic cable. It services distance of up to 400 meters and supports full or half-duplex operation. It is an ideal solution for backbone connections.

How to Install the DES-112FX 100BASE-FX module

- ◆ Unplug power code.
- ◆ Unscrew and remove the cover slot from the real panel of the DES-1012.
- ◆ Slide-in and securely screw the 100BASE-FX module into the open slot of the DES-1012.
- ◆ Attach the Fiber Optic cable to the 100BASE-FX module.

10/100 Fast Ethernet Switch User's Guide

U.S.A.	D-LINK SYSTEMS, INC. 5 Musick Irvine, CA 92618 USA TEL: 1-714-455-1688 FAX: 1-714-455-2521
CANADA	D-LINK CANADA, INC. 2180 Dunwin Drive, Unit # 6, Mississauga Ontario, L5L 5M8, Canada TEL: 1-905-828-0260 FAX: 1-905-828-5669
U.K.	D-LINK (EUROPE) LTD. D-Link House, 6 Garland Road, Stanmore, London HA7 1DP U.K. TEL: 44-181-235-5555 FAX: 44-181-235-5500
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SWEDEN	D-LINK A/B World Trade Center P. O. Box 70396, 107 24 Stockholm Sweden TEL: 46-8-700.62.11 FAX: 46-8-21.96.40
DENMARK	D-LINK DENMARK Naverland 2 DK-2600 Glostrup Copenhagen, Denmark TEL: 45-43-96.90.40 FAX: 45-43-42.43.47
SINGAPORE	D-LINK SINGAPORE PTE.LTD. 77 Science Park Drive #03-03 CINTech III, Singapore Science Park Singapore 118256 TEL : 65-774-6233 FAX: 65-774-6322
AUSTRALIA	D-LINK AUSTRALIA PTY.LTD. Unit 16, 390 Eastern Valley Way Roseville, NSW 2069 Australia TEL: 61-2-9417-7100 FAX: 61-2-9417-1077
CHINA	D-LINK BEIJING 15th Floor, Science and Technology Tower No. 11, Baishiqiao Road, Haidian District, Beijing 100081 China TEL: 86-10-68467106/68467107/68467108/68467109 FAX: 86-10-68467110
JAPAN	D-LINK TOKYO 5F, 3-9-1 Togoshi, Shinagawa-ku Tokyo 142 Japan TEL: 81-3-5751-2351 FAX: 81-3-5751-2352
INDIA	D-LINK (INDIA) PVT. LTD. Plot No.5, Kurla-Bandra Complex Rd. Off Cst Rd., Santacruz (E) Bombay - 400 098 India TEL: 91-22-611-2788/617-2478-80/611-2948 FAX: 91-22-611-3503/617-2476
TAIWAN	D-LINK TAIWAN 2F, No.233-2 Pao-Chiao Rd, Hsin-Tien, Taipei, Taiwan, R.O.C. TEL: 886-2-916-1600 FAX: 886-2-914-6299

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?



TO: _____

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