

D-Link®

DES-1005D
5-port 10/100Mbps
Dual Speed Ethernet Switch
User' s Guide

Rev. 02 (OCT. 1999)

6012-9830016
Printed In Taiwan



RECYCLABLE

FCC Certifications

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded interface cables must be used in order to comply with emission limits.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2)

This device must accept any interference received, including interference that may cause undesired operation.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

VCCI Warning

注意

この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づく第一種情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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Product Type	Warranty Period
Product (excluding power supplies and fans), if purchased and delivered in the fifty (50) United States, or the District of Columbia ("USA")	As long as the original purchaser still owns the product
Product purchased or delivered outside the USA	One (1) Year
Power Supplies and Fans	One (1) Year
Spare parts and spare kits	Ninety (90) days

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Products that have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed;

Initial installation, installation and removal of the product for repair, and shipping costs;

Operational adjustments covered in the operating manual for the product, and normal maintenance;

Damage that occurs in shipment, due to act of God, failures due to power surge, and cosmetic damage; and

Any hardware, software, firmware or other products or services provided by anyone other than D-Link.

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Some states do not allow exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the foregoing limitations and exclusions may not apply. This limited warranty provides specific legal rights and the product owner may also have other rights which vary from state to state.

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ABOUT THIS GUIDE

Congratulations on your purchase of the DSS-5+ 5-port 10/100Mbps Dual Speed 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 DSS-5+ 5-port 10/100Mbps Dual Speed Ethernet Switch.

Terms/Usage

In this guide, the term “**Switch**” (first letter upper case) refers to your DSS-5+, and “**switch**” (first letter lower case) refers to other Ethernet switches.

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 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.

INTRODUCTION

This chapter describes the features of the Switch and some background information about Ethernet/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, 100BASE-T (Fast Ethernet) 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 path and takes advantage of the 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 bridges Ethernet packets at the MAC address level of the Ethernet protocol. It transmits packets among connected Ethernet or Fast Ethernet LAN segments.

Switching is a cost-effective way of increasing the total network bandwidth available to users on a local area network. A switch divides a local area network into multiple, separate *segments*. Each segment has its own full Ethernet or Fast Ethernet bandwidth that doesn't compete with the other segments for network transmission.

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 and blocks traffic that does not need to be transmitted. By doing this the total network bandwidth is multiplied, while still maintaining the same network cabling and adapter cards.

For Fast Ethernet networks, a switch is an effective way of eliminating the problem 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 a Fast Ethernet network beyond the 205-meter network diameter limit. Switches supporting both traditional 10Mbps Ethernet and 100Mbps Fast Ethernet are 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. Today switches are an ideal solution to most kinds of local area network congestion problems.

Features

The DSS-5+ was designed for easy installation and high performance in an environment where network traffic and the number of users increases continuously.

Designed with the small and medium network in mind, the DSS-5+ comes in a small and compact size. Whether used to connect 10Mb and 100Mb network segments and servers together, or to extend an existing switched network, it has the necessary speed to do the job.

The DSS-5+ is expandable by cascading two or more switches together. All ports support up to 200Mbps. Any one of its five ports may be used to cascade to an additional switch to open a Full-Duplex Fast Ethernet pipe. A single uplink port is integrated into the DSS-5+ to negate the need for a cross-over or other special networking cable when cascading to another switch.

The DSS-5+ is a perfect choice for sites planning to upgrade to Fast Ethernet in the future. Ethernet workgroups can connect to the DSS-5+ now, and upgraded Fast Ethernet adapters and hubs can be added anytime later without requiring any change to the Switch or network configuration.

The Switch combine 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.

The Switch is an unmanaged 10/100 Fast Ethernet Switch that offers solutions in accelerating small Ethernet workgroup bandwidth. Other key features are:

Uplink/ MDI-II (media dependent interface) port for uplink to another switch, hub or repeater.

Store and forward switching scheme capability. As the result of complete frame checking and error frame filtering, this scheme prevents error packages from transmitting among segments.

NWay Auto-negotiation for any port. This allows for auto-sensing of speed (10/100Mbps) thereby providing you with automatic and flexible solutions in your network connections.

Flow control for any port. This minimizes dropped packets by sending out collision signals when the port's receiving buffer is full. Note that flow control is only available in half duplex mode.

Data forwarding rate per port is at wire-speed for 100Mbps speed.

Data forwarding rate per port is at wire-speed for 10Mbps speed.

Data filtering rate eliminates all error packets, runts, etc., per port at wire-speed for 100Mbps speed.

Data filtering rate eliminates all error packets, runts, etc., per port at wire-speed for 10Mbps speed.

UNPACKING AND SETUP

This chapter provides unpacking and setup information for DSS-5+.

Unpacking

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

One DSS-5+ 5-port 10/100Mbps Dual Speed Ethernet Switch

One external power adapter

This User's Guide

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

Setup

The setup of DSS-5+ can be performed using the following steps:

The surface must support at least 1.5 Kg for the Switch.

The power outlet should be within 1.82 meters (6 feet) of the Switch.

Visually inspect the DC power jack and make sure that it is fully secured to the power adapter.

Make sure that there is proper heat dissipation from and adequate ventilation around the Switch. Do not place heavy objects on the Switch.

IDENTIFYING EXTERNAL COMPONENTS

This section identifies all the major external components of the DSS-5+. Both the front and rear panels are shown followed by a description of each panel feature. The indicator panel is described in detail in the next chapter.

Front Panel

The figure below shows the front and rear panels of the DSS-5+.

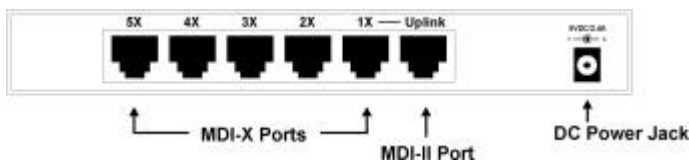


DSS-5+ 10/100M Dual Speed Ethernet Switch

LED Indicator Panel

Refer to the LED Indicator section for detailed information about each of the hub's LED indicators.

Rear Panel



DSS-5+ 10/100M Dual Speed Ethernet Switch

DC Power Jack: Power is supplied through an external AC power adapter. Check the technical specification section for information about the AC power input voltage.

Since the switch does not include a power switch, plugging its power adapter into a power outlet will immediately power

it on.

MDI-X Jacks: Use these jacks to connect stations to the hub. These are **MDI-X** (Medium-Dependent Interface, Cross-wired) jacks, which mean, you can use ordinary straight-through twisted-pair cables to connect user machines and servers to the switch through them. If you need to connect another device with an **MDI-X** jack, such as another switch or an Ethernet or Fast Ethernet hub, you should use a crossover cable, or make the connection using the **MDI-II** jack (described below). Please see www.dlink.com for more information on cross-over cables and cascading switches.

Uplink Jack(s) (MDI-II): Use this jack to connect stations to the hub. This is a **MDI-II** (Medium-dependent Interface, straight-wired) jack, which means you can connect the DSS-5+ to a device with a **MDI-X** port (like a hub or switch) using an ordinary straight-through cable.

PLEASE NOTE: When using the MDI-II to cascade to a switch or hub, the MDI-X directly next to it will be disabled automatically. A maximum of 5 devices can be attached to the switch at anytime.

LED Indicators

Power Indicator (PWR)

This LED will light a solid green when the unit is receiving power.

Full-Duplex/Collision (Full-Duplex/Collision)

This LED indicator will light a solid green when a respective port is in full duplex (FDX) mode. As collisions occur on the respective port it will blink. Collisions are normal in an Ethernet network.

100M Link/Activity, 10M Link/Activity

(100M LINK/ACT (green), 10LINK/ACT (amber))

This indicator lights green when the port is connected to a 100Mbps Fast Ethernet station. The indicator blinks

green as Fast Ethernet data is transmitted or received. The indicator lights amber when the port is connected to a 10Mbps Ethernet station or other network device. The indicator blinks amber as Ethernet data is transmitted or received.

CONNECTING THE SWITCH

This chapter describes how to connect the DSS-5+ to your Fast Ethernet network.

PC to Switch

A PC can be connected to the Switch via a two-pair Category 3,4, or5 UTP/STP straight-through cable. For 100Mbps operation Category 5 **must** be used. The PC (equipped with a RJ-45 10Mb Ethernet or 100Mb Fast Ethernet NIC) should be connected to any of the 5 ports (1x - 5x) for the DSS-5+.

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

The following are possible DSS-5+ LED read outs for a PC to Switch connection:

1. The “100LINK/ACT, 10LINK/ACT” LED indicator lights green for a good link at 100Mbps or lights amber for a good link at 10Mbps.
2. The “Full-Duplex/Collision” LED indicator shows whether the NIC is connected at full-duplex or half-duplex. Usually a NIC can be set to either duplex mode under Properties in the Network Properties Control Panel window.

Hub to Switch

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

A. 10BASE-T Hub

For a 10BASE-T hub, the Switch LED indicators should light up as follows:

“Full-Duplex/Collision” indicator is OFF initially (it will blink as collisions occur).

“100LINK/ACT, 10LINK/ACT LED” indicator is light amber.

B. 100BASE-TX Hub

For a 100BASE-TX hub, the Switch LED indicators should light up as the following:

“Full-Duplex/Collision” LED indicator is OFF initially (it will blink as collisions occur).

“100LINK/ACT, 10LINK/ACT” LED indicator is light green.

Hub without Uplink (MDII) port

If a hub is not equipped with an uplink (MDI-II) port, connection can be made using either straight cable or crossover cable.

A. 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.

B. Using crossover cable

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

Switch to Switch (other devices)

The 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. A Category 5 cable **must** be used for 100Mbps operation.

A. Using straight cable

When using 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.

B. Using crossover cable

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

1. The “100LINK/ACT, 10LINK/ACT” LED indicator light green for hookup to 100Mbps speed or light amber for hookup to 10Mbps speed.
2. The “Full-Duplex/Collision” LED indicator depends upon the connected switch’s capabilities for full-duplex or half-duplex. The DSS-5+ will automatically sense and support the faster method of communication.

Port Speed & Duplex Mode

After plugging the selected cable to a specific port, the system uses auto-negotiation to determine the transmission mode for any new twisted-pair connection:

If the attached device does not support auto-negotiation or has auto-negotiation disabled, an auto-sensing process is initiated to select the speed and set the duplex mode to **half-duplex**.

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
Data Transfer Rate	Ethernet: 10Mbps (half duplex) 20Mbps (full duplex) Fast Ethernet: 100Mbps (half duplex) 200Mbps (full duplex)
Topology	Star
Network Cables	10BASE-T: 2-pair UTP Cat. 3,4,5 (100 m), EIA/TIA-568 100-ohm STP (100 m) 100BASE-TX: 2-pair UTP Cat. 5 (100 m), EIA/TIA-568 100-ohm STP (100 m)
Number of Ports	5 x 10/100Mbps ports
Uplink Port	MDI-II RJ-45 shared with port * 1

Physical and Environmental	
DC inputs	DC5V/2.4A
Power Consumption	10 watts. (max.)
Temperature	Operating: 0° ~ 50° C Storage: -10° ~ 70° C
Humidity	Operating: 10% ~ 90% Storage: 5% ~ 90%
Dimensions	171 x 98 x 29 mm (W x H x D)
EMI:	FCC Class B, CE Mark B, VCCI-II
Performance	
Transmission Method:	Store-and-forward
Packet Filtering/Forwarding Rate:	10Mbps Ethernet: 14,880/pps 100Mbps Fast Ethernet: 148,800/pps
MAC Address Learning:	Automatic update

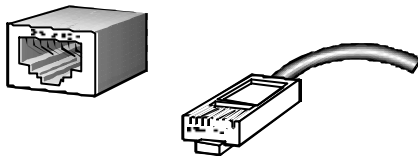
RJ-45 PIN SPECIFICATION

When connecting your 5-port 10/100Mbps Dual Speed 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.

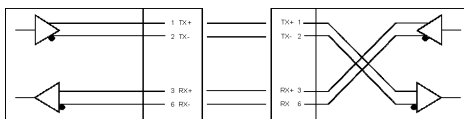
RJ-45 Connector pin assignment	
Contact	Media Direct Interface Signal
1	TX + (transmit)
2	TX - (transmit)
3	Rx + (receive)
4	Not used
5	Not used
6	Rx - (receive)
7	Not used
8	Not used

The standard cable, RJ-45 pin assignment

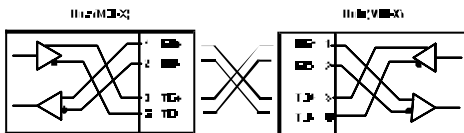


The standard RJ-45 receptacle/connector

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