D-Link Corporation
FCC ID: KA2ED2DSH8H
Ethernet Dual Speed Hub, Model DSH-8

Instruction Manual
Federal Communication Commission Interference Statement

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 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.

FCC Caution: To assure continued compliance, use only shielded twisted interface cables when connecting LAN network connections. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Warning

Class B for Model DSH-8
FCC ID No: KA2ED2DSH8H

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

Changes or modifications not expressly approved by user authority to operate this equipment.

Trademarks

Copyright Statement

Rev. 03 (May 1999)
6DSH8*..03
Printed In Taiwan

Limited Warranty

Hardware:

D-Link warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following periods measured from date of purchase from D-Link or its Authorized Reseller:

Product Type	Warranty Period
Complete products	One year
Spare parts and spare kits	90 days

The one-year period of warranty on complete products 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 90 days.

If the product proves defective within the applicable warranty period, D-Link will provide repair or replacement of the product. D-Link shall have the sole discretion whether to repair or replace, and replacement product may be new or reconditioned. Replacement product shall be of equivalent or better specifications, relative to the defective product, but need not be identical. Any product or part repaired by D-Link pursuant to this warranty shall have a warranty period of not less than 90 days, from date of such repair, irrespective of any earlier expiration of original warranty period. When D-Link provides replacement, then the defective product becomes the property of D-Link.

Warranty service may be obtained by contacting a D-Link office within the applicable warranty period, and requesting a Return Material Authorization (RMA) number. If a Registration Card for the product in question has not been returned to D-Link, then a proof of purchase (such as a copy of the dated purchase invoice) must be provided. If Purchaser's circumstances require special handling of warranty correction, then at the time of requesting RMA number, Purchaser may also propose special procedure as may be suitable to the case.

After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. The package must be mailed or otherwise shipped to D-Link with all costs of mailing/shipping/insurance prepaid; D-Link will ordinarily reimburse Purchaser for mailing/shipping/insurance expenses incurred for return of defective product in accordance with this warranty. D-Link shall never be responsible for any software, firmware, information, or memory data of Purchaser contained in, stored on, or integrated with any product returned to D-Link pursuant to this warranty.

Any package returned to D-Link without an RMA number will be rejected and shipped back to Purchaser at Purchaser's expense, and D-Link reserves the right in such a case to levy a reasonable handling charge in addition mailing or shipping costs.

D-Link Offices for Registration and Warranty Service

The product's Registration Card, provided at the back of this manual, must be sent to a D-Link office. To obtain an RMA number for warranty service as to a hardware product, or to obtain warranty service as to a software product, contact the D-Link office nearest you. An addresses/telephone/fax list of D-Link offices is provided in the back of this manual.

WARRANTIES EXCLUSIVE

IF THE D-LINK PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, THE CUSTOMER'S SOLE REMEDY SHALL BE, AT D-LINK'S OPTION, REPAIR OR REPLACEMENT. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. D-LINK NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION MAINTENANCE OR USE OF D-LINK'S PRODUCTS

D-LINK SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY THE CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING OR OTHER HAZARD.

LIMITATION OF LIABILITY

IN NO EVENT WILL D-LINK BE LIABLE FOR ANY DAMAGES, INCLUDING LOSS OF DATA, LOSS OF PROFITS, COST OF COVER OR OTHER INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES ARISING OUT THE INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE OR INTERRUPTION OF A D- LINK PRODUCT, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY. THIS LIMITATION WILL APPLY EVEN IF D-LINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

IF YOU PURCHASED A D-LINK PRODUCT IN THE UNITED STATES, SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

Product Description

The dual-speed standalone Ethernet/Fast Ethernet hub is designed to allow easy migration and integration between 10Mbps Ethernet and 100Mbps Fast Ethernet, while providing flexibility in cable connections.

The device can operate with both IEEE 802.3 10BASE-T connections (twisted-pair Ethernet operating at 10 megabits per second) and IEEE 802.3u 100BASE-TX connections (twisted-pair Fast Ethernet operating at 100 megabits per second). All of the twisted-pair ports support Auto-Negotiation (NWay), allowing the hub to automatically detect the speed of a network connection.

The hub has 8 ports and can have a single uplink connection to another 100BASE-TX Class II Fast Ethernet repeater (hub or hub stack).

On the hub, the 10Mbps and 100Mbps segments are separate and do not intercommunicate. The device contains a built-in switch, making it possible to transparently bridge between the 10Mbps and 100Mbps segments.

Product Features

Compatible with the IEEE 802.3 10BASE-T Ethernet and 802.3u 100BASE-TX Fast Ethernet industry standards for interoperability with other Ethernet/Fast Ethernet network devices.

Eight NWay RJ-45 ports for connecting stations to the network.

Built-in switching function supports bridging between 10Mbps and 100Mbps segments.

LED indicators for power, collision, link, network activity, switch capability, and operating speed (10 or 100 Mbps).

Auto-partitioning for network protection.

Data collision detection and handling.

Preamble regeneration, signal retiming.

Uplink port allows easy linking of two Fast Ethernet or four Ethernet hub stacks to further expand your network.

External switching power adapter featured (output 5V/2.5A).

Simple Plug and Play installation.

Compact size and light weight, ideal for SOHO, cubicle LANs.

Unpacking

The carton should contain the following items:

One dual-speed standalone hub

One external universal power adapter

One power cord

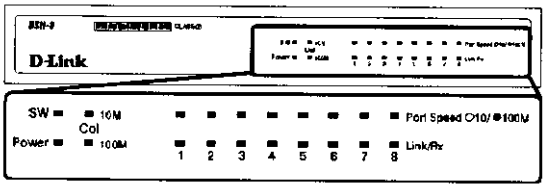
Four rubber feet to be used for cushioning

This *User's Guide*

Inspect the hub and all accompanying items. If any item is damaged or missing, report the problem immediately to your networking product dealer.

External Components

Front Panel



Power Indicator

This LED indicator lights green when the hub is receiving power; otherwise, it is off.

Switch Indicator (SW)

The switch LED indicator shines a steady green when the hub built-in switch is

functioning correctly. The indicator should shine whenever the hub has power.

Collision Indicators (Col 10M/ Col 100M)

These LEDs indicate data collisions on the respective 10Mbps Ethernet or 100Mbps Fast Ethernet segments connected to the hub. (If several hubs are linked together, all of them should detect and indicate the same collision, since collisions span the entire network segment.) Whenever a collision is detected, the respective collision indicator will briefly blink amber.

Link (steady green)

The indicator of a port lights green when the port is connected to a powered Ethernet or Fast Ethernet station. If the station to which the hub is connected is powered off, or if there is a problem with the link, the LED will remain off.

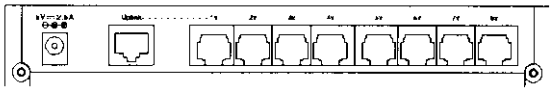
Receive (Rx) (blinking green)

When information is received on a port, its LED indicator will blink off briefly. Upon reception, the data will be transmitted to all other connected ports.

10/100 Port Speed Indicators

There a port speed LED indicator for each of the twisted-pair ports on the hub. A port speed indicator should light green when a 100BASE-TX device is connected to the port, and remain dark if the port is unconnected or if a 10BASE-T device is connected.

Rear Panel



Twisted-Pair Ports

Use any of these ports to connect stations to the hub. The ports are MDI-X ports, which means you can use ordinary straight-through twisted-pair cables to connect the hub to PCs, workstations, or servers through these ports. If you need to connect another device with MDI-X ports such as another hub or an Ethernet switch, you should use a crossover cable, or connect using the Uplink port.

Uplink Port

The Uplink port is an MDI-II port, which means you can connect the hub to another device with MDI-X ports using an ordinary straight-through cable, making a crossover cable unnecessary.

Port 1 and the Uplink port are really the same port, except that their pinouts are different. **Do not use both Port 1 and the Uplink port at the same time.**

AC Power Adapter Connector

For the external switching power supply.

Installing the Hub

Install the hub in a fairly cool and dry place. See *Specifications* for the acceptable temperature and humidity operating ranges.

Install the hub in a site free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.

Leave at least 10 cm of space at the front and rear of the hub for ventilation.

Install the hub on a sturdy, level surface that can support its weight.

When installing the hub on a level surface, attach the rubber feet to the bottom of the device. The rubber feet cushion the hub and protect the hub case from scratches and prevent it from scratching other surfaces.

Making Connections

Connectivity Rules

Ethernet (10Mbps) networks need to respect the following connectivity rules:

The maximum length of a twisted-pair cable segment is 100 meters. Cabling should be Category 3 or better.

Between any two end-stations in a collision domain, there may be up to five cable segments and four intermediate repeaters (hubs, hub stacks, or other repeaters).

If there is a path between any two end-stations containing five segments and four repeaters, then at least two of the cable segments must be point-to-point link segments (e.g., 10BASE-T, 10BASE-FL), while the remaining segments may be populated (mixing) segments (e.g., 10BASE-2 or 10BASE-5).

Fast Ethernet (100Mbps) networks need to respect the following connectivity rules:

The maximum length of a twisted-pair segment (that is, the distance between a port in the hub to a single-address network device such as a PC, server, or Ethernet switch) is 100 meters. Cabling and other wiring should be certified as Category 5 or shielded twisted pair (STP).

The maximum diameter in a collision domain is about 205 meters using two Class II hubs (or hub stacks).

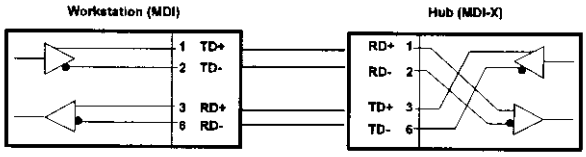
Between any two end-stations in a collision domain, there may be up to three cable segments and two Class II hubs or hub stacks.

Hub to End-Station Connection

After the hub properly installed, it can support up to eight end-station connections. Fast Ethernet connection requires either a Category 5 UTP cable or an STP cable. These cables can be up to 100 meters long.

Ethernet connection requires a Category 3 or better UTP cable. It is recommended that you use Category 5 cabling for all connections, in order to make it easier to transition all stations to 100Mbps.

You can connect any combination of PCs, servers, and other single-address network devices to the eight twisted-pair ports using straight-through twisted-pair cables. These cables should not be crossed over.



When connecting a PC or a server, the system being connected should have an Ethernet or Fast

Ethernet network interface card with a twisted-pair port.

Hub-to-Hub Uplink

You can link two hubs or a hub with a hub stack by using any of the twisted-pair ports or the Uplink port. Linking hubs using ordinary twisted-pair ports requires crossover twisted-pair cables; linking using one ordinary twisted-pair port and the Uplink port requires an ordinary straight-through twisted-pair cable. The Uplink port is shared with Port 1, and you should not use both Port 1 and the Uplink port at the same time.

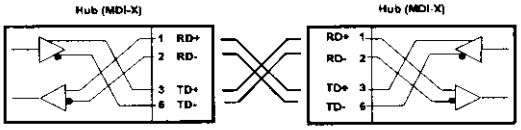
When connecting two hubs or a hub with a hub stack in this fashion, the maximum distance between any two end-stations in a collision domain is 205 meters. If each link between the hub and an end-station is 100 meters, then the hub-to-hub connection is limited to 5 meters. However, if the longest hub-to-end-station connection is less than 100 meters, then the hub-to-hub connection can be up to 100 meters long as long as the 205-meter total network diameter rule is followed.

The following table describes different methods of linking hubs (or hub stacks):

HUB PORT USED	DEVICE	PORT TYPE	CABLE TO USE
Normal	Switch or Hub	Non-Uplink	Cross-over (X)
Normal	Switch or Hub	*Uplink*	Straight-Through (II)
Normal	Server (or PC)		Straight-

			Through (II)
Uplink	Switch or Hub	Non-Uplink	Straight-Through (II)
Uplink	Switch or Hub	*Uplink*	Cross-over (X)
Uplink	Server (or PC)		Cross-over (X)

A crossover cable is a straight-through twisted-pair cable in which the wires have been crossed. The figure below shows the pin assignments for an Ethernet or Fast Ethernet crossover cable:



NOTE: *The first twisted-pair port (Port 1) is shared with the Uplink port. If you connect a hub to the Uplink port, then do not use Port 1.*

Specifications

Standards Compliance:	IEEE 802.3 10BASE-T Ethernet repeater, IEEE 802.3u 100BASE-TX Fast Ethernet repeater (Class II), ANSI X3T9.5 Twisted-Pair Transceiver
Topology:	Star
Protocol:	CSMA/CD
Network Data Transfer Rate:	Ethernet: 10Mbps; Fast Ethernet: 100Mbps
Number of Ports per Hub:	8, all dual-speed (10/100Mbps)

Network Cables:	10BASE-T: 2-pair STP Cat. 3,4,5 (100 m); EIA/TIA-568 100-ohm screened twisted pair (STP) (100 m)
LED State Indicators:	Power, 10Mbps collision, 100Mbps collision, SW, Link/ Receive, Speed (10/100Mbps)
Power Supply:	100V to 240V AC, 47 to 63 Hz external universal power adapter (output: 5V/2.5A)
Power Consumption:	8 watts
Dimensions:	198 mm (W) x 28 mm (H) x 115 mm (D)
Weight:	550 g (w/o external power adapter) 700 g (w/ external power adapter)
Operating Temperature:	0* to 45蚓 (32*-113蚌)
Storage Temperature:	-25* to 55蚓 (-13*-131蚌)
Humidity:	5%-95% non-condensing
Emissions:	FCC Class B, VCCI Class A, CE Mark, C-tick
Safety	UL, CUL, CE Mark, TUV/GS

D-Link Offices

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WEB: www.dlink.com.tw BBS: 886-2-2910-1835

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):_____

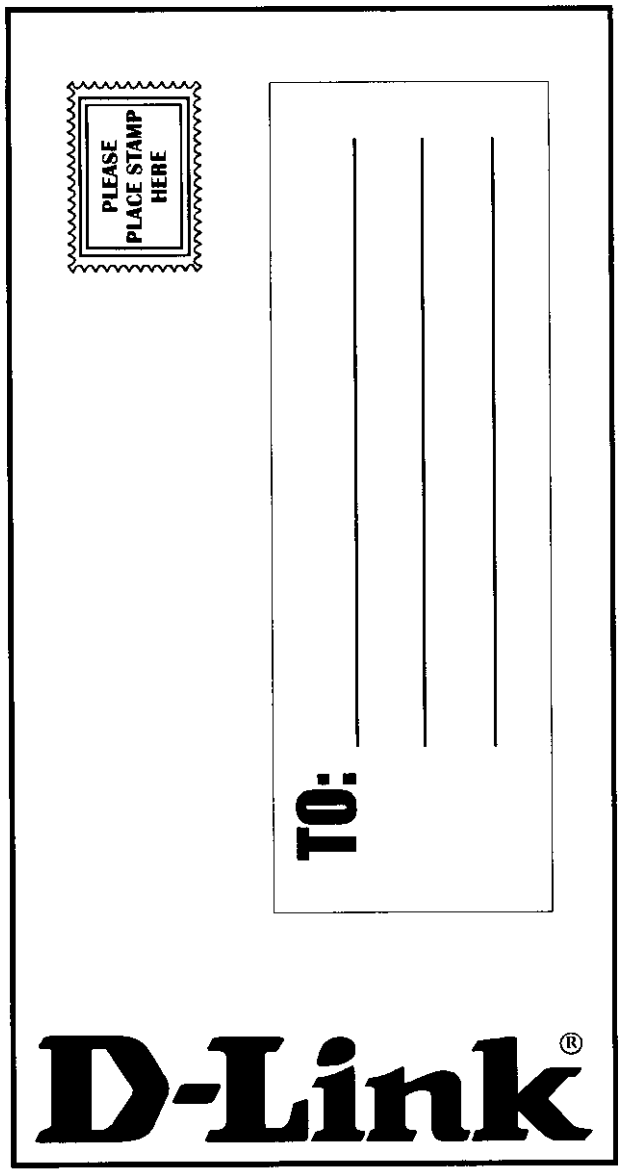
Product Model	Product Serial No.	* Product installed in type of computer (e.g., Compaq 586)	* Product installed in computer serial No.

(* 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 ☐Other_____
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 ☐Other_____
5. **What network management program does your organization use ?**
   ☐D-View ☐HP OpenView/Windows ☐HP OpenView/Unix ☐SunNet Manager
   ☐Novell NMS ☐NetView 6000 ☐Other_____
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 ☐Other_____
7. **What applications are used on your network?**
   ☐Desktop publishing ☐Spreadsheet ☐Word processing ☐CAD/CAM
   ☐Database management ☐Accounting ☐Other_____
8. **What category best describes your company?**
   ☐Aerospace ☐Engineering ☐Education ☐Finance ☐Hospital ☐Insurance/Real Estate
   ☐Manufacturing ☐Retail/Chainstore/Wholesale ☐Government ☐Legal ☐VAR
   ☐Transportation/Utilities/Communication ☐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?
    _____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TO:
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