

SOHOConnect Series

DHD-801

DHD-1601

Dual-Speed Hub

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FCC Warning

This equipment has been tested and found to comply with the regulations 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 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.

CE Mark Warning

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

Revision

The information in this manual is subject to change without notice.
User's manual for PLANET SOHOConnect Series,

DHD-801 / DHD-1601

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ABOUT THIS GUIDE

This guide discusses how to install and use your DHD-801/DHD-1601, the 8/16-port 10/100Mbps Dual speed Hub.

Conventions

As used in this guide, the term *hub*, unless otherwise noted, refers to the DHD-801 or DHD-1601, the dual speed hub.

Overview of the User's Guide

- ◆ Chapter 1, *Introduction*. Provides information on Fast Ethernet networks and introduces your hub's features.
- ◆ Chapter 2, *Unpacking and Setup*. Helps you get started in setting up the hub.
- ◆ Chapter 3, *Understanding Indicators*. Describes all LED indicators on the hub's front panel. Understanding these indicators is essential to effectively using the hub.
- ◆ Chapter 4, *Making Connections*. Provides information on connecting to the hub's twisted-pair ports and uplinking hubs together.
- ◆ Appendix A, *Cables and Connectors*. Provides specifications on the cables and connectors used with the hub.
- ◆ Appendix B, *Specifications*. Lists the hub's specifications.

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INTRODUCTION

This chapter introduces your hub and gives some background information about the technology of the hub uses.

Product Description

DHD-801/1601 is designed to allow easy integration and migration between 10Mbps Ethernet and 100Mbps Fast Ethernet.

The hub can operate with both IEEE 802.3 10BASE-T connections and IEEE 802.3u 100BASE-TX connections. All of the twisted-pair ports support NWay auto-negotiation, allowing the hub to automatically detect the speed of a network connection. This means you can connect all of your Ethernet and Fast Ethernet hosts to your hub without any rewiring required when a host is upgraded from 10 Mbps to 100 Mbps.

This Hub with built-in switch function allows communication between network end nodes operating at different speeds.

Because it conforms to the standards for both Ethernet and Fast Ethernet Class II repeaters, your hub can also be Uplinked together with a similarly conformant hub to

expand the network still further. The uplink connection will carry both 10Mbps and 100Mbps network signals.

Product Features

The list below highlights your hub's features and specifications:

- ◆ Compatible with the IEEE 802.3 10BASE-T Ethernet and 802.3u 100BASE-TX Fast Ethernet industry standards for interoperability with other Ethernet and Fast Ethernet network devices.
- ◆ Ethernet connections support Category 3 or better twisted-pair cables.
- ◆ Fast Ethernet connections support both shielded twisted-pair and Category 5 unshielded twisted-pair cables.
- ◆ Fast Ethernet connections support a maximum distance of 100 meters from end-station to hub, and a total network diameter of 205 meters.
- ◆ Eight/Sixteen 10/100Mbps NWay ports per hub for connecting stations to the network.
- ◆ Hubs with built-in switch function automatically transfer packets between 10Mbps Ethernet and 100Mbps Fast Ethernet connections, allowing communication between end nodes operating at different speeds.
- ◆ LED indicators for power, 10-Mbps collision (DHD-1601), 100-Mbps collision, connection speed per port, and port status per port.
- ◆ Uplink jack for easy linking of two hubs to further expand the network.
- ◆ External AC power adapter.

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UNPACKING AND SETUP

This chapter provides information on the unpacking and initial installation of your hub.

Unpacking

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

- ◆ One 10/100Mbps Dual speed Hub
- ◆ One AC power adapter, suitable for your area's electrical power connections
- ◆ Accessory pack
- ◆ This User's Guide

If any item is damaged or missing, report the problem immediately to your network equipment dealer.

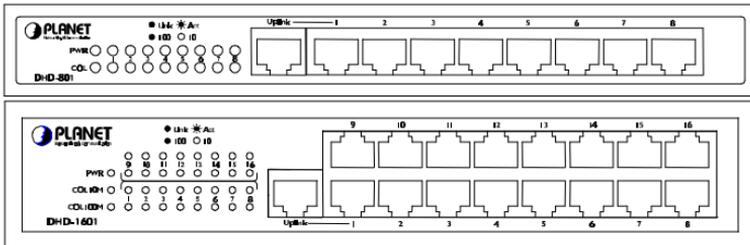
Identifying External Components

This section identifies all the major external components of the hub. 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 panels of the hubs.



8/16-port 10/100Mbps Dual speed Hub

- ◆ LED Indicator Panel

Refer to the next chapter, *Understanding Indicators*, for detailed information about each of the hub's LED indicators.

- ◆ Port (MDI-X) Jacks

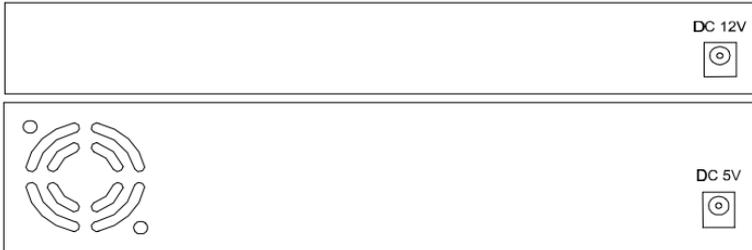
Use these jacks to connect stations to the hub. These are numbered jacks, or called **MDI-X** (Medium-Dependent Interface, Cross-wired) jacks, which mean, you can use ordinary straight-through twisted-pair cables to connect user machines and servers to the hub through them. If you need to connect another device with an **MDI-X** jack, such as another hub or an Ethernet switch, you should use a crossover cable, or make the connection using the **MDI-X** jack (described below). For more information about crossover connections.

- ◆ Uplink Jack (MDI-II)

Use this jack to connect another hub to the hub. This is **MDI-II** (Medium-dependent Interface, straight-wired)

jack, which means you can connect the hub to a device with a MDI-**X** port using an ordinary straight-through cable, making a crossover cable unnecessary.

Rear Panel



- ◆ DC Power Jack
For the AC power adapter.
- ◆ FAN (DHD-1601)
For cooling the device and keep the hub in a well working temperature.

Installing the Hub

Installation

The site where you install the hub may greatly affect its performance. When installing, consider the following pointers:

- ◆ Install the hub in a fairly cool and dry place. See Appendix B, *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 each device. The rubber feet cushion the hub and protect the hub case from scratches.

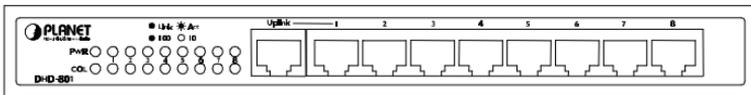
Connecting the Power Adapter

Power is supplied to the Dual speed Hub through an AC power adapter. The accepted DC power is 12V, 1.2A for 8-port model, and DC 5V, 5A for 16-port model. To prevent from damage the hub, please use the adapter in the package.

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UNDERSTANDING INDICATORS

Before connecting network devices to the hub, take a few minutes to look over this section and familiarize you with the front panel LED indicators of your dual speed hub, depicted below.



DHD-801 Front Panel

Hub State Indicators

◆ Power Indicator (PWR)

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

◆ 100M Collision (COL 100M)

This indicator indicates data collisions on the respective 100Mbps Fast Ethernet segments of 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 100 COL indicator will briefly blink amber.

◆ 10M Collision (COL 10M, DHD-1601)

This indicator indicates data collisions on the respective 10Mbps Ethernet segments of 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 10 COL indicator will briefly blink amber.

Port State Indicators

There are two port state indicators for each of the twisted-pair ports on the hub. Each port's LED status indicators report the port is working on 10Mbps mode or 100Mbps mode, and indicator for link or activity status.

The following describes each indicator and the meaning of each condition:

◆ Link/Active

This indicator green when the port is connected to a either 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. And the indicator blinking green when the data will be received to all other connected ports.

◆ 100Mbps (Speed)

This indicator green when the port is connected to a 100Mbps Fast Ethernet station and remains on. If the station to which the hub is connected is powered off, or if the connected station is an Ethernet device, the LED will remain off.

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MAKING CONNECTIONS

This chapter discusses how to connect end nodes, and uplink two hubs together.

Connectivity Rules

Ethernet (10Mbps) networks have 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 or other repeaters). **And be attention, you have to using 10Mbps Ethernet repeaters to connect in your network segments to avoid the limitation of Fast Ethernet. Because if you havent use pure 10Mbps Ethernet repeaters in this network segments then it would be under the rule of Fast Ethernet Standards in this 10/100Mbps Dual speed Hub products that you used now.**

- ◆ If there has 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 or 10BASE-FL). While the remaining segments may be populated segments (that is, they can be 10BASE-2 or 10BASE-5 segments with end nodes attached).

Fast Ethernet (100Mbps) networks have the following connectivity rules:

- ◆ The maximum length of a twisted-pair segment (that is, the distance between a port on the hub and an addressable network device such as an end-station computer, server, or Fast Ethernet switch) is 100 meters. All cabling should be certified as Category 5 or higher UTP or equivalent (for example, Type 1 STP with RJ-45 plugs).
- ◆ The maximum diameter of a collision domain is 205 meters using two Class II hubs uplinked together.
- ◆ Between any two end-stations in a collision domain, there may be up to three cable segments and two Class II hubs.

Hub-to-end-node Connections

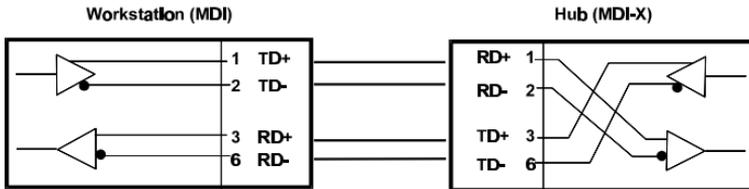
After the hub is properly installed, it can support up to five end-node connections.

Each Fast Ethernet connection requires either a Category 5 UTP cable or a Type 1 STP cable. These cables can be up to 100 meters long.

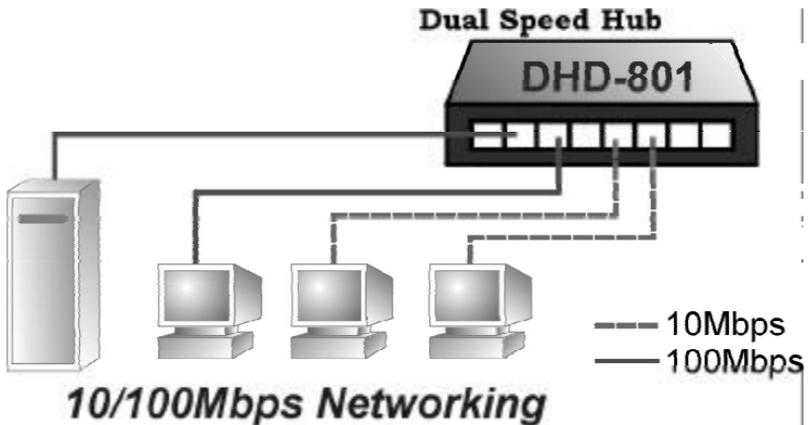
Each Ethernet connection requires a Category 3 or better UTP cable. It is recommended that you use Category 5

cabling for all connections in order to make it easier to transit all stations to 100Mbps.

You can connect any combination of end-station computers, servers, and other addressable network devices to the twisted-pair ports using straight-through twisted-pair cables. **Do not use crossover cables.** The following figure illustrates the pin assignments for a straight-through cable:



When connecting an end-station computer or a server, the system being connected should have an Ethernet or Fast Ethernet network interface card with a twisted-pair port. The following figure shows typical connections between the hub and end nodes:



Uplink Connection

You can Uplink two hubs to each other using either (a) any two numbered jacks or (b) a numbered jack and an **Uplink** jack. (In the discussion that follows, the word *hub* should be taken to mean a hub, in the same product family as your Dual speed Hub.)

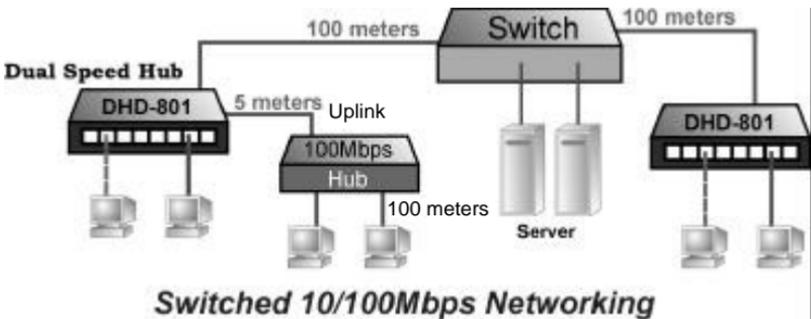
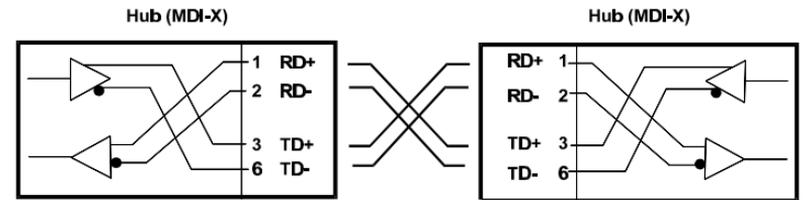
Uplinking hubs using numbered jacks requires a crossover twisted-pair cable; uplinking hubs using an numbered jack and an **Uplink** jack requires an ordinary straight-through twisted-pair cable. The **Uplink** and **port#1** jacks are wired to the same circuitry (they are just wired to it in different ways), so you must never use the **port#1** and the **Uplink** jack at the same time.

When you uplink two hubs together the maximum distance between **any** two end-nodes in a collision domain is **205** meters. If both hubs have maximum-length (100-meter) connections to end nodes (even if there is only one such connection on each hub), the hub-to-hub uplink connection will be limited to 5 meters. However, if the longest hub-to-end-node connection is less than 100 meters, the uplink connection can be longer than 5 meters, provided that the 205-meter total network diameter rule is followed.

The following table describes different methods of linking hubs:

HUB PORT USED	DEVICE <small>that is going to attached to</small>	PORT TYPE	CABLE TO USE
Normal	Switch or Hub	Non-Uplink	Crossover (X)
		Uplink	Straight-through ()
	Network end node	Straight-through ()	
Uplink	Switch or Hub	Non-Uplink	Straight-through ()
		Uplink	Crossover (X)
	Network end node	Crossover (X)	

A crossover cable is a 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:



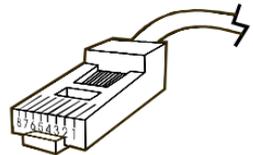
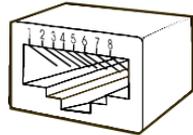
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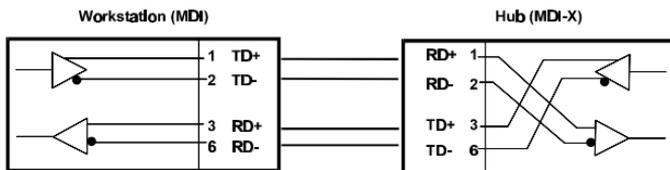
CABLES AND CONNECTORS

100BASE-TX Fast Ethernet Cables and Connectors

- ◆ Cable characteristics: Category 5 unshielded twisted-pair or EIA/TIA-568 compliant, 100-ohm shielded twisted-pair data cable with 0.4 to 0.6 mm (22 to 26 AWG) wires in two or four twisted pairs (only two pairs--that is, four wires--are used for 100BASE-TX).
- ◆ Maximum segment length: 100 meters
- ◆ Maximum network diameter: 205 meters
- ◆ Connectors: RJ-45



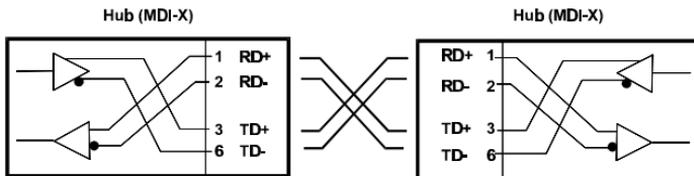
Straight Twisted-Pair Cable Pinouts		
Contact	MDI-X Signal	MDI-II Signal
1	RD+ (receive)	TD+ (transmit)
2	RD- (receive)	TD- (transmit)
3	TD+ (transmit)	RD+ (receive)
4, 5	Not used	Not used
6	TD- (transmit)	RD- (receive)
7,8	Not used	Not used



Crossover Cables

When making an uplink connection between one hub and another (or between a hub and a switch or bridge) using **X**-type jacks at both ends, you must use a crossover cable. In a crossover cable, two pairs of wires are switched at one end. Carry out the following steps to create a crossover twisted-pair cable:

1. Leave one end of the cable as-is, with the wiring on the RJ-45 connector unchanged. The wiring needs to be modified at one end only.
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:



B

SPECIFICATIONS

General

Standards: IEEE 802.3 10BASE-T Ethernet repeater, IEEE 802.3u 100BASE-TX Fast Ethernet repeater (Class II), and ANSI X3T9.5 twisted-pair transceiver

Topology: Star

Protocol: CSMA/CD

Network Data Transfer Rate: **Fast Ethernet:** 100Mbps
Ethernet: 10Mbps

Number of Ports: 8/16, all dual-speed (10/100 Mbps)

Network Media: **Ethernet:** Category 3 or better UTP cable, maximum length 100 meters.

Fast Ethernet: Category 5 UTP/STP, 100-ohm twisted-pair (maximum length 100 meters) for hub-to-station links; Cat 5 UTP, 100-ohm UTP/STP for hub-to-hub linking

LED Indicators

Hub Status: Power, 10Mbps collision (DHD-1601),
100Mbps collision

Port Status (per port): Speed (10/100 Mbps), connection /
Active status

Environmental and Physical

Power Adapter: AC external power adapter. Output
12 V DC/1.2A (DHD-801)
5V DC/ 5 A (DHD-1601)

Power Consumption: 12 / 25 Watt. (max.)

Dimensions (W ´ D ´ H):

220mm × 130mm × 27mm (DHD-801)

220mm × 130mm × 44mm (DHD-1601)

Operating Temperature: 0 to 50°C

Storage Temperature: 20 to 70°C

Humidity: 5% to 95% (non-condensing)

Emissions: FCC Class A, CE Mark