

**SOHOConnect Series**  
**SD-500 / SD-800**  
**5/8-port 10/100Base-TX**  
**Dual-Speed Hub with Switch**

## Trademarks

Copyright © PLANET Technology Corp. 2000.

Contents subject to revision without prior notice.

PLANET is a registered trademark of PLANET Technology Corp. The information in this manual is subject to change without notice. All other trademarks belong to their respective owners.

## FCC Warning

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

## 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,

**Plastic Model: SD-500, SD-800**

**Rev 1.0** (February, 2000)

**Part No.** EM-SD58V1

---

# TABLE OF CONTENTS

---

<b>ABOUT THIS GUIDE .....</b>	<b>v</b>
<i>Conventions .....</i>	<i>v</i>
<i>Overview of the User's Guide .....</i>	<i>v</i>
<b>INTRODUCTION.....</b>	<b>1</b>
<i>Product Description.....</i>	<i>1</i>
<i>Product Features.....</i>	<i>2</i>
<b>UNPACKING AND SETUP .....</b>	<b>3</b>
<i>Unpacking.....</i>	<i>3</i>
<i>Identifying External Components .....</i>	<i>4</i>
Front Panel .....	4
Rear Panel.....	5
<i>Installing the Hub.....</i>	<i>6</i>
Installation.....	6
<i>Connecting the Power Adapter.....</i>	<i>6</i>
<b>UNDERSTANDING INDICATORS.....</b>	<b>7</b>
<i>Hub State Indicators.....</i>	<i>7</i>
<i>Port State Indicators.....</i>	<i>8</i>

<b>MAKING CONNECTIONS .....</b>	<b>11</b>
<i>Connectivity Rules.....</i>	<i>11</i>
<i>Hub-to-end-node Connections .....</i>	<i>13</i>
<i>Uplink Connection.....</i>	<i>14</i>
<b>CABLES AND CONNECTORS.....</b>	<b>17</b>
<i>100BASE-TX Fast Ethernet Cables and Connectors .....</i>	<i>17</i>
<i>Crossover Cables .....</i>	<i>18</i>
<b>SPECIFICATIONS .....</b>	<b>19</b>
<i>General.....</i>	<i>19</i>
<i>LED Indicators.....</i>	<i>20</i>
<i>Environmental and Physical .....</i>	<i>20</i>

# ABOUT THIS GUIDE

---

This guide discusses how to install and use your SD-500/SD-800, the 5/8-port 10/100Mbps Dual speed Hub.

---

## Conventions

---

As used in this guide, the term *hub*, unless otherwise noted, refers to the SD-500/SD-800, 5/8-port 10/100Mbps Dual speed Hub with which this guide was packaged or to another hub in the same product family.

---

## 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.

---



---

# ***INTRODUCTION***

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

---

## **Product Description**

---

SD-500/SD-800 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.

Five/Eight 10/100Mbps Auto-Negotiation 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, collision, connection speed, port status, and extension port full duplex status.

Uplink jack for easy linking of two hubs to further expands the network.

Extra-Long uplink function, supported 100Mbps uplink distance up to 100 meters

External AC power adapter.

**2**

---

# **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

Rubber Foot

This User's Guide

Quick Installation Guide

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

---

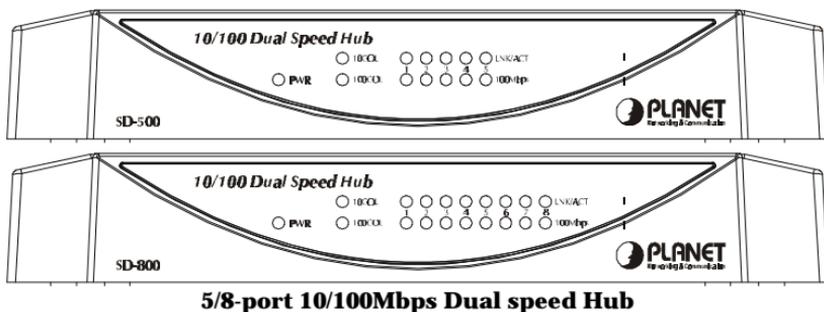
# Identifying External Components

---

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

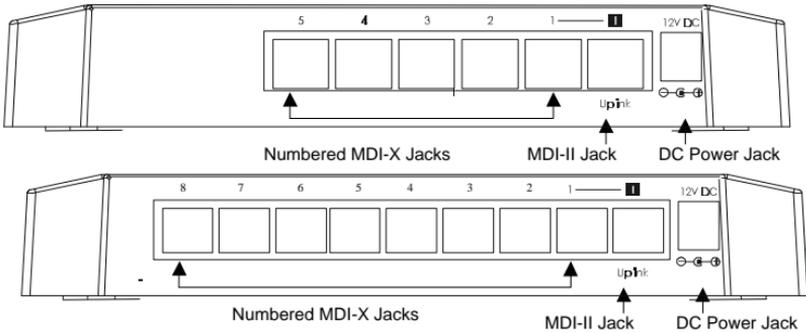
The figure below shows the front panels of the hubs.



## LED Indicator Panel

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

## Rear Panel



### Numbered Port (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 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 other 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.

### DC Power Jack

For the AC power adapter.

## 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 5/8-port 10/100Mbps Dual speed Hub through an AC power adapter.

**3**

---

# ***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 5/8-port 10/100Mbps dual speed hub.

---

## **Hub State Indicators**

---

### **Power Indicator (PWR)**

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

### **100M Collision (COL 100)**

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 10)**

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 or 100Mbps mode, and indicator for link or activity status.

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

### Link/Active (**Link/Act**)

This indicator green when the port is connected to either 10Mbps Ethernet station or 100Mbps 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.

All the indicator blinking green when the data will be received to all other connected ports if the workstations are connected with a good link.

### Speed Indication (**100Mbps**)

This indicator amber when the port is connected to a 100Mbps Fast Ethernet station. If the station to which the hub is connected is powered off, or if the station is running in 10Mbps, the LED will remain off.

To summarize the LED indication, please refer to the table below:

<b>LED Status</b>	<b>Description</b>
Power Lit green	The DC power is detected
10COL Blinking amber	To indicate 10Mbps LAN segment detects a collision
100COL Blinking amber	To indicate 100Mbps LAN segment detects a collision
Port Link/ACT Lit green	The port detects link-pulse from end-node and get connected
Port Link/ACT Blinking green	The port is receiving data packets from end-node
Port 100Mbps Lit amber	The port is runs in 100Mbps, else in 10Mbps



# 4

---

## 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 haven't use pure 10Mbps Ethernet repeaters in this network segments then it would be under the rule of Fast Ethernet Standards in this 5/8-port 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.

To summarize the guide above, you can refer to the table below.

<b>Network</b>	<b>Ethernet</b>	<b>Fast Ethernet</b>
Cable Type	Category 3~5 UTP/STP	Category 5 UTP/STP
Distance (end to end)	100 meters	100meters
Number of Hubs cascade	4	2
Max distance from one device to any another in that network	500 meters	205 meters (port#2~5) 300 meters (port#1/Uplink)

The port #1 /Uplink-port supports full-featured switch capability, you can break the class II Fast Ethernet rules to extend the distance up to 300 meters.

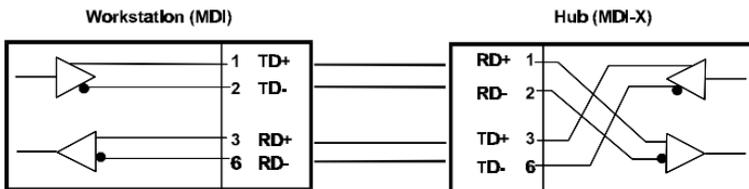
## Hub-to-end-node Connections

After the hub is properly installed, it can support up to eight 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.

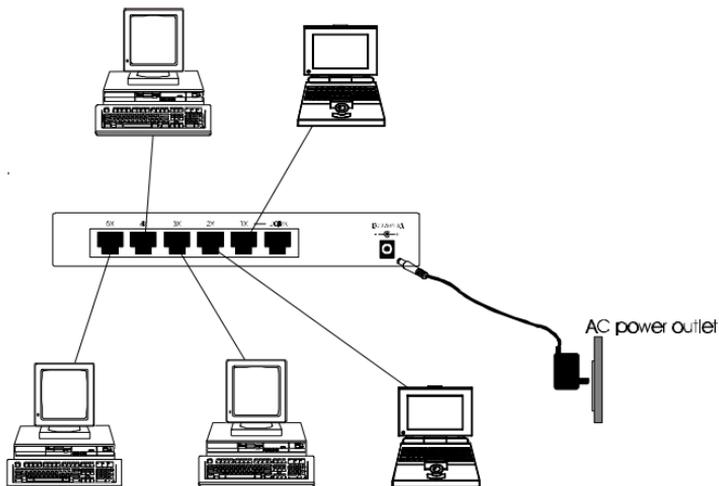
Each Ethernet connection requires a Category 3 or better UTP cable. It is recommended that you use Category 5 cabling for all connections in order to make it easier to transit all stations to 100Mbps.

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 5/8-port 10/100Mbps 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 through port 2~5, 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.

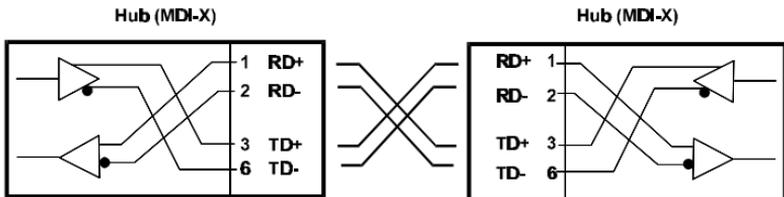
But if port#1 is deployed, the hub-to-hub uplink connection maximum length up to 100-meter

Also, you can uplink more than two hubs without Fast Ethernet Class II repeater count limitation. The Hub can expand the network without additional Ethernet switch.

The following table describes different methods of linking hubs:

HUB PORT USED	DEVICE	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:





## A

# CABLES AND CONNECTORS

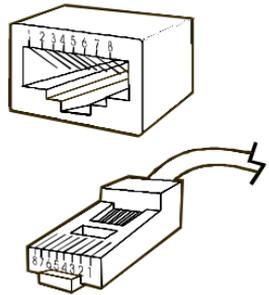
## 100BASE-TX Fast Ethernet Cables and Connectors

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).

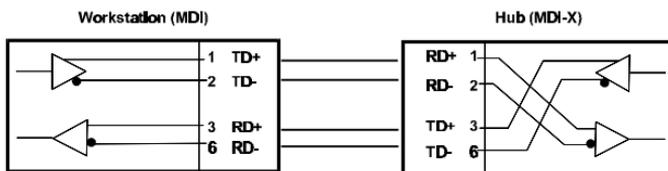
Maximum segment length: 100 meters

Maximum network diameter: 205 meters (without extension function)

Connectors: RJ-45



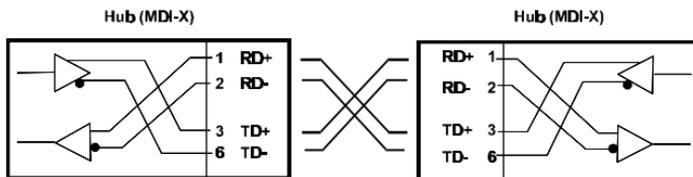
Straight Twisted-Pair Cable Pinouts		
Contact	MDI-X Signal	MDI-II Signal
1	RD+ (receive)	TD+ (transmit)
2	RD- (receive)	TD- (transmit)
3	TD+ (transmit)	RD+ (receive)
4, 5	Not used	Not used
6	TD- (transmit)	RD- (receive)
7,8	Not used	Not used



## 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:





---

# 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:** 5/8, 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 (on extension switch mode the maximum length up to 100 meters) for hub-to-hub linking

## LED Indicators

---

**Hub Status:** Power, 10Mbps collision, 100Mbps collision.

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

---

## Environmental and Physical

---

**Power Adapter:** AC external power adapter. Output  
7.5DC/1A

**Power Consumption:** 7.5 Watt. (max.)

**Dimensions (W ´ H ´ D):** 191mm × 98mm × 29mm

**Operating Temperature:** 0 to 50°C

**Storage Temperature:** -20 to 70°C

**Humidity:** 5% to 90% (non-condensing)

**Emissions:** FCC Class A, CE Mark