NOVA100 Series

DHR-800
DHR-800P

19" Modular/ Expandable
Dual-Speed Stackable Hub

Trademarks

FCC Warning

This equipment generates and uses radio frequency energy. If it is not installed and used properly in strict accordance with the manufacturer‘s instructions, it may cause interference to radio and television reception. It has been type-tested and found to comply the specifications in sub-part J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. There is no guarantee that interference will not occur in a particular installation. If this equipment does cause 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:

Re-orient the receiving antenna

- Relocate the computing device with respect to the receiver
- Move the computer away from the deceiver
- Plug the computer into a different outlet so that computer and receiver are on different electrical circuits.

If necessary the user should consult the dealer or an experienced radio or television technician for additional suggestions.

Revision

The information in this manual is subject to change without notice.

User's manual for PLANET Nova 100 Series,

For models: DHR-800/DHR-800P.

Rev 1.20 (Jul. 1998)

Part NO. EMHDHR800v2

Table of Contents

1. Introduction

About This Guide

Thank you for purchasing PLANET NOVA100 10/100Mbps Dual Speed Ethernet Hub – DHR-800/DHR-800P. Compact in size and lightweight, utilizing the latest VLSI technology to provide high reliability levels, the units provide a flexible approach to hub deployment.

In this user's guide, you will learn product characteristics, it's features, and also some basic installation concepts. Please read the following section carefully before your installation.

Checklist

Carefully unpack the package and check its contents against the checklist given below.

- 10/100BASE-TX Dual-Speed Ethernet hub:
  Primary Model – DHR-800P
  Secondary Model – DHR-800
- User‘s manual
- Power Cord
- Accessories

Please inform your dealer immediately for any wrong, missing, or damaged part if possible, retain the carton including the original packing materials, and use them against to repack the product in case there is a need to return it to us for repair.

Product Features

1. DHR-800P/DHR-800 is a 8-port modularized 19" Rack mount 10/100Mbps Dual Speed Ethernet Stackable Hub, complies with the IEEE802.3 10Base-T and IEEE802.3u 100Base-TX Class II standard.
2. DHR-800P and DHR-800 are the same product series and can stack with each other.
   - DHR-800P is the 8-port Dual-Speed Ethernet Hub with internal switching module – called "Primary Hub"
   - DHR-800 is the 8-port Dual-Speed Ethernet Hub without switching module – called "Secondary Hub"
3. At rear panel, provide two stacking ports for stacking up to 3 units max. This type of connection has no sacrifice ports.
4. DHR-800P provides switching function to bridge between the 10Base-T segment and 100Base-TX segment.
5. DHR-800 provide two speed auto-negotiation, but 10Base-T and 100Base-TX segments can not communicate with each other, except by stacking with DHR-800P primary model.
6. At the front panel, one additional RJ-45 Uplink port can be cascaded to a hub by using straight-through cable.
7. Two Expansion Slots for multiple purpose networking, network expansion and extension
8. LED indicators array for simple diagnostics and management

About Fast Ethernet

This hub is technically known as a 100Base-TX Class II Fast Ethernet hub. This Section describes what this means in practical terms.

· Ethernet Standards and Operation Speeds

The standards of the Ethernet are defined by the Institute of Electrical and Electronics Engineers (IEEE). The standard for traditional Ethernet using hubs and twisted-pair cables is known as 10Base-T. Traditional Ethernet works at a signaling speed of 10Mbps, that is, ten megabits (slightly more than a character) per second. The Base in 10Base-T stands for "baseband," a one-bit-at-a-time signaling method; the T stands for twisted-pair cables.

Fast Ethernet was developed to meet the demand for increased "bandwidth," in other word, greater data-carrying capacity. A fast Ethernet hub works at 100Mbps, ten times the speed of a 10Base-T hub.

The IEEE had defined several Fast Ethernet Standards. The hub complies with the 100Base-TX standard: 100Mbps baseband signaling on twisted-pair cables, with signals crossing from the Transmit lines to the Receive lines somewhere between each pair of communication end nodes.

· Fast Ethernet Hub Classes

This hub is a Class II Fast Ethernet hub. This means two things:

1.It will work with Fast Ethernet interface cards of one type only, and
2.It can be connected to another hub for the purpose of expanding the network.

Note: A Class I hub will work with more than one type of Fast Ethernet interface card, but cannot be connected to another hub.

· 100Base-TX Fast Ethernet Cabling

The twisted-pair cables used for traditional Ethernet and Fast Ethernet all look the same on the outside. Such cables, however, come in different grades and with different wire arrangement, and can have different kinds of sheathing.

The kinds of cables that can be used with a 100Base-TX Class II Fast Ethernet hub are

- Category 5 unshielded twisted-pair cable, and (Category 5 UTP)
- Type 1 shielded twisted-pair cable (Type 1 STP)

・100Base-TX Fast Ethernet Summary

Be sure to remember the following rules about a 100Base-TX Class II Fast Ethernet hub:

1. All end nodes connected to the hub must have 100Base-TX Fast Ethernet interface cards.
2. Only Category 5 UTP or Type 1 STP cables may be used to connect and nodes to the hub. The cables must be straight-wired.
3. To expand a network built around one Fast Ethernet hub, you can connect the hub to one and only one other 100Base-TX Class II hub.

2. Installation

Hardware Description

This product series provide two different running speed – 10Mbps and 100Mbps in the same hub and automatically distinguish the speed of incoming connection and group the same speed ports in a network segment, i.e., each port has auto-negotiation Nway function.

Both DHR-800P and DHR-800 products have dual-speed Nway function, but only DHR-800P with switching function to bridge 10Mbps and 100Mbps segments.

The DHR-800 series product can stack up each other, but in a stack only **ONE** DHR-800P primary hub is allowed. It means that in a stack you can have several DHR-800 hubs then all ports with dual-speed auto sensing function, but 10Base and 100Base segments can not link together. Now by adding one DHR-800P hub to this stack, 10 and 100 segments can communicate through inside switch module.

This section describes the important parts of the 10/100BASE-TX Dual-Speed Ethernet hub. It presents front panel and rear panel drawings of the product showing the LED indicators, connectors, and switches.

· Front panel

The following figure shows the front panel of 8-port 10/100BASE-TX Dual-Speed Ethernet hub.

Fig 2.1 DHR-800P front panel

Note: The difference between DHR-800 and DHR-800P is on the plastic

label on front panel. The model number and character “Primary” is for DHR-800P.

There are 8 RJ-45 jacks on the front panel. Each jack is labeled with a port number.

All ports‘ Transmit and Receive lines are crossed within the hub (ie. 1-8 ports are MDI-X ports). A 10/100BASE-TX port must be internally cross-wired to let you connect an end node using straight-wired cabling.

A special RJ-45 connector is converted from the 1st port as “Uplink” port (MDI-II port). The “Uplink” port is used for connecting another hub through an ordinary straight-wired twisted-pair cable by running one end of straight cable to “Uplink” port and the other end to another hub‘s normal port.

One expansion slots for optional module installation.

· LED Indication

On the front panel, there are several LED indicators for monitoring the device itself, and the network status. At a quick glance of the front panel, the user would be able to tell if the product is receiving power; if it is monitoring another hub or concentrator; or if a problem exists on the network.

The following table describes the function of each LED indicator

.

LED	Color	Label	Function
Power LED	Green	PWR	This LED light is located at the left side on the front panel. It will light up (ON) to show that the product is receiving power. Conversely, no light (OFF) means the product is not receiving power
Collision LED 10Mcol 100M col	Red	COL	A "collision" in Ethernet, is when two end nodes transmit at the same time. The indicator lights up whenever there is a collision between a directly attached end node and any other node

LED	Color	Label	Function
Port's Link/Act	Green	Link Act	Each RJ45 MDI-X port on the hub is assigned an LED for monitoring port "Good Link" and data traffic. It is the upper one. The LED is normally OFF after the power on operation, but will light up steadily to show "Good Link" when port is been connected. The LED will flash rapidly to show data passing in and out the port.
Port's Speed **Base Unit** **Slot 1*** **Slot 2***	Orange	100Mbps	Each RJ45 MDI-X port on the hub is assigned an LED to indicate the running speed. It is the lower one. If the connection is running at 100Mbps, the LED will keep "On", otherwise, keep "Off" when it is at 10Mbps state

***Note**: As soon as the module with fiber port(s) installed, the Speed LED of the related port will turn on to indicated the 100Base-FX port runs at 100Mbps though there is no connection. Please also refer to the module's guide for the LED status of the module.

· Rear Panel

On the rear panel there are power inlet, fans, expansion slot and stack connectors. The following describes the function of each connector and

switch.

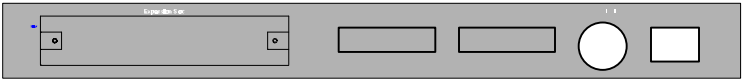

Fig 2.2 DHR-800/DHR-800P rear panel

AC Power inlet

The power cord should be plug into this socket. The AC power require 100~240VACm 50~60Hz auto-sensing power supply.

Stack Connectors

There are two DB-25 connectors at rear panel with same pin definition and function. These connectors are for stacking up several hubs to expanding the station ports. By driving one end of cable to anyone connector of one hub and the other end to another hub's stack connector.

Expansion Slot

There is one expansion slot for optional module installation, for more about the module, please refer to the installation guide of the module.

Hardware installation

After selecting an appropriate location, you are ready to connect it. This section covers important rules regarding Fast Ethernet connections, and describes how to connect the hub to end nodes, another hub, and power supply.

· General Rules

Before making any connections to the hub, note the following rules:

♦ All network connections to the hub must be made using Category 5

UTP or Type 1 STP cables. Do not use similar-looking Category 2 or 3 cables or "flat satin" telephone cords.

♦ No more than 100 meters (about 328 feet) of cabling may be used between the hub and an end node; no more than 5 meters (16.4 feet) may be used between two stacks. Each stack is composed up to 2 hubs max. Under this limitation, no more than 205 meters of cabling may be used between any two end-nodes.

♦ To expand your network, you have three methods:

- First -- you can connect the hub to another 100BASE-TX Class II Fast Ethernet hub, but not to more than one, and not to any other kind of hub through "Uplink" port. These two hubs can come from different suppliers.

- Second -- you can connect the hub to another hub by stack connector. The function of stack connector is defined by manufacture, therefore, different vendor supplied hubs car not be connected together.

- Third -- Two stacks can connect together by using method one, i.e. choosing one station port from the first stack and one "Uplink" port from another stack, and linking these two ports within 5 meters (16.4 feet) length.

· Connecting End Nodes

LAN end nodes such as single-user computers, servers, bridges, and routers must be connected to the 1 to 8 ports (MDI-X port) ports using straight-wired high-grade (Category 5 unshielded or Type 1 shielded) twisted-pair cabling.

- We recommend starting with the higher-numbered ports when connecting Ethernet LAN and the new hub does not have an "Uplink" port or switch, you will have to use "Uplink" port on the hub for the connection.

- We also recommend making sure the end node is turned off before plugging the cable in for the first time. If the plug does not fit well

and the nose‘s LAN board is loose, forcible insertion can momentarily break an internal contact and damage the end node.

Followings are step-by-step instructions for connecting an end node to the hub using straight-wired twisted-pair cable.

1. Select a port on the hub
2. Plug one end of the cable into the node‘s RJ-45 jack.
3. Plug the cable‘s other end into the selected RJ-45 jack on the hub.

To test and end-node connection, connect the hub to power, then turn the hub and the end node on. The link indicator for the port should shine steadily. If it does not, check the cable and all connections.

· Stacking two Hubs

Two hubs can be connected by using a attached stack cable – 25-pin D-sub cable.

1. Power off the two hubs, stack the two devices together.

2. Connect one end to stack port of hub.

3. Connect the other end to another stack port of another hub (from "UP", to "Down"). Then power they on. These two hubs are stacked together as in one collision domain.

· Connecting the Hub to Another Hub by Uplink port

You can connect the hub to another 100Base-TX Class II Fast Ethernet hub or 10Base-T Ethernet hubs using a twisted-pair cable. Never, connect to another hub that already cascade with another Fast Ethernet hub or already cascade with 4 Ethernet hubs.

Make the connection as follows:

1. Make sure “Uplink” port on the hub is free.
2. Plug one end of the cable into “Uplink” port on the hub.
3. Plug the cable‘s other end into the available port (except “Uplink” port) on the cascaded hub. Remember that, up to 5 meters (16.4 feet) UTP cable is allowed for Fast Ethernet Hub. 100meter (328 feet) for another Ethernet hub or any switch hub/port.

· Installing the modules into the Hub

You can expand / extend the hub and networks after slide in the modules into the hub's two expansion slots, the available modules including:

- 8-port TP 10/100Base-TX Auto-Sensing
- 4-port TP 10/100Base-TX Auto-Sensing, with ONE switching port
- 4-port ST/SC 100Base-FX Class II fiber-optic
- 1-port ST/SC 100Base-FX Class II fiber-optic, and 3-port 10/100Base-TX Auto-sensing

Make the connection as follows:

1. Power off the Hubs, remove the two screws of the expansion slot cover
2. Slide-in the modules into the slot with care
3. Secure the two screws to the hub.
4. Connect the connectors to the modules and power on the hub

For more information about the modules, please refer to the Installation Guide of the modules.

· Connecting the Hub to AC Power

After making network connections as described in the preceding sections, you are ready to plug the hub in and turn it on.

The hub can run on AC power with AC 100~240 Volt auto-sensing, 50~60Hz.

Before plugging the hub in, please make sure:

1. The AC power cord is long enough to reach an AC wall outlet of an approved type.
2. The power cord has plugs that match both the hub‘s power inlet and the type of wall outlet you will use
3. Attach the plugs firmly to both the wall power inlet and hub's before turn the power-switch to ON, ie: "I" position.

Hardware Troubleshooting

Symptom: Link indicator remains off

Causes: Workstation‘s network adapter, cable or hub port is defective.
Solution: The most common cause is a defective network adapter or cable connection. Check the corresponding cable connections, or the workstations network adapter for possible defects. Verify

that the correct cable type is being used. (Note that crossover cable is only required if you cascade hubs via RJ45 station ports, i.e. an Uplink port is not used.) Replace the defective cable or adapter.

Some network adapter‘s link indicator need to be initialized by software driver. Therefore, if no driver is pre-loaded, the hub‘s link indicator will remain off even the connection completed.

Appendix A
Specifications

Model	DHR-800P, DHR-800
Network Protocols	IEEE802.3 (Ethernet), 10Base-T IEEE802.3u (Fast Ethernet), 100Base-TX
Stackability	3
Placement	19" Rack mount
Internal Bridging	DHR-800P : Yes (10/100Mbps segments bridging) DHR-800* : No, (10/100Mbps segments separated) * Internal bridging enabled once configured as part of a stack with a DHR-800P Primary hub
LED Indicators	System : Power and 10M Col, 100M Col 10/100Mbps speed Indicators per port Individual ports : Link, Activity
Transmission Rate	10 / 100Mbps
Cable types	100Base-TX : UTP/STP Category 5 cable 10Basee-T : UTP/STP Category 3 or 5 cable
Connectors Supported	8+1 STP ports (10/100Mbps Auto-Sensing) 2 Expansion Slot 2 DB-25 ports (Hub Stack)
Power Requirment	100~240 VAC, 50~60Hz
Dimensions (WxHxD)	430 x 220 x 44 mm (16.9” x 8.7” x 1.7”)
Operating temperature	0 - 50 degree C
Storage temperature	20 - 70 degree C
Humidity	10% to 90% RH (Operating) 5% to 90% RH (Storage)
Registrations	FCC Rules, Part 15, Class A , CE-Mark

Appendix B
RJ-45 Pin Assignments

Pin	Hub's Station Ports 1-8 (MDI-X port)	Uplink Port (MDI-II port)
1	Input Receive Data +	Output Transmit Data+
2	Input Receive Data -	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data +
6	Output Transmit Data-	Input Receive Data -
4,5,7,8	Not used	Not used

Schematics for both straight and crossover twisted-pair cable are shown below. (Note that crossover cable is only required if you cascade hubs via the RJ-45 station ports; i.e. the Uplink port is not used.)

Straight-Through/ Crossover Cable

The pin assignment of the cables both ends should be as below:

Straight-through		Crossover	
Hub (MDI-X)	Adapter(MDI-II)	Hub (MDI-X)	Hub (MDI-X)
Pin 1	Pin 1	Pin 1	Pin 3
Pin 2	Pin 2	Pin 2	Pin 6
Pin 3	Pin 3	Pin 3	Pin 1
Pin 6	Pin 6	Pin 6	Pin 2

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