LFH8-S/LFH16-S
Fast Stackable Hubs

Installation Guide

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CHAPTER 1 Introduction

1.1 Product Introduction

Congratulations on your purchase of the LFH stackable 8-port or 16-port Fast Ethernet Hub! The LFH8-S and LFH16-S are designed to give you the ultimate in flexibility, ease-of-use, and reliability.

The LFH8-S and LFH16-S Stackable Fast Ethernet Hubs are 100BASE-TX multiport Class II repeaters designed for use with networks using Unshielded Twisted Pair (UTP) Category 5 cable or Shielded Twisted Pair (STP) cable. The LFH hubs are simple to install, and feature Link/Receive, Partition, and Utilization % LEDs for convenient monitoring of the status of the hub and of each port. The rear panel of each LFH hub features two stacking ports, allowing up to six LFH stackable hubs to be combined as a single repeater. For additional expansion, the LFH8-S/ LFH16-S provides an uplink port that makes it easy to cascade the hub to another Fast Ethernet hub or hub stack.

The LFH8-S/LFH16-S hubs can be placed on a table top or rack-mounted, and provide the ideal solution for small to large 100BASE-TX Fast Ethernet networks. The LFH hubs are designed to comply with the IEEE 802.3u Fast Ethernet standard.

To insure network reliability, the LFH8-S and LFH16-S monitor each port for signal quality and automatically disconnect stations transmitting noise, reconnecting them when the problem is resolved. Data packets that exceed the maximum legal length for IEEE802.3 Ethernet packets are automatically truncated. This prevents a device from blocking the network by transmitting a continuous data stream or excessively long packet. The LFH hubs completely retime and restore full-amplitude waveforms for each retransmitted packet. A full-length preamble is also generated, insuring packet integrity across the network.

1.2 Features

▼ The LFH8-S provides eight 100BASE-TX ports and the LFH16-S provides 16 100BASE-TX ports for Fast Ethernet connectivity

▼ The LFH8-S/LFH16-S comply with the IEEE 802.3u Fast Ethernet standard

▼ Supports Category 5 Unshielded Twisted Pair (UTP) or Shielded Twisted Pair (STP) cable

▼ An Uplink port on the front panel enables the LFH8-S/LFH16-S to be connected to another 100BASE-TX hub using a straight-through cable

▼ The LFH8-S and LFH16-S stackable architectures enable up to 6 hubs to be stacked together for a total of up to 96 ports

▼ Performs preamble regeneration, signal retiming and restoration, extension of fragmented packets, automatic partitioning, and jabber truncation

▼ Global Power and individual port Link/Receive, Partition, and Utilization% LEDs indicate system status

▼ The internal power supply automatically adjusts to the voltage range of the AC power being supplied (100VAC/60Hz to 240VAC/50Hz), with no change in settings or fuse required

▼ The LFH8-S and LFH16-S come with metal brackets that can be easily attached to the hub for mounting in a standard 19 inch equipment rack

▼ FCC Class A, CE, UL, CUL, TUV certifications

▼ Five year limited warranty

1.3 Product Specifications

Standards	IEEE 803.3u 100BASE-TX Ethernet
Network Media	100BASE-TX Unshielded Twisted Pair cabling (Category 5 UTP)
Max. Lengths	100 meter hub-to-station connection 5 meter hub-to-hub connection
Connectors	8/16 RJ45 100Mbps ports, one crossover "Uplink" port Two 25-pin stacking connectors
Stackable	Maximum 6-hub stack, stacking cable included
LED indicators	Power, Partition, Link/Receive and Utilization indicators
Dimensions	356mm x 230mm x 44mm (L x W x H)
Environment	Temperature: Operating: 0°C to 40°C Storage: -20°C to 70°C
Humidity	Operating: 10% to 90% RH
Power	100 VAC/60Hz to 240 VAC/50Hz
Certifications	FCC Class A, CE, UL, CUL, TUV
Warranty	5-year limited

Chapter 2 Installing the LFH Hub

2.1 Packing Checklist

Your LFH package should contain the following:

✓ An LFH8-S or LFH16-S Fast Stackable Hub

✓ One AC Power Cable

✓ One 25-pin cable for stacking LFH hubs

✓ Mounting brackets and screws

✓ Four self-adhesive standoffs

✓ Rackmount brackets and screws

✓ Installation Guide

If any of these items are missing, contact your dealer immediately.

2.2 Planning 100BASE-TX Networks

100BASE-TX networks need to be planned out slightly differently from 10BASE-T networks, because new hubs and new wiring configurations are necessary. (10BASE-T hubs are incapable of sending or receiving data at 100Mbps, so a 100BASE-TX network requires a 100BASE-TX hub.)

100BASE-TX supports a maximum length of 100 meters from a network station to a hub.   The total network diameter (the maximum cable distance between any two stations on the network) is 205 meters for 100BASE-TX, as opposed to 500 meters for 10Mbps Ethernet. Because 100BASE-TX sends signals ten times faster than 10BASE-T, the collision window (the time during which the network can detect a collision between packets) is reduced to one-tenth the duration of the 10BASE-T collision window, making the maximum network diameter smaller.

In a repeater environment, 100BASE-TX only allows a single layer of cascaded hubs.

Switching hubs, such as Lantronix's LSW8FA, may increase the network diameter for 100BASE-TX networks by buffering data packets. Each port can be connected to a separate LAN segment, each with a maximum diameter of 205 meters, thereby increasing the overall 100BASE-TX network diameter.

Not only does 100BASE-TX have a different data transmission scheme, it also has different cabling requirements. As noted above, 100BASE-TX requires data-grade (Category 5) UTP cable.

Some installations have Category 5 cabling but do not have wall outlets and wiring closet punch-down blocks that meet Category 5 requirements. 100BASE-TX requires that all wiring and accessories meet EIA/TIA 568B specifications for proper operation. When wiring a 100BASE-TX network, make sure that the entire cable plant meets specifications.

2.3 Installation

The LFH Stackable Fast Ethernet Hubs are easy to install and require no special training. You should, however, read the following instructions carefully before proceeding to install your hub. Figures 2-1 and 2-2 show the layout of the front panels.

Figure 2-1 LFH8-S Front Panel

Figure 2-2 LFH16-S Front Panel

The LFH Stackable Fast Ethernet Hubs were designed for easy "plug and play" installation. Before you connect the LFH to other devices, there are several issues you should keep in mind:

▼ When connecting the LFH to a workstation using unshielded twisted pair cable, you must make sure that the cable length is not greater than 100 meters

▼ When you connect two LFH Fast Ethernet hubs or hub stacks together, you must make sure that the link between them is no longer than 5 meters

▼ Network cable segments can be connected to or disconnected from the LFH hub while the power is on. Plugging in or removing network cables while your hub is operating will not interrupt the operation of the hub

▼ When placing your LFH hub, you need to avoid dusty locations and electromagnetically noisy areas

2.4 Mounting

Your LFH8-S or LFH16-S hub is delivered with two brackets for mounting the hub in an EIA standard 19 inch rack. Secure the mounting brackets onto the sides of the hub, fastening them with screws as shown in Figure 2-3.

Figure 2-3 Mounting Bracket Installation
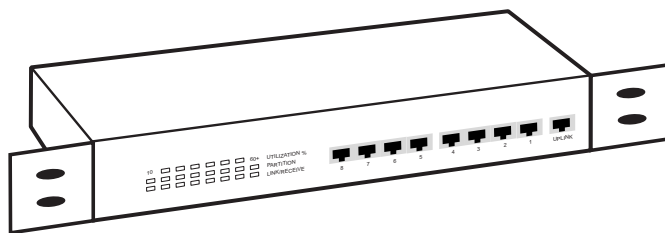
If your site uses only a few hubs and is not equipped with a mounting rack, you may choose to place the LFH hub on a table or wiring closet shelf. In this case, use the four self-adhesive rubber feet, which are provided with the hub for cushioning purposes. Stick them at the four corners of the bottom surface of the hub to cushion it against vibration.

2.5 Stacking LFH8-S/LFH16-S Hubs

You can stack up to six LFH8-S/LFH16-S hubs together using the special connectors on the back panel. A single stack can contain a mixture of 8-port and 16-port hubs. The maximum allowable any of LFH8-S and LFH16-S hubs in a stack are 6 hubs.

When the LFH hubs are stacked together they are counted as a single Fast Ethernet repeater, and the entire stack can be chained as a unit to another Class II hub or hub stack.

To stack two LFH8-S/LFH16-S hubs together (see Figure 2-4):

1. Position the LFH hubs with one on top of the other.

2. Connect one end of the stacking cable to either one of the connectors on the rear of the LFH hub. Make sure the cable snaps firmly onto the connector.

3. Connect the other end of the stacking cable to either one of the connectors on the other LFH hub.

Figure 2-4 Stacking Two Hubs
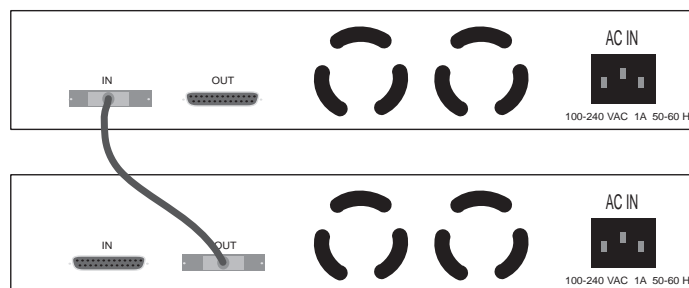
Similarly, to connect six LFH hubs together in a stack (see Figure 2-5):

1. Position the LFH hubs with one on top of another.

2. Connect a stacking cable from one of the connectors on the middle LFH hub to one of the connectors on the top LFH hub.

3. Connect a stacking cable from the other connector on the middle LFH hub to one of the connectors on the bottom LFH hub.

Figure 2-5 Stacking Six LFH8-S/LFH16-S Hubs
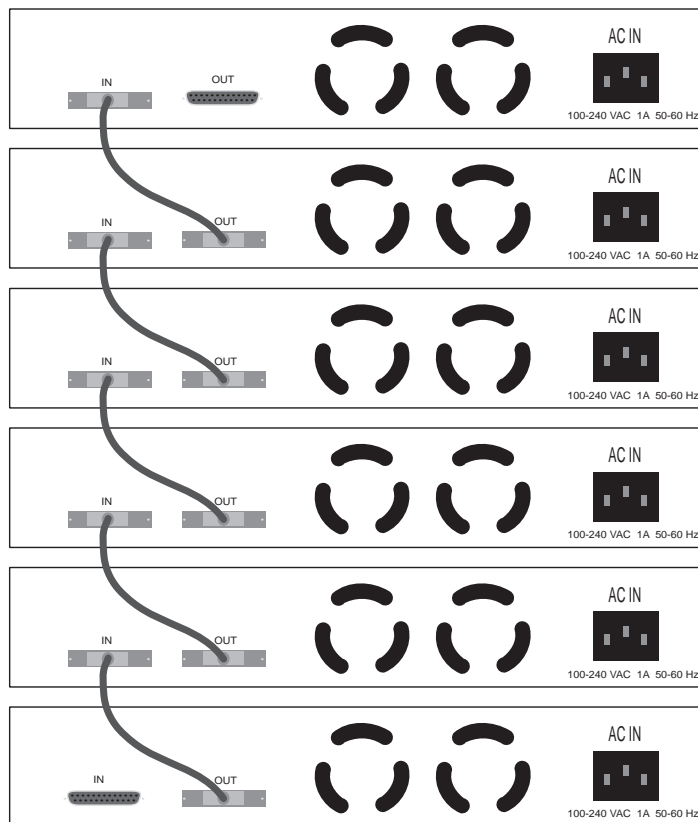
2.6 Connecting the LFH Hub

Use the following procedures to connect 100BASE-TX network devices to the hub:

LFH8-S LFH16-S	Ports 1-8 Ports 1-16	Uplink Port
PC, Workstation	S	C
Server	S	C
Hub, Switch port	C	S
Hub, Switch uplink port	S	C
S = Straight Cable C = Crossover cable		

NOTE: If the Uplink Port is being utilized on the LFH hub, Port "8" may not be used. Conversely, if Port "8" is being utilized, the Uplink Port may not be connected.

The following table describes the two cable types:

|	Straight cable	Crossover cable
Pin 1	TD+	RD+
Pin 2	TD-	RD-
Pin 3	RD+	TD+
Pin 6	RD-	TD-

Make sure that the length of the straight-through cable between the LFH hub and the other device does not exceed 100 meters, including all patch cables and cross-connect wires.

Make sure that the length of the straight-through cable between two hubs does not exceed 5 meters.

Chapter 3 LED Indicators

Figure 3-1 shows the LED indicators which indicate the link status of each of the ports, whether the LFH hub is receiving power, and the presence of network utilization % and partition on the network.

Figure 3-1 LFH16-S Front Panel LED Indicators
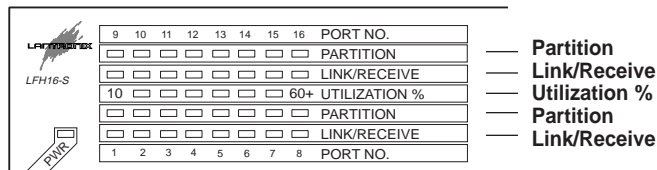
3.1 Power LED

The green LED on the front panel labeled **PWR** is used to indicate that the LFH hub is receiving power and is turned on. If the LED is off, check the following to isolate the problem:

▼ Make sure the power cord is properly connected to the power outlet and is properly inserted into the power connection on the LFH hub

▼ Determine whether or not the outlet is functional by plugging another device into the receptacle

3.2 Partition LED

The yellow Partition LED is located on the front panel and labeled as **Partition**. When there are too many collisions received from a specific station(s), the hub will automatically partition it to prevent data transmission to those specific ports. When this port is partitioned, the LED will be turned on.

3.3 Link/Receive LEDs

The Link/Receive LEDs on the front panel are associated with individual ports, indicating whether a device is detected on the other end.

The LFH hub monitors each port on the hub to determine whether or not there is a device on the other end. If the cable is connected to a port and a link is detected, the LED will light; otherwise the LED will not light and the transmit and receive functions of the port will be disabled.

3.4 Utilization % LEDs

The Utilization % LEDs is defined to indicate the current traffic utilization of the network. This hub supports 6 LEDs to indicate different traffic utilization levels.

The table below shows the different status indications of the Utilization % LEDs:

10~20%	Green
30~40%	Yellow
50~>60%	Yellow

3.5 System Status LEDs

LED summary table		
PWR	Green	ON=Unit is receiving power
PARTITION	Yellow	ON=Port is partitioned
UTILIZATION	Green/Yellow	Green=10-20% Utilization Yellow= >30% Utilization
LINK/RECEIVE	Green	ON=Link is detected

Limited Warranty

The LFH8-S and LFH16-S come with 5-year limited warranties. To obtain Lantronix's full warranty statement or if you experience problems with your unit, check our website (www.lantronix.com) or call Lantronix for assistance.

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Technical Support

If problems occur during product operation, please check the hub configuration settings, cables, connectors, network terminators and other network components for compatibility.

Write a description of the problem, including what problems occurred and when they occurred. Also, please have the following information ready if calling for support services:

Model number & serial number
Purchase date
Network configuration
Application environment
Hardware, software (NOS) and the DOS version

Contact Lantronix technical support at 800-422-7044 within the United States or 949-453-3990 outside of the United States. Lantronix's technical support can also be reached via email at support@lantronix.com, and via www.lantronix.com or via fax at 949-450-7226.

WARNING!

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including that which may cause undesired operation. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his or her own expense, will be required to take whatever measures may be required to correct the interference.

NOTE: The RJ45 ports are not for telephone use.

CAUTION:

Not for installation in air ducts, plenums or other environmental air handling spaces. Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

Declaration of Conformity

(according to ISO/IEC Guide 22 and EN 45014)

Manufacturer's Name: Lantronix

Manufacturer's Address: 15353 Barranca Parkway
Irvine, CA 92618 USA

declares, that the product:
Product Name: Fast Stackable Hubs
Model Number: LFH8-S, LFH16-S

conforms to the following standards:

EMC:	EN55022(1988)/CISPR 22(1985)	Class B
	EN60555-2(1987)	Class A
	prEN55024-2(1990)/IE801-2(1991)	4KV CD, 8KV AD
	prEN55024-3(1991)/IE801-3(1984)	3V V/m
	prEN55024-4(1992)/IE801-4(1988)	1KV - (power line) 0.5KV - (signal line)

Manufacturer's Contact: Director of Quality Assurance
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