![BLACK BOX NETWORK SERVICES]

2-Port Hub Type 1
2-Port Hub Type 3 Unshielded
2-Port Hub Type 3 Shielded

FEDERAL COMMUNICATIONS COMMISSION
AND
CANADIAN DEPARTMENT OF COMMUNICATIONS
RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

Contents

1. Specifications

Electrical

Phantom Circuit —

Operating Voltage: 3.5 to 7 V
Operating Current: 1.0 mA @ 5 VDC
Resistance TX to RX: 4.8 ±0.2 kΩ
Insertion Time: 5 seconds maximum
Removal Time: 30 to 100 milliseconds
Note: TX and RX apply to each lobe.

Insertion Loss (maximum) —

	0.5 to 4 MHz	4 to 16 MHz	16 to 32 MHz
Sub TX to Sub RX	0.65 dB	1.3 dB	2.6 dB
Main RX to Sub RX	0.65 dB	1.8 dB	3.7 dB
Sub TX to Ring	0.85 dB	1.8 dB	3.7 dB

Crosstalk (maximum) —

	10 KHz	0.5 to 4 MHz	4 to 16 MHz
Sub TX to Sub RX	55 dB	43 dB	37 dB
Sub Wrap to Main	50 dB	40 dB	35 dB

Return Loss (minimum) —

1 to 6 MHz	6 to 12 MHz	12 to 24 MHz
20 dB	14 dB	11 dB

Common Mode Rejection (minimum) —

1 to 6 MHz	6 to 12 MHz	12 to 24 MHz
40 dB	28 dB	25 dB

Connectors — LT7000A: 3 IBM® data connectors; LT7001A: 3 unshielded RJ-45 connectors; LT7002A: 3 shielded RJ-45 connectors

Power — The Hub is a passive device—it needs no power.

Physical

Indicators — (2) Red LEDs indicating lobe activity

Temperature — 32 to 122° F (0 to 50°C)

Humidity — 0 to 90%, noncondensing

Size — 1.75"H x 6.5"W x 1"D (4.4 x 16.5 x 2.5 cm)

Weight — 0.66 lb. (0.3 kg)

2. Introduction

The 2-Port Hub is a 2-port expandable lobe extender that connects two workstations to a single wall outlet in your existing 16- or 4-Mbps Token Ring network. The Hub is especially suited for applications where workstations are frequently relocated or added to the network.

Here's how it works: The "Ring" port of the 2-Port Hub is connected by a patch cable to the existing Token Ring wall outlet. The two workstations are connected, via station cables, to ports 1 and 2 of the device.

The Hub supports 4- or 16-Mbps networks and complies with IEEE 802.5 standards. It's available with IBM Type 1 connectors (LT7000A), unshielded RJ-45 modular jacks (Type 3) (LT7001A), and shielded RJ-45 modular jacks (Type 3) (LT7002A). See Figure 1.
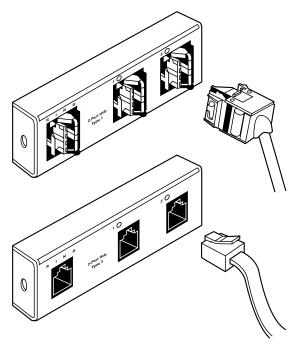

Figure 1. IBM Type 1 and RJ-45 Connectors.

The 2-Port Hub's primary application is to double a single lobe's capacity. Using the 2-Port Hubs for a cluster of terminals improves reliability and reduces maintenance costs. In case of a malfunction in one of the 2-Port Hubs or one of the workstations attached to the MAU lobe, the hub and its stations will be removed from the network, without requiring a backup ring. This eliminates the additional cable length that would have been necessary if another MAU was used.
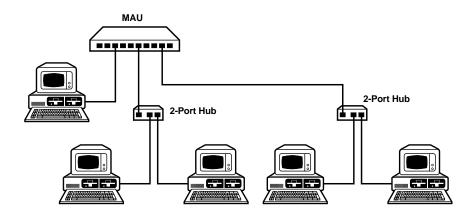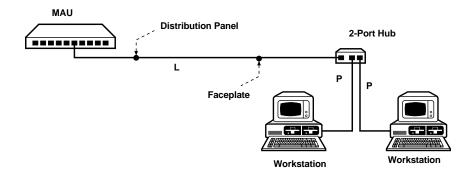
Figure 2 shows a typical 2-Port Hub application.

Figure 2. A Typical 2-Port Hub Application.

Figures 3 and 4 show how to calculate maximum cable lengths. The main Lobe cable (L) is running between the distribution panel (located at the wiring closet) to the faceplate (located at the workstation's area). The Lobe cable is generally IBM Type 1, while all patching cables (P) are IBM Type 6 for the LT7000A. Alternately, other cables, such as low-cost unshielded IBM Type 3, can be used (for the LT7001A) or STP (for LT7002A).
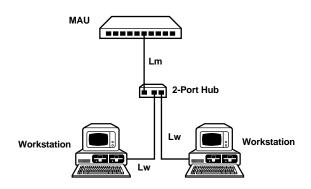
L max ≤ 62 m with IBM Type 1
L max ≤ 30 m with IBM Type 3

All P cables assumed to be 8-foot (2.4-m) IBM Type 6 Patching Cables

Figure 3. Maximum Cable Lengths.

(Lm + Lw)max ≤ 75 m with IBM Type 1
                          35 m with IBM Type 3

Figure 4. Maximum Cable Lengths.

MOUNTING THE HUB IN A RACK

The Hub's compact (1U high and 1 inch deep), lightweight design makes it ideal for wallmounting. Wallmounting brackets and screws are included with the 2-Port Hub.

Installation is simple. Once you've decided where you'd like to put your 2-Port Hub, screw the two screws (included) into the back plane of the bracket. Position the Hub in between the 2 "arms" of the bracket and hold it there while placing a screw through the left side of the bracket. This will screw into a pre-cut hole in the side of the 2-Port Hub. Repeat the procedure on the right side. Installation is complete. See Figure 5, below, for more guidance.
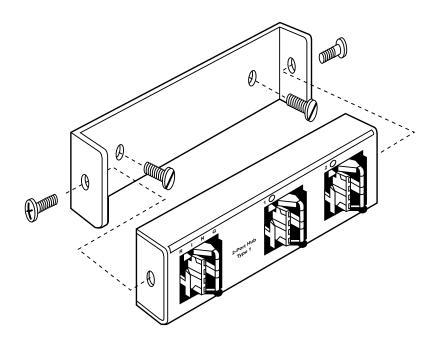
Figure 5. Wallmounting the Hub.

3. Installation

3.1 Unpacking

1. When you unpack the 2-Port Hub, inspect it for damage. If you find any signs of damage, notify your carrier immediately.

2. Check to see that you have these items:

   • One 2-Port Hub

   • Wallmount bracket and screws

   • This instruction manual.

   If anything is missing, call your dealer right away.

3. You will need a relay (setup) tool to install the 2-Port Hub. The LT037 (our part number) is a small universal relay tool. If you have a tool that has the appropriate connector (IBM data connector for use with the LT7000A; an RJ-45 for use with the LT7001A or LT7002A) for use with the 2-Port Hub, you may want to use that instead. If you have the 2-Port Hub Type 3 Unshielded (LT7001A) or Shielded (LT7002A), you will also need a Data Connector to RJ-45 Adapter (our part number FJ017) and a 4-Pair Telco-Type Cable (our part number EVNSL10). See **Section 3.3, Setup Procedure**.

3.2 Site Preparation

For the LT7000A: The cable between the 2-Port Hub and the MAU lobe should have a standard four-position data connector at the MAU end and a standard data connector at the 2-Port Hub RING end (our part number EVNTRPC). The cable between the 2-Port Hub and the workstation should have a standard data connector at the 2-Port Hub SUB end and a standard DB9 male connector at the workstation's end (our part number EVNTRD9).

For the LT7001A and LT7002A: The cable between the 2-Port Hub and the MAU lobe should have standard RJ-45 connectors at both ends (our part number EVNSL10). The cable between the 2-Port Hub and the workstation should be a standard media filter with RJ-45 connectors at both ends (our part number LT056A). See Figures 6 through 8 for cable wiring.
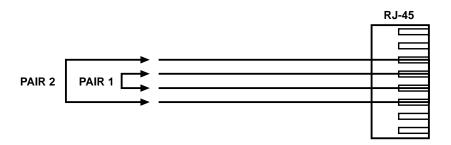
RJ-45

PAIR 2 **PAIR 1**
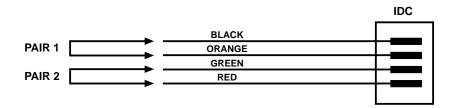
Figure 6. RJ-45 Connector.

IDC

PAIR 1
BLACK
ORANGE
GREEN
PAIR 2
RED

Figure 7. IDC Connector.

DB9 MALE

IDC

5

9

BLACK
PAIR 1 ORANGE
GREEN
PAIR 2 RED
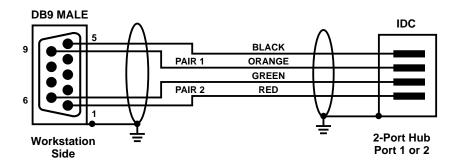
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1

**Workstation
Side**

**2-Port Hub
Port 1 or 2**

Figure 8. Workstation to 2-Port Hub Connection for STP.

3.3 Setup Procedure

Before connecting the 2-Port Hub to the workstations and the MAU, use the LT037 pre-installation setup tool (not supplied), or its equivalent, as follows:

1. Connect the LT037 to Port 1 of the 2-Port Hub for about 10 seconds.

2. The LED should light up and then fade. You should hear one or two clicks.

3. After the LED has faded completely (approximately 6 seconds), remove the LT037. You should hear one or two clicks.

4. Repeat the same procedure for Port 2. Remove the LT037. This time, you should hear a single click.

3.4 Electrical Installation

The 2-Port Hub does not require external power; only data cables should be connected to the unit. Connect the cable between the unit's port connector (Port 1 or 2) and the Token Ring Adapter Card port.

4. Operation

Once you've installed the 2-Port Hub, you can leave it to work entirely unattended. Each port has a red status LED to signal lobe activity. When a workstation logs out or becomes inactive, it's removed from the ring and the corresponding LED does not light.

5. Troubleshooting

Here are some common problems you might encounter with your 2-Port Hub, and some solutions. Read this chapter before calling your supplier.

Symptom: Corresponding LED is ON, workstation remains out of the ring (network).

Action: 1. Disconnect all cables from the unit and repeat the set-up procedures **(Section 3.3)**.
2. Check all cables for proper wiring. Reconnect all cables to the unit and resume operation.
3. If the problem still exists, call your supplier.

Symptom: Corresponding LED is OFF.

Action: 1. Check the cable attached to the port for proper wiring and connections.
2. If the problem still exists, disconnect all cables from the unit and repeat the set-up procedures **(Section 3.3)**.
3. If the problem still exists, call your supplier.

Symptom: LED is flashing; repeating clicks are heard from the unit.

Action: 1. Check if the four-position data connector is connected to the MAU.
2. If the problem still exists, check the cable running from the 2-Port Hub MAIN to the MAU for a possible short circuit. If you find a short circuit, replace the cable.
3. If the problem still exists, call your supplier.

BLACK BOX®
NETWORK SERVICES

1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746