Liebert®
Keeping Business in Business®

MONITORING

INTELLIRACK

USER MANUAL

EMERSON
Network Power

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 Overview 1

1.2 Typical Configuration 2

1.3 Features Overview 3

1.4 Indicators 4

2.0 WHAT'S INCLUDED 5

2.1 Components Shipped With IntelliRack 5

2.2 Other Required Components 5

3.0 INSTALLATION 6

3.1 Installation Considerations 6

3.1.1 Unpacking and Preliminary Inspection 6

3.2 Surface Placement 6

3.3 Rack-Mounting the IntelliRack 7

3.3.1 Materials and Tools 7

3.3.2 Attaching the Brackets 7

4.0 WIRING AND CONNECTIONS 8

4.1 Wiring Specifications 8

4.2 Communications and Power Connections 9

4.2.1 Make a Custom RJ45 Cable—Optional 9

4.2.2 Install MultiPort 4 Cards 9

4.2.3 Connect the UPS—DB9 Port 10

4.2.4 Connect Power to the IntelliRack 10

4.2.5 Daisy-Chain to Another IntelliRack Unit—Optional 11

5.0 SPECIFICATIONS 12

APPENDIX 13

Liebert MultiLink™ Cable Adapter Kit (IRACKMLADPT) 13

Liebert IntelliRack to UPS Cable Kit (IRACKPADPT) 14

Liebert IntelliRack Secondary Cable Extension Kit (IRACKSADPT) 15

FIGURES

Figure 1 Front view 1
Figure 2 Back view. 1
Figure 3 Example of bridging IntelliRack units. 2
Figure 4 IntelliRack connectors and indicators 3
Figure 5 Indicators on front of unit. 4
Figure 6 IntelliRack components 5
Figure 7 Example of IntelliRack unit connections with bridging 8
Figure 8 Power connectors on front of unit 10

TABLES

Table 1 Description of connectors and indicators. 3
Table 2 Indicators summary 4
Table 3 Components shipped with IntelliRack. 5
Table 4 Wiring specifications. 8
Table 5 Pin-out for RJ45 cable. 9
Table 6 IntelliRack specifications 12

1.0 INTRODUCTION

The IntelliRack is a powerful multiplexing device that allows a Liebert UPS of any size to communicate with virtually unlimited number of computers.

The IntelliRack unit has five Intellislots for MultiPort 4 cards that can be connected to as many as four computers each. An IntelliRack unit with five MultiPort 4 cards installed will notify up to 20 computers of power failure and low battery conditions.

A built-in bridging capability permits daisy-chaining IntelliRack units together, accommodating a virtually unlimited number of computers—limited only by the capacity of the UPS.

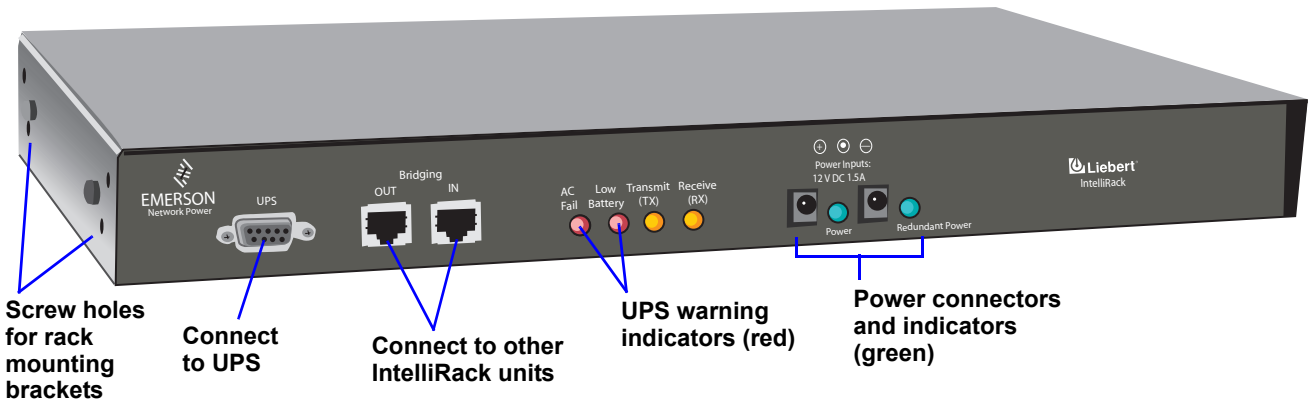
When a power failure or low battery arises in the UPS, the IntelliRack sends notifications to all systems connected to the IntelliRack. One example of a connected system is a network of computers running Liebert's MultiLink™ shutdown software. For other applications, contact your local Liebert representative or call 1-800-222-5877.

1.1 Overview

The IntelliRack features control and indicator lights on the front, as shown in **Figure 1**.

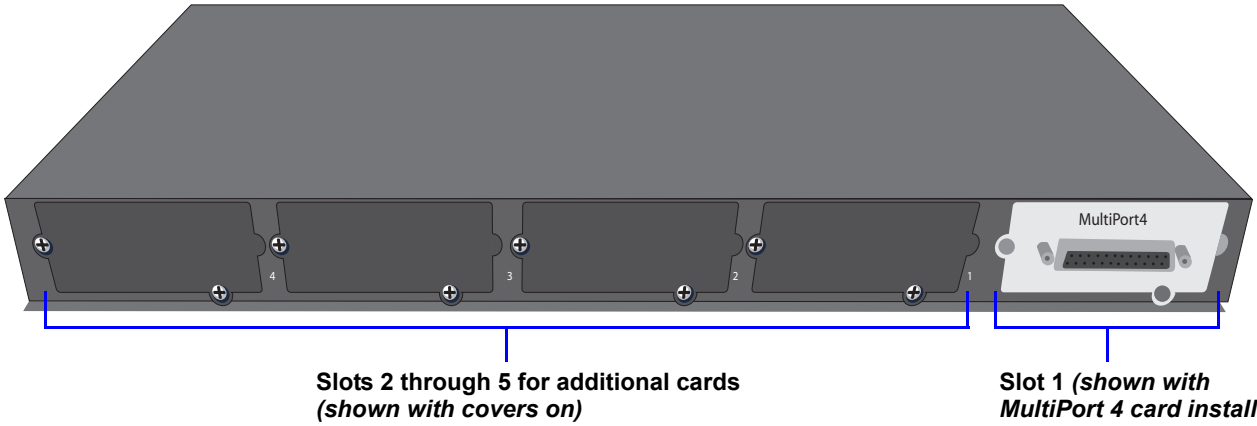
The unit is 16" wide, 9" deep and 1.66" high (406.4 x 228.6 x 42.2mm). The enclosure is made of metal to protect components against environmental debris.

Figure 1 Front view



The back of the IntelliRack has Intellislots for up to five MultiPort 4 cards. **Figure 2** shows the back of the IntelliRack with a MultiPort 4 card installed in Slot 1 and covers over Slots 2 through 5.

Figure 2 Back view

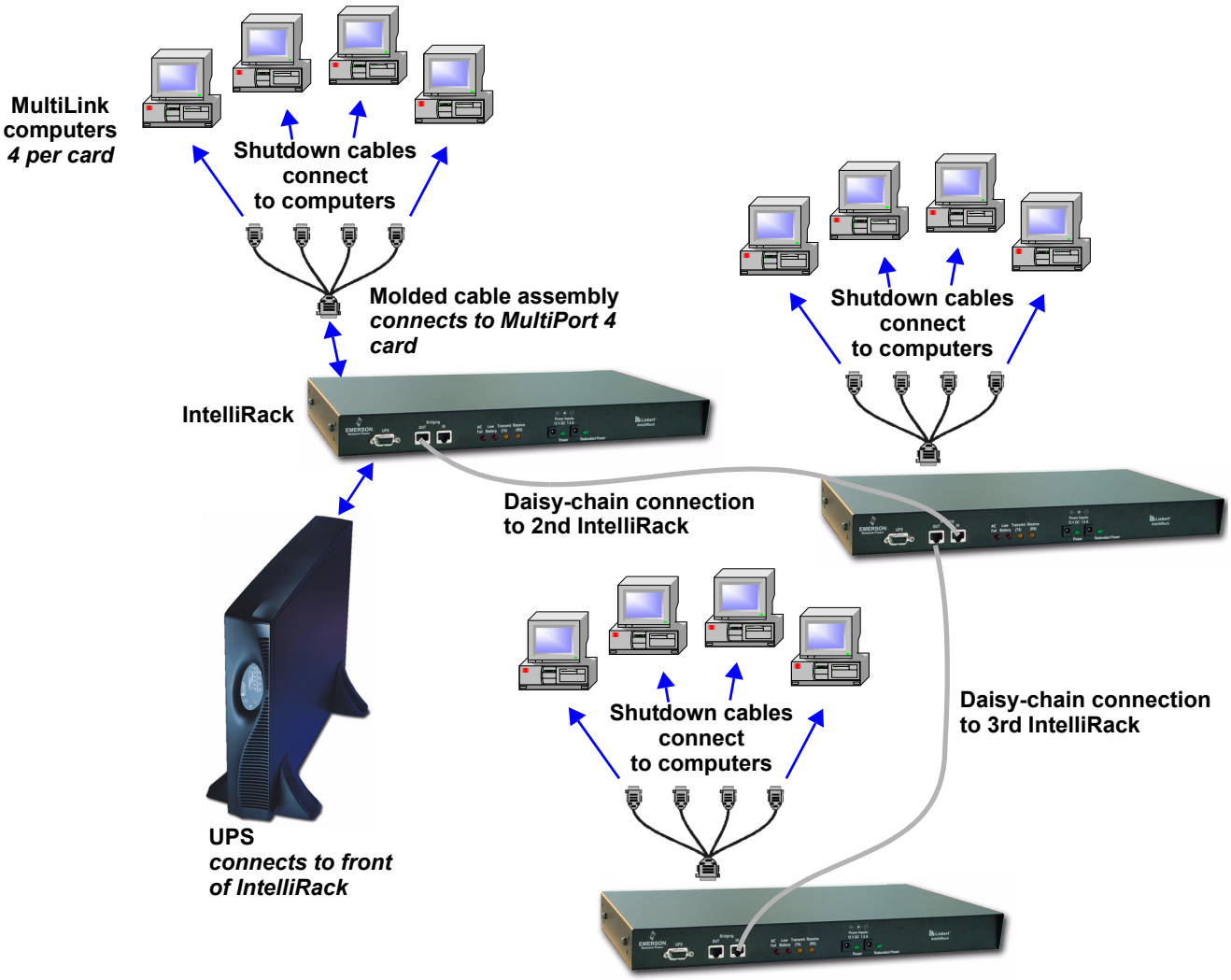


1.2 Typical Configuration

Each IntelliRack is designed for connecting one UPS and as many as 20 computers or other systems through MultiPort 4 cards in the back, as shown below left in **Figure 3**.

Built-in bridging capability allows you to daisy-chain IntelliRack units together, as shown in **Figure 3**, increasing the number of computers that can receive power failure and low battery notifications.

Figure 3 Example of bridging IntelliRack units



1.3 Features Overview

The front of the IntelliRack has a connector for a UPS, two input power sources (primary and redundant) and bridging to another IntelliRack unit. The IntelliRack front also has indicators that display the status of the UPS, as shown in **Figure 4**.

Each side has screw holes that allow mounting the unit in a rack. The IntelliRack has provisions that allow it to be mounted either front-facing or rear-facing.

The rear of the unit has five Intellislots for MultiPort 4 cards to connect to MultiLink computers.

Figure 4 IntelliRack connectors and indicators

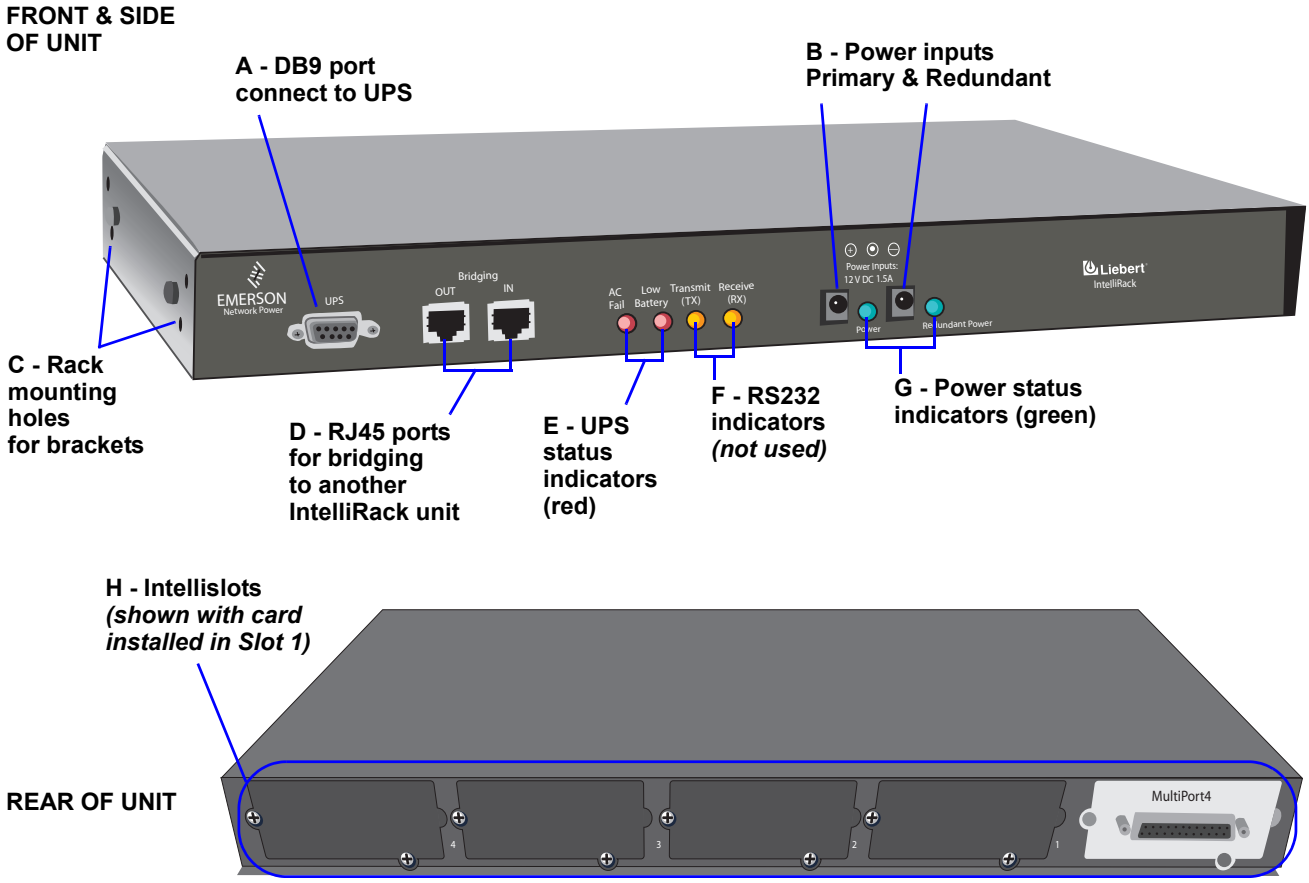


Table 1 Description of connectors and indicators

Item	Description	For more information, see:
A - DB9 port	Connection to the UPS being monitored. Requires use of the three-piece kit with two DB9-to-RJ45 adapters and an RJ45 cable (provided with the IntelliRack).	4.2.3: Connect the UPS—DB9 Port
B - Power inputs	**Primary** - Power connection for the IntelliRack. Requires 12VDC. **Redundant** - Secondary power connection for the IntelliRack. Requires 12VDC. (P/N: IRACKUNIVPS)	4.2.4: Connect Power to the IntelliRack
C - Rack mounting holes	Mounting holes to attach the brackets for connection to a rack.	3.3: Rack-Mounting the IntelliRack
D - RJ45 ports for bridging	Connection for “daisy-chaining” multiple IntelliRacks.	4.2.5: Daisy-Chain to Another IntelliRack Unit—Optional
E - UPS status indicators (red)	Indicates the status of the power failures and low battery conditions of the UPS.	1.4: Indicators
F - RS232 indicators	Not presently used.	N/A (future enhancement)
G - Power status indicators (green)	Indicates power status of each power supply.	1.4: Indicators
H - Intellislots	Connection ports for MultiPort 4 cards.	4.2.2: Install MultiPort 4 Cards

1.4 Indicators

The IntelliRack has indicators that show the status of the UPS and input power to the unit, as shown in **Figure 5** and described in **Table 2**.

Figure 5 Indicators on front of unit

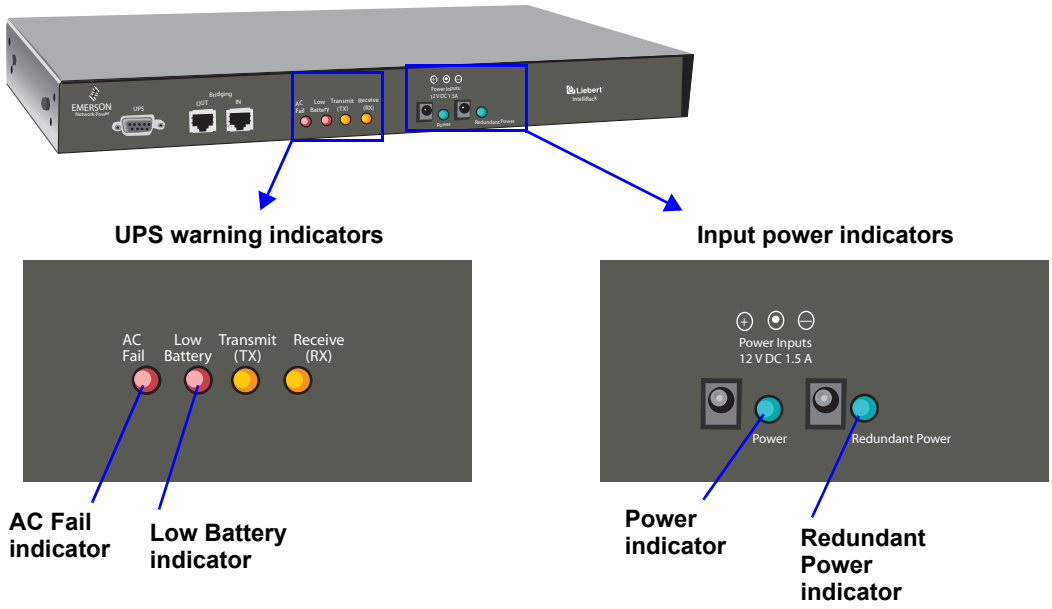


Table 2 Indicators summary

Indicator Type	Indicator	Color	Description
UPS warning indicators	AC Fail	Red	Utility power failure; UPS is on battery, supplying backup power to connected load.
	Low Battery	Red	UPS is on battery and power reserves are nearly depleted.
RS232 indicators	Transmit (TX)	Amber	Not used
	Receive (RX)	Amber	Not used
Input power indicators	Power	Green	Power is connected and powering the IntelliRack.
	Redundant Power	Green	Secondary power is connected and powering the IntelliRack.

2.0 WHAT'S INCLUDED

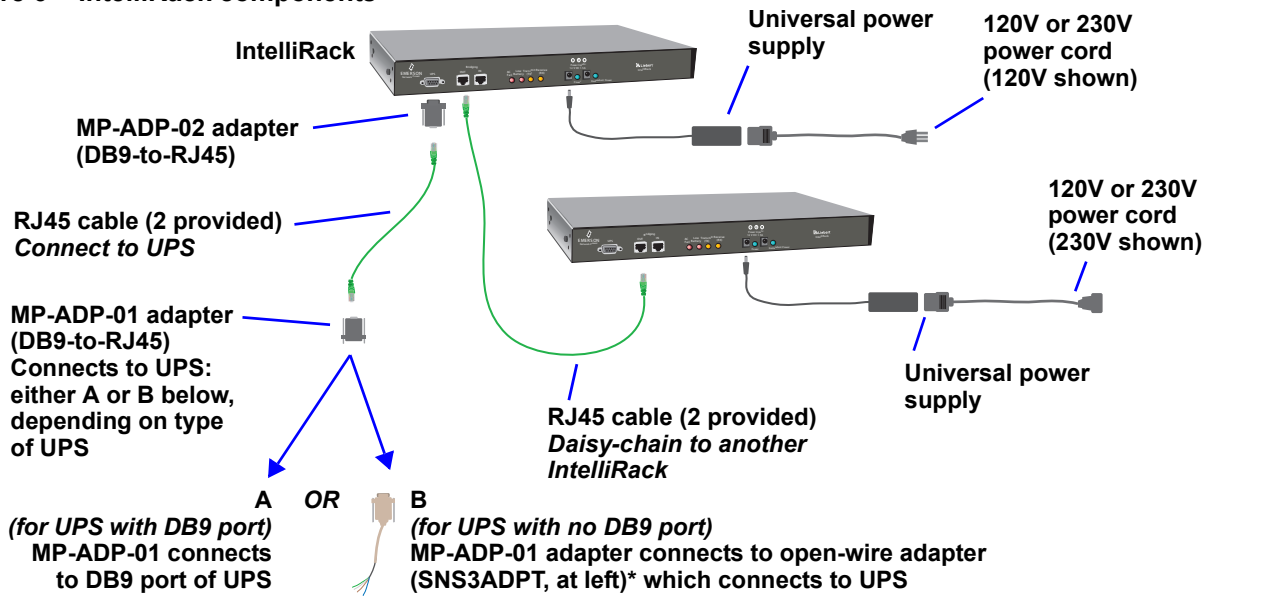
2.1 Components Shipped With IntelliRack

The IntelliRack is shipped with the following components:

Table 3 Components shipped with IntelliRack

Component	Quantity	Function
RJ45 cables, 6 ft. (1.8m) and 25 ft. (7.6m)	2	Connect to the UPS, daisy-chain to another IntelliRack
DB9-to-RJ45 adapters		Attach to each end of an RJ45 cable to connect to a UPS
Adapter MP-ADP-01	1	Connect to a UPS (DB9 port or open-wire adapter)
Adapter MP-ADP-02	1	Connect to the IntelliRack (UPS port)
Universal power supply, 12V, 1.5A	1	Connect to Power connector on the IntelliRack
Line cord for 120V, 6 ft. (1.8m)	1	For 120V: NEMA 5-15P plug
Line cord for 230V, 6 ft. (1.8m)	1	For 230V: IEC320 plug
User manual	1	—
Brackets	2	Attach to the IntelliRack for rack mounting
Screws, M4x8mm	4	To connect rack mounting brackets to the IntelliRack
Rubber feet, self-adhesive, 0.81x0.30mm	4	—
Reclosable Dual Lock™ fasteners	2	To mount power supply on a flat surface

Figure 6 IntelliRack components



2.2 Other Required Components

Other components required for the IntelliRack to function properly include MultiPort 4 kits and cables to connect MultiPort 4 cards to systems that will receive notifications:

- Up to five MultiPort 4 kits, each consisting of:
  - One MultiPort 4 card
  - One molded cable assembly with four connectors
  - User manual
- Cables to connect MultiPort 4's molded cable assembly to systems that will receive signals from the IntelliRack—these cables vary by type of system:
  - MultiLink computers: MultiLink contact closure cable (P/N ML9P9S)
  - AS400 computers: AS400 cable kit (P/N SNAS4915)
  - Other systems: Contact your local Liebert representative or call 1-800-222-5877.

3.0 INSTALLATION

3.1 Installation Considerations

The IntelliRack must be installed indoors where electrical service is available. The IntelliRack should be placed where it can be easily accessed for wiring and installation of MultiPort 4 cards in the back of the unit.

The unit may be either mounted in a rack or placed on a surface, depending on the user's application and the location of equipment to be connected and monitored.

3.1.1 Unpacking and Preliminary Inspection

- Before unpacking the IntelliRack, inspect the shipping carton for damage or signs of mishandling, such as gashes or holes in the carton or severely flattened corners.
- Open the shipping carton carefully. Use care to avoid puncturing the container with sharp objects that might damage the contents.
- Inspect the IntelliRack and all included components for damage. See **2.0 - What's Included** for a list of items that should be in the carton.
- If any damage from shipping or mishandling is observed, immediately file a damage claim with the shipping agency and forward a copy to:

  Liebert Corporation
  Attn: Traffic Department
  1050 Dearborn Drive
  P.O. Box 29186
  Columbus, OH 43229

3.2 Surface Placement

To place the IntelliRack on a surface such as a desktop:

1. Carefully turn the unit upside down.
2. Locate the four self-adhesive rubber feet shipped with the IntelliRack.
3. Attach one rubber foot to each corner on the bottom of the unit.

3.3 Rack-Mounting the IntelliRack

The IntelliRack may be mounted in a 19" or 23" rack, such as the Liebert Foundation.

After determining where to place the unit, check to ensure that you have all the hardware required to install the unit in a rack. Obtain the needed tools and material.

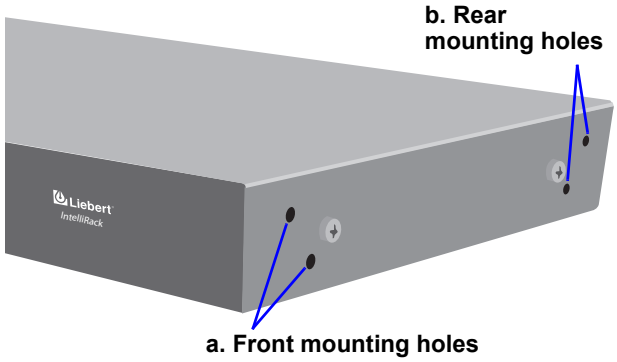
3.3.1 Materials and Tools

You will need these items for rack mounting:

- Brackets for rack mounting - 2
- Screws, M4x8mm, to attach brackets - 4
- Phillips screwdriver

3.3.2 Attaching the Brackets

The IntelliRack has holes on each side to accommodate various ways of attaching the brackets. The unit may be front- or rear-mounted, and it can fit into a 19" or 23" rack.



1. Decide how the unit will be mounted.
   a. **For front mounting:** Use the holes closest to the front of the unit to attach the bracket—see **a** in the figure at right.
   b. **For rear mounting:** Use the holes closest to the rear of the unit to attach the bracket—see **b** in the figure at right.
2. Follow these steps to attach the brackets to a 19" or 23" rack:

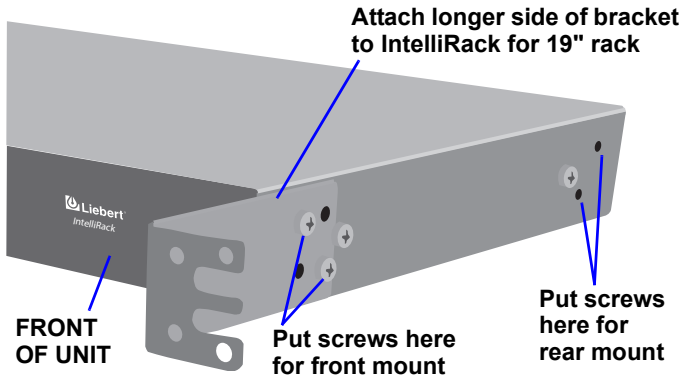
For a 19" rack:

a. Attach the **longer** side of the bracket using two screws as shown at right for front mounting.

   For rear mounting, use holes at rear of unit.

b. Repeat these steps to attach the second bracket on the other side.

c. Slide the unit into the rack and secure the brackets to the frame (mounting hardware not included).



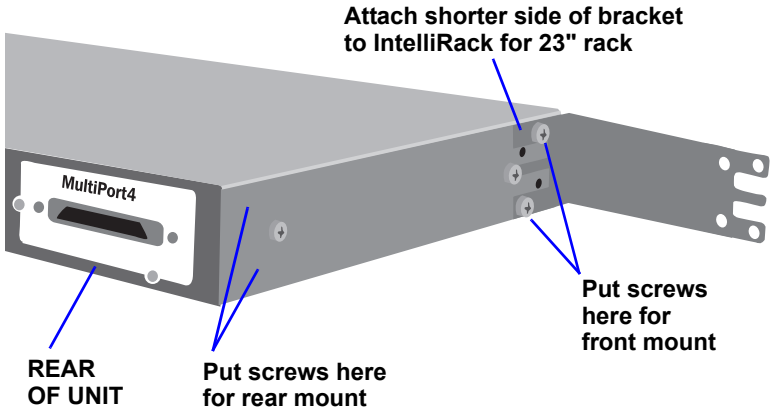
For a 23" rack:

a. Attach the **shorter** side of the bracket using two screws as shown at right for front mounting.

   For rear mounting, use holes at rear of unit.

b. Repeat these steps to attach the second bracket on the other side.

c. Slide the unit into the rack and secure the brackets to the frame (mounting hardware not included).



4.0 WIRING AND CONNECTIONS

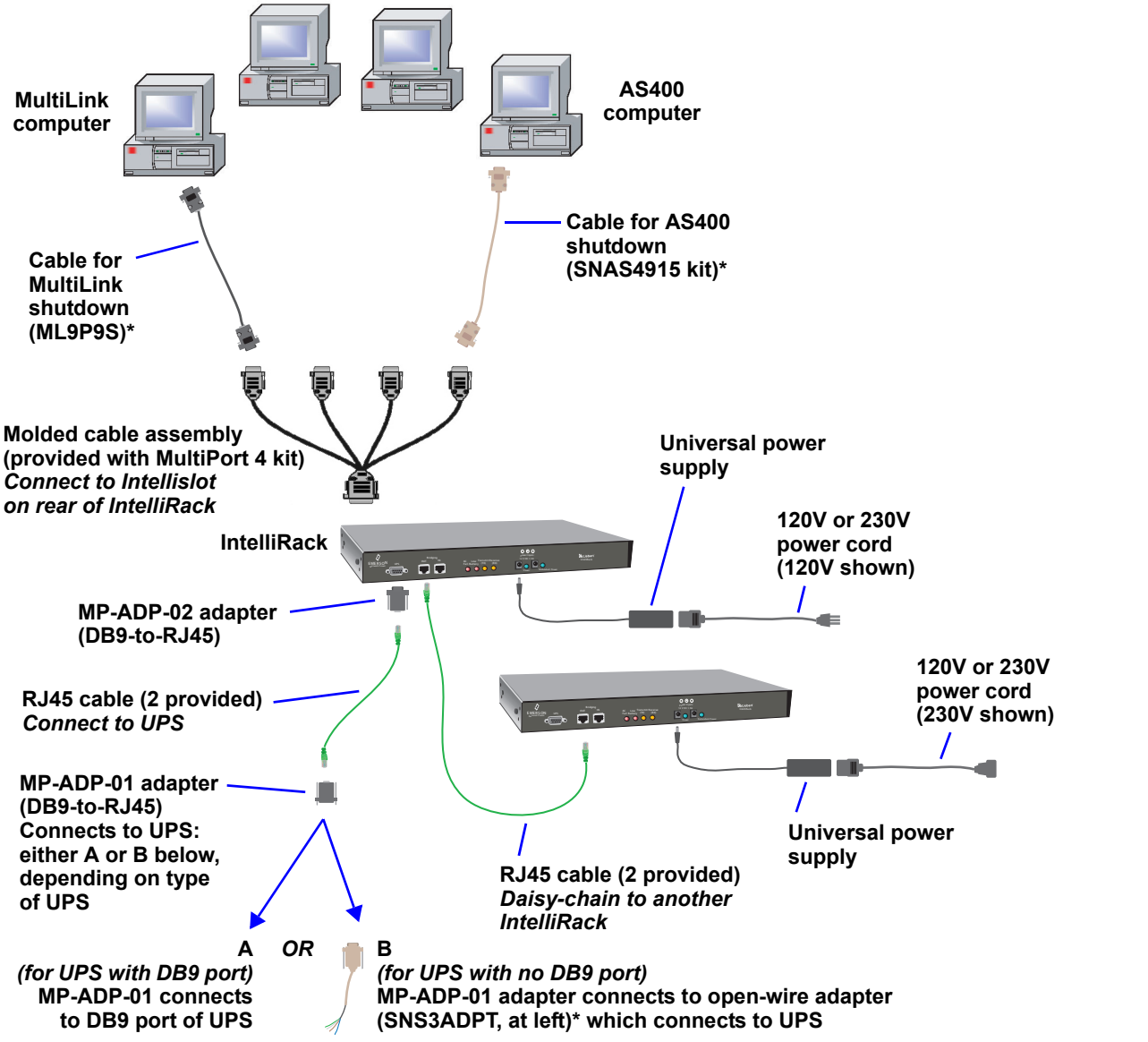
4.1 Wiring Specifications

Connections to the IntelliRack may be made in any order.

Table 4 Wiring specifications

Connection	Provided / Purchased Separately	Maximum Length	For Longer Cables:
RJ45 cable to connect UPS to MultiPort	6 & 25 ft. (1.8 & 7.6m); 2 cables provided	300 ft. (91m)	See **4.2.1 - Make a Custom RJ45 Cable—Optional**.
RJ45 cable to connect Bridging Port			
MultiLink / AS400 cable	10 ft. (3m); Purchased separately	100 ft. (31m)	See the **Appendix**.

Figure 7 Example of IntelliRack unit connections with bridging



* Item purchased separately

4.2 Communications and Power Connections

Connections to the IntelliRack may be made in any order, but Liebert recommends installing MultiPort 4 cards into the Intellislots first, then connecting the IntelliRack to the UPS and finally connecting to a power source.

You will need the following items for communications and power connections:

- MultiPort 4 kit—MultiPort 4 card and molded cable assembly (1-5 kits, depending on system needs)
- DB9-to-RJ45 adapters - 2
- RJ45 cables - 2; 6 ft. (1.8m) and 25 ft. (7.6m)
- Universal power supply, 12V, 1.5A
- Line cord for either 120V or 230V

4.2.1 Make a Custom RJ45 Cable—Optional

Two RJ45 cables are provided to connect the IntelliRack to a UPS (see **4.2.3 - Connect the UPS—DB9 Port**) or to another IntelliRack unit (see **4.2.5 - Daisy-Chain to Another IntelliRack Unit—Optional**).

If a longer cable is required to reach either unit:

- Use a straight-through RJ45 cable.
- The RJ45 cable must be an 8-conductor wire.
- The cable may be up to 300 ft. (91m) long.
- The pin-out to make the connections for this cable is shown in **Table 5**.

Table 5 Pin-out for RJ45 cable

RJ45 male		RJ45 male
1	———————	1
2	———————	2
3	———————	3
4	———————	4
5	———————	5
6	———————	6
7	———————	7
8	———————	8

4.2.2 Install MultiPort 4 Cards

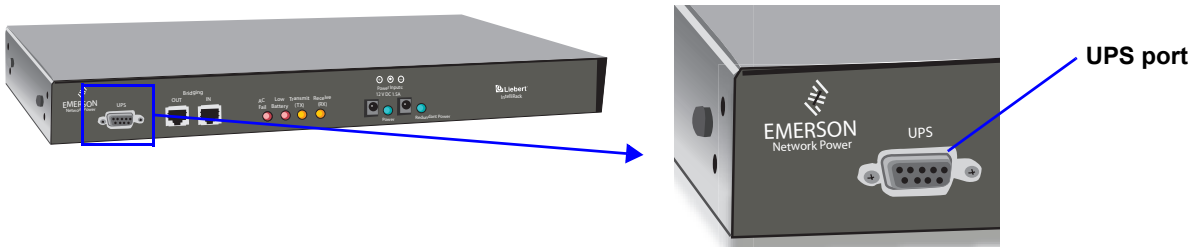
These steps describe how to install a MultiPort 4 card in slots in the back of the IntelliRack. For more information, refer to the MultiPort 4 user manual.

1. Locate Slot 1 on the rear of the IntelliRack. The number appears in white to the left of each slot.

2. Remove the two retaining screws from the cover plate covering Slot 1 on the rear of the IntelliRack. Keep the screws for reassembly in **Step 4**.
3. Orient the card so that the two screw holes align with the screw holes in the IntelliRack. (The card will fit in only one position.) Press the card firmly into the slot until you feel it click into place to ensure it seats properly.
4. Secure the MultiPort 4 card to the IntelliRack with the retaining screws removed in **Step 2**. Make sure the screws are snug, not tight, to prevent damaging the components.
5. Repeat **Steps 2** through **4** for each additional MultiPort 4 card to be used in Slots 2, 3, 4 and 5.
6. Connect the DB25P connector on the molded cable assembly to the MultiPort 4 card's DB25S connector and tighten the retaining screws.
7. Connect each MultiLink computer to one of the output ports on the molded cable assembly, as shown in **Figure 3**. (Each MultiLink computer must have a contact closure cable that can be purchased from Liebert or made by following the instructions in the MultiLink user manual.)
8. Refer to your MultiLink user manual for software installation and configuration procedures.

4.2.3 Connect the UPS—DB9 Port

The DB9 connector provides contact closure communication between the UPS and the computers connected to the MultiPort 4 cards in the IntelliRack.



To connect the UPS to the IntelliRack:

1. Find the two DB9-to-RJ45 adapters.
2. Attach the DB9 end of the **MP-ADP-02** adapter to the UPS port on the front of the IntelliRack.
   NOTE: For the IntelliRack to function properly, you MUST use this adapter (MP-ADP-02) to connect to the IntelliRack.
3. Attach the DB9 end of the **MP-ADP-01** adapter to the DB9 port on the UPS, if the UPS has a DB9 port. If the UPS has no DB9 port, attach the **MP-ADP-01** adapter to the open-wire adapter that will connect to the UPS.
   NOTE: For the IntelliRack to function properly, you MUST use this adapter (MP-ADP-01) to connect to the UPS.
4. Get one of the RJ45 cables and plug it into the adapters on the UPS and the IntelliRack.

NOTE
Two RJ45 cables are provided—6 ft. (1.8m) and 25 ft. (7.6m). If a longer cable is required to reach the UPS, use a straight-through RJ45 cable, which may be up to 300 ft. (91m) long.

*To make your own cable, see **4.2.1 - Make a Custom RJ45 Cable—Optional**.*

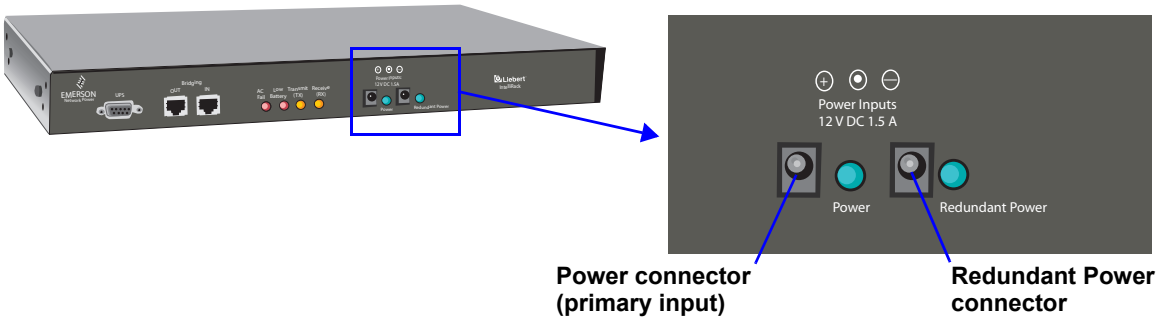
4.2.4 Connect Power to the IntelliRack

The IntelliRack requires 12VDC for proper operation. A universal power supply (12V, 1.5A) is provided with the IntelliRack, along with line cords for 120V or 230V operation.

Connect to the Primary Power Source

1. Connect one end of the universal power supply to the Power connector on the front of the IntelliRack, as shown in **Figure 8**.

Figure 8 Power connectors on front of unit



2. Get the appropriate line cord for either 120V or 230V.
3. When ready, connect one end of the line cord to the power supply and the other end to a reliable power source.

CAUTION
The IntelliRack now has current applied and all circuits are live.

4. To anchor the power supply module securely to a horizontal or vertical surface, use the provided Reclosable Dual Lock fasteners.

Connect to a Redundant Power Source—Optional

The IntelliRack also has a Redundant Power input to connect to a separate input power source to protect against primary source failure. For example, the primary input might be connected to a UPS and the redundant power input might be connected to utility power.

To connect to a redundant power source:

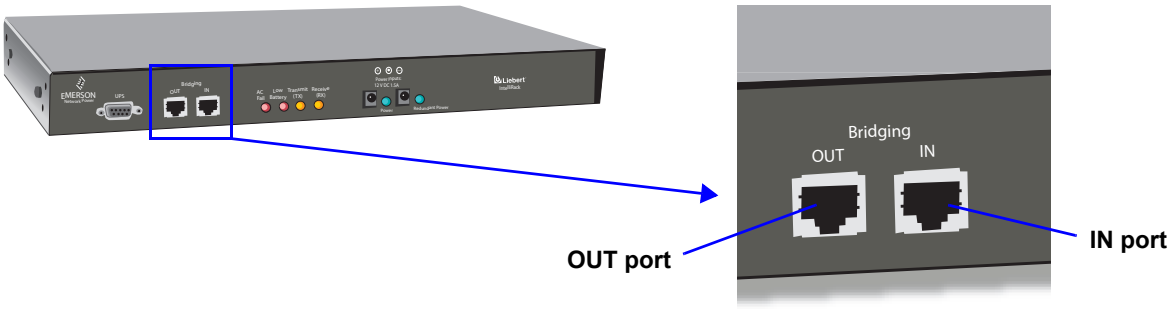
1. Use a 12V, 1.5A power supply and appropriate cables (available from Liebert—see **Table 1**).
2. Connect one end of the universal power supply to the Redundant Power connector on the front of the IntelliRack, as shown in **Figure 8**.
3. Get the appropriate line cord for either 120V or 230V.
4. Connect one end of the line cord to the power supply and the other end to a reliable power source.

4.2.5 Daisy-Chain to Another IntelliRack Unit—Optional

A built-in bridging feature allows IntelliRack units to be daisy-chained together (see **Figure 7**). This connection increases the number of computers that can receive low battery and power failure notifications.

To connect the IntelliRack to a second IntelliRack unit:

1. Find one of the RJ45 cables shipped with the IntelliRack.



2. Connect one end of the RJ45 cable to the OUT port of the first IntelliRack unit.
3. Connect the other end of the cable to the IN port of the second IntelliRack unit.

NOTE

Two RJ45 cables are provided—6 ft. (1.8m) and 25 ft. (7.6m). If a longer cable is required to reach the second IntelliRack unit, use a straight-through RJ45 cable, which may be up to 300 ft. (91m) long.

*To make your own cable, see **4.2.1 - Make a Custom RJ45 Cable—Optional**.*

5.0 SPECIFICATIONS

Table 6 IntelliRack specifications

Power Requirements (2 inputs)	12VDC ±10% of nominal; 50/60 Hz 1.5A, 18VA
Dimensions W x D x H, in. (mm)	16 x 9 x 1.66 (406.4 x 228.6 x 42.2)
Weight	9.9 lbs. (4.5 kg)
Mounting	19" rack mount, 23" rack mount or desktop
Ambient Operating Environment	32ºF to 104ºF (0ºC to 40ºC) 0% RH to 95% RH (non-condensing)
Agency Listings	
UL	None
CSA	None
CE	None
FCC Compliance	None
Communication Ports (Quantity)	
DB9 (1)	To UPS; uses adapters included with IntelliRack
RJ45 (2)	Bridges multiple IntelliRacks together; uses RJ45 cables included with IntelliRack
Intellislots (5)	Hot-swappable ports

NOTE

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

APPENDIX

LIEBERT MULTILINK™ CABLE ADAPTER KIT (IRACKMLADPT)

Installation Instructions

Description

The Liebert MultiLink Cable Adapter Kit has two adapters designed for cable connections from a MultiLink computer to a UPS or to a multiplexer such as the IntelliRack. These DB9-to-RJ45 adapters are used at either end of an RJ45 straight-through cable, as described in these instructions.

This kit has the following components:

- DB9M - RJ45F adapter, part number ML-ADP-03
- DB9F - RJ45F adapter, part number ML-ADP-04

These instructions describe how to connect the adapters and an RJ45 cable. **Step 3** also provides information to make a longer RJ45 cable, if needed.

NOTE

Liebert recommends—although it is not required—powering down your system and UPS before continuing with the following cable installation.

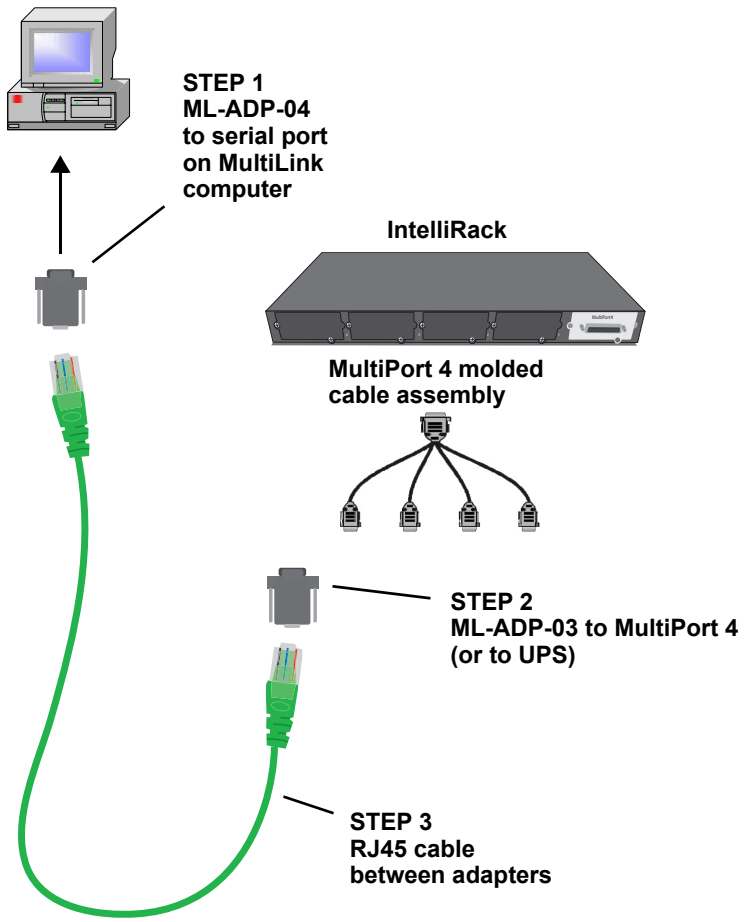
Connecting Adapters

1. Connect the adapter labeled **ML-ADP-04** to the serial communication port on the MultiLink computer.
2. Connect the other adapter (**ML-ADP-03**) as follows, depending on your system configuration:

   To a multiplexer such as the IntelliRack:
   Connect the **ML-ADP-03** adapter to a connector on the MultiPort 4 molded cable assembly.

   To a UPS with a DB9 port:
   Connect the **ML-ADP-03** adapter to the DB9 communication interface on the UPS.
3. Connect an RJ45 straight-through cable between the two adapters. The cable must be an 8-conductor wire. The pinout for this cable is:

RJ45 male		RJ45 male
1	———	1
2	———	2
3	———	3
4	———	4
5	———	5
6	———	6
7	———	7
8	———	8



Liebert IntelliRack to UPS Cable Kit (IRACKPADPT)

Installation Instructions

Description

The Liebert IntelliRack to UPS Cable Kit has two adapters designed for cable connections from a communication interface on the UPS to the IntelliRack. These DB9-to-RJ45 adapters are used at either end of an RJ45 straight-through cable, as described in these instructions.

This kit has the following components:

- DB9M - RJ45F adapter, part number MP-ADP-01
- DB9M - RJ45F adapter, part number MP-ADP-02

These instructions describe how to connect the adapters and an RJ45 cable. **Step 3** also provides information to make a longer RJ45 cable, if needed.

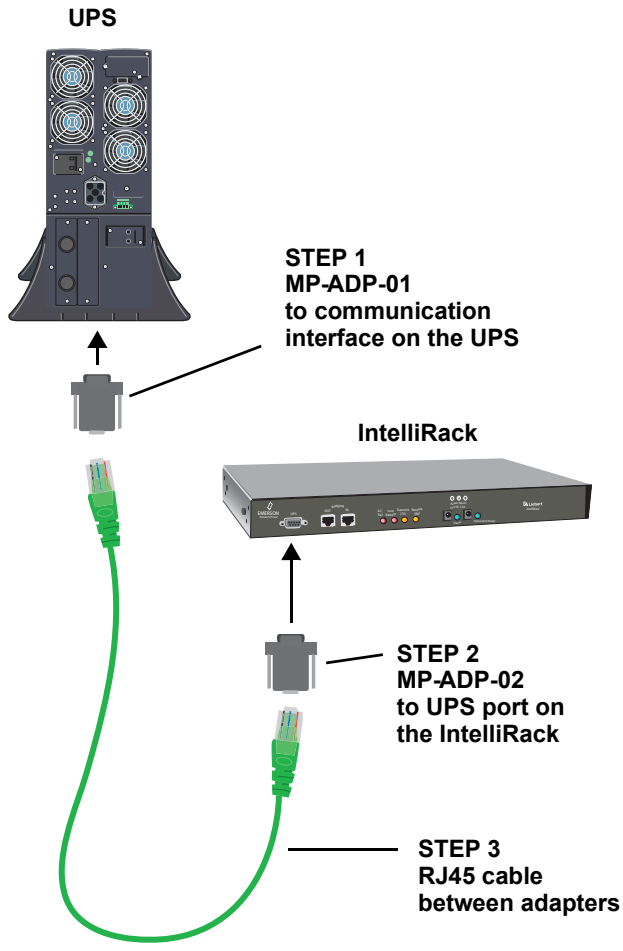
NOTE

Liebert recommends—although it is not required—powering down your system and UPS before continuing with the following cable installation.

Connecting Adapters

1. Connect the adapter labeled **MP-ADP-01** to the communication interface on the UPS.
2. Connect the other adapter (**MP-ADP-02**) to the UPS port on the front of the IntelliRack.
3. Connect an RJ45 straight-through cable between the two adapters. The cable must be an 8-conductor wire. The pinout for this cable is:

RJ45 male		RJ45 male
1	———————	1
2	———————	2
3	———————	3
4	———————	4
5	———————	5
6	———————	6
7	———————	7
8	———————	8



LIEBERT INTELLIRACK SECONDARY CABLE EXTENSION KIT (IRACKSADPT)

Installation Instructions

Description

The Liebert IntelliRack Secondary Cable Extension Kit has two adapters designed for cable connections from a computer to a UPS or to a multiplexer such as the IntelliRack. These DB9-to-RJ45 adapters are used at either end of an RJ45 straight-through cable, as described in these instructions.

This kit has the following components:

- DB9M - RJ45F adapter, part number MP-ADP-05
- DB9F - RJ45F adapter, part number MP-ADP-06

These instructions describe how to connect the adapters and an RJ45 cable. **Step 3** also provides information to make a longer RJ45 cable, if needed.

NOTE

Liebert recommends—although it is not required—powering down your system and UPS before continuing with the following cable installation.

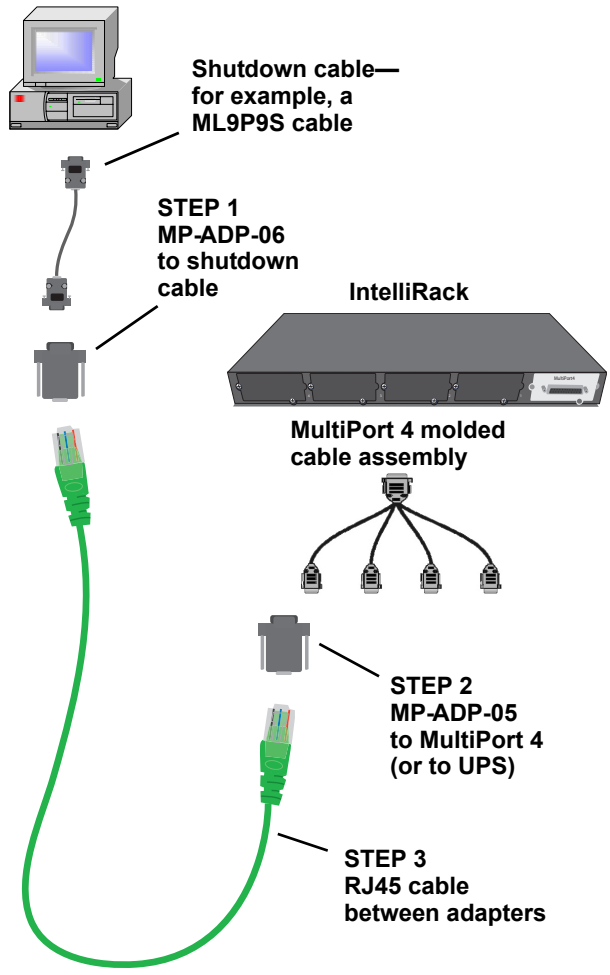
Connecting Adapters

1. Connect the adapter labeled **MP-ADP-06** to the communication cable—for example, a ML9P9S cable—that is connected to the serial port on the computer system.
2. Connect the other adapter (**MP-ADP-05**) as follows, depending on your system configuration:

   To a multiplexer such as the IntelliRack:
   Connect the **MP-ADP-05** adapter to a connector on the MultiPort 4 molded cable assembly.

   To a UPS with a DB9 port:
   Connect the **MP-ADP-05** adapter to the DB9 communication interface on the UPS.
3. Connect an RJ45 straight-through cable between the two adapters. The cable must be an 8-conductor wire. The pinout for this cable is:

RJ45 male		RJ45 male
1	———————	1
2	———————	2
3	———————	3
4	———————	4
5	———————	5
6	———————	6
7	———————	7
8	———————	8



Liebert®
Keeping Business in Business®

MONITORING

INTELLIRACK

USER MANUAL

The Company Behind the Products

With over a million installations around the globe, Liebert is the world leader in computer protection systems. Since its founding in 1965, Liebert has developed a complete range of support and protection systems for sensitive electronics:

- Environmental systems—close-control air conditioning from 1 to 60 tons
- Power conditioning and UPS with power ranges from 300 VA to more than 1000 kVA
- Integrated systems that provide both environmental and power protection in a single, flexible package
- Monitoring and control—from systems of any size or location, on-site or remote
- Service and support through more than 100 service centers around the world and a 24/7 Customer Response Center

While every precaution has been taken to ensure the accuracy and completeness of this literature, Liebert Corporation assumes no responsibility and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

SL-31090 (12/03) Rev. 0

Technical Support/Service

Web Site
www.liebert.com

Monitoring
800-222-5877
monitoring@liebert.com
Outside the US: 614-841-6755

Single-Phase UPS
800-222-5877
upstech@liebert.com
Outside the US: 614-841-6755

Three-Phase UPS
800-543-2378
powertech@liebert.com

Environmental Systems
800-543-2778

Outside the United States
614-888-0246

Locations

United States
1050 Dearborn Drive
P.O. Box 29186
Columbus, OH 43229

Italy
Via Leonardo Da Vinci 8
Zona Industriale Tognana
35028 Piove Di Sacco (PD)
+39 049 9719 111
Fax: +39 049 5841 257

Asia
23F, Allied Kajima Bldg.
138 Gloucester Road
Wanchai
Hong Kong
+852 2 572 2201
Fax: +852 2 831 0114

EMERSON™
Network Power