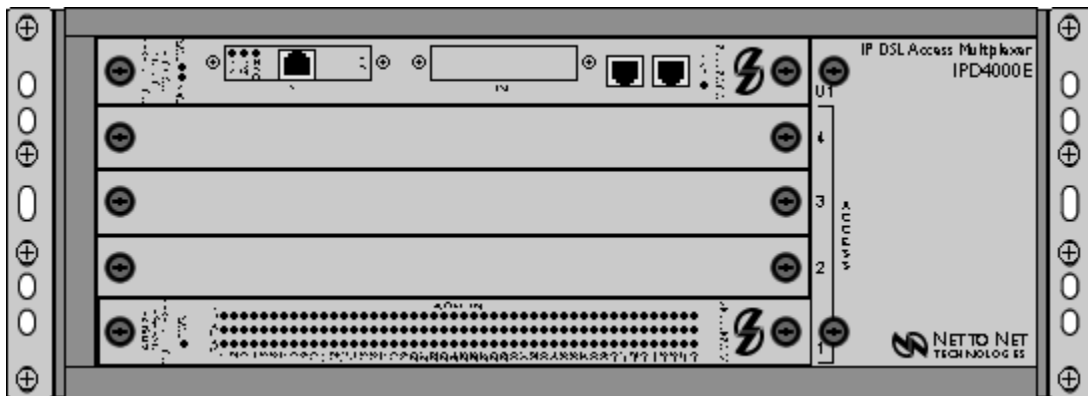


IPD4000E

4-Module IP DSLAM: Internet Protocol Digital Subscriber Line Access Multiplexer



© Copyright 2004 Net to Net Technologies, Inc.
™ The Net to Net Logo is a trademark of Net to Net Technologies, Inc.

Worldwide Headquarters
Net to Net Technologies
112 Corporate Drive
Portsmouth, NH 03801 USA
1 (877) 638-2638
support@nettonet.com

<http://www.NetToNet.com>

EMEA Headquarters
Net to Net Technologies
Victoria House, 19 Park Way
Newbury Berkshire RG14 1EE UK
44 (0) 1635-570950
support-emea@nettonet.com

Contents

1.0 INSTALLATION

1.1 Unpack and Inspect the Equipment

1.2 Select a Site for Installation

- 1.2.1 Tabletop
- 1.2.2 Rack

1.3 Install Your Management Module

- 1.3.1 Install an Uplink Module on the Management Module
- 1.3.2 Identify the Appropriate Slot for Installation
- 1.3.3 Align the Management Module with the Slot Module Guides
- 1.3.4 Slide the Management Module Firmly into the Chassis

1.4 Install Your Interface Module(s)

- 1.4.1 Select a Slot for Installation
- 1.4.2 Align the Interface Module with the Slot Module Guides
- 1.4.3 Slide the Interface Module Firmly into the Chassis

1.5 Power Up Your IPD4000E

- 1.5.1 Establish a Ground Connection
 - 1.5.1.1 Connect a Ground Wire to the IPD4000E
 - 1.5.1.2 Connect the Ground Wire to a Frame Ground
- 1.5.2 Select a Terminal Block
- 1.5.3 Establish a Power Connection
 - 1.5.3.1 Connect Your Positive Power Lead to the Terminal Block
 - 1.5.3.2 Connect Your Negative Power Lead to the Terminal Block
 - 1.5.3.3 Connect Both Power Leads to a Fuse Panel
- 1.5.4 Verify the Connection

1.6 Establish Your Uplink Connections

1.7 Connect Your Subscriber Lines

- 1.7.1 Identify the Appropriate RJ21 Connector(s)
- 1.7.2 Detach the Velcro Strap
- 1.7.3 Position the RJ21 Connector
- 1.7.4 Secure the RJ21 Connector
- 1.7.5 Verify The Connection(s)

1.8 Secure the Connecting Cables

2.0 CONFIGURATION AND MANAGEMENT

3.0 ADDITIONAL INFORMATION

3.1 Fan Module

3.2 IPD4000E Interface Capacity

3.3 Technical Support

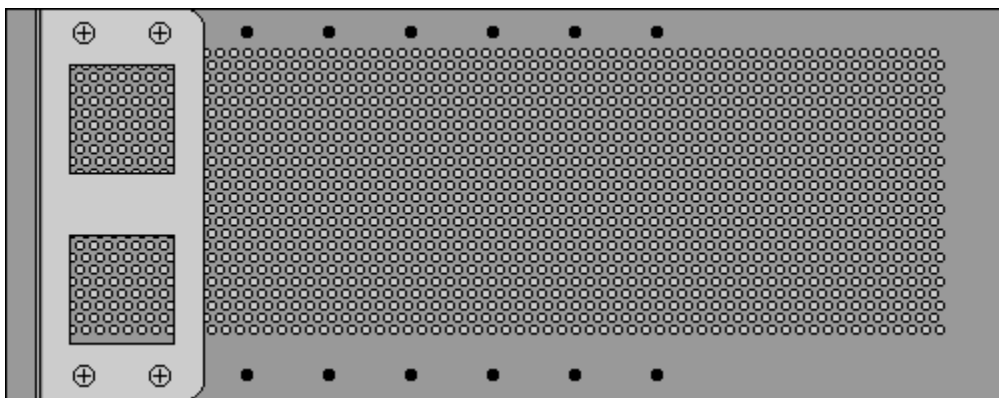
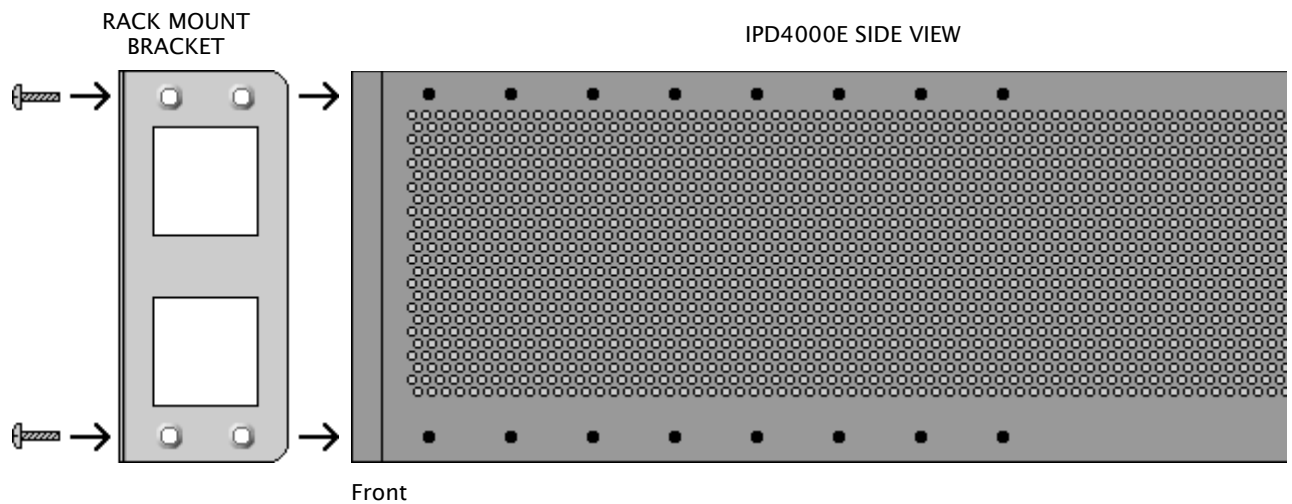
- 3.3.1 Net to Net Technologies' Web Site
- 3.3.2 Technical Support Engineers

3.4 Regulatory Compliance

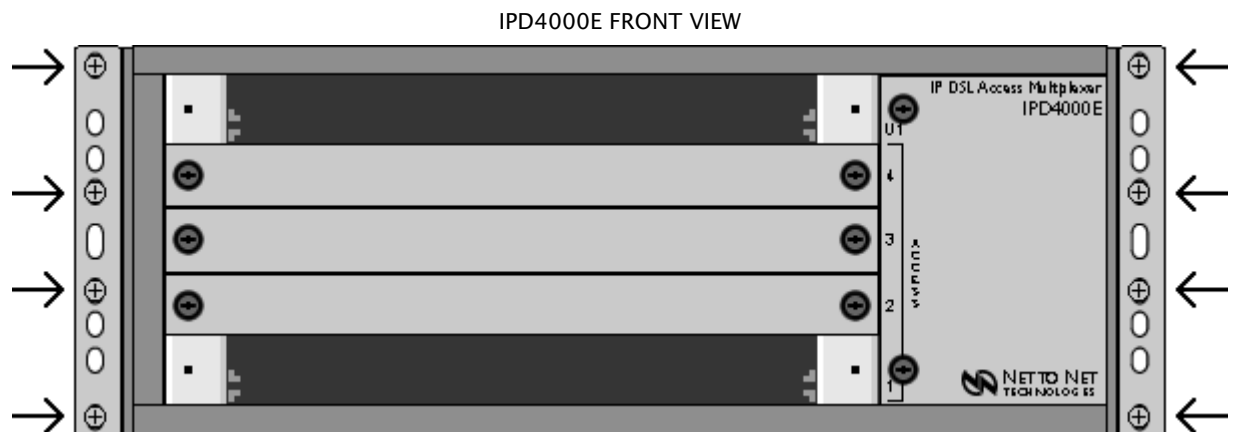
- 3.4.1 Site Selection Criteria
- 3.4.2 Class A Equipment
 - 3.4.2.1 US Federal Communications Commission (FCC)
 - 3.4.2.2 Industry Canada
 - 3.4.2.3 Europe

1.2.2 Rack

Using a Phillips Screwdriver, attach the two [2] provided rack mount brackets to the sides of the IPD4000E with eight [8] of the ten [10] provided bracket screws. There are seven position options for the rack brackets; position them as best suited to the space available for your chassis on the rack being utilized.



Mount the chassis onto the rack and secure the rack mount brackets to the sides of the rack using one of the two provided sets of eight [8] rack screws (whichever size fits the rack being utilized).



Check the rack for stability, ensuring that installation of the IPD4000E has not caused the rack to become top-heavy.

1.3 Install Your Management Module

A management module provides the functional control for Net to Net Technologies' IPD4000E; the IPD4000E cannot function without one. There are several different models available for purchase: refer to <http://www.nettonet.com/products> for further information or contact your Net to Net sales representative to discuss your options.

1.3.1 Install an Uplink Module on the Management Module

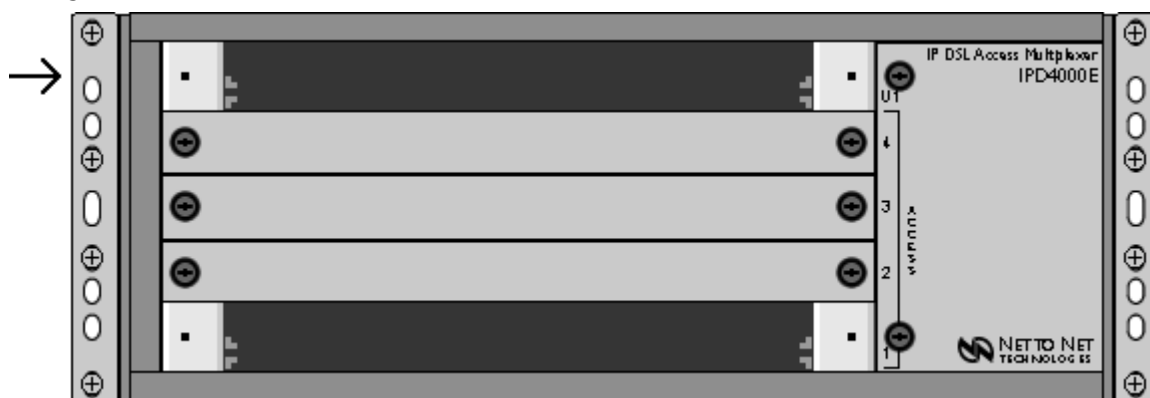
An uplink module provides the upstream network connection for Net to Net Technologies' IPD4000E; a management module cannot function without one. Depending on the management module model that you plan to install in your IPD4000E, you will need either a Media Interface Module (MIM) or an Uplink Interface Module (UIM). Only one uplink module is required for operational purposes, however two uplink modules may be installed, one in each port of the management module, if redundancy is desired. Refer to your management module and/or uplink module installation instructions at <http://www.nettonet.com/support/docs> for further information.

CAUTION If a blank plate is removed from a management module uplink port, it must be replaced with an uplink module. DO NOT OPERATE AN IPD4000E WITH A MANAGEMENT MODULE THAT HAS AN OPEN UPLINK PORT.

1.3.2 Identify the Appropriate Slot for Installation

The IPD4000E is a five slot chassis: slots 1-4 are reserved for interface modules and Slot U1 is reserved for a management module. The IPD4000E is factory shipped with slots 1 and U1 open and ready for module installation.

Management Module Slot



1.3.3 Align the Management Module with the Slot Module Guides

With the management module printed circuit board (PCB) facing UP and the management module model name, and Net to Net logo, on the RIGHT side of the module faceplate (facing towards you), align the left and right edges of the PCB with the U1 slot module guides on the IPD4000E.

CAUTION If a blank plate is removed from slot 2-4, it must be replaced with an interface module. DO NOT OPERATE YOUR IPD4000E WITH AN EMPTY MODULE SLOT.

1.4.2 Align the Interface Module with the Slot Module Guides

With the interface module PCB facing UP and the interface module model name, and Net to Net logo, on the RIGHT side of the module faceplate (facing towards you), align the left and right edges of the PCB with the slot module guides of the chosen slot on the IPD4000E.



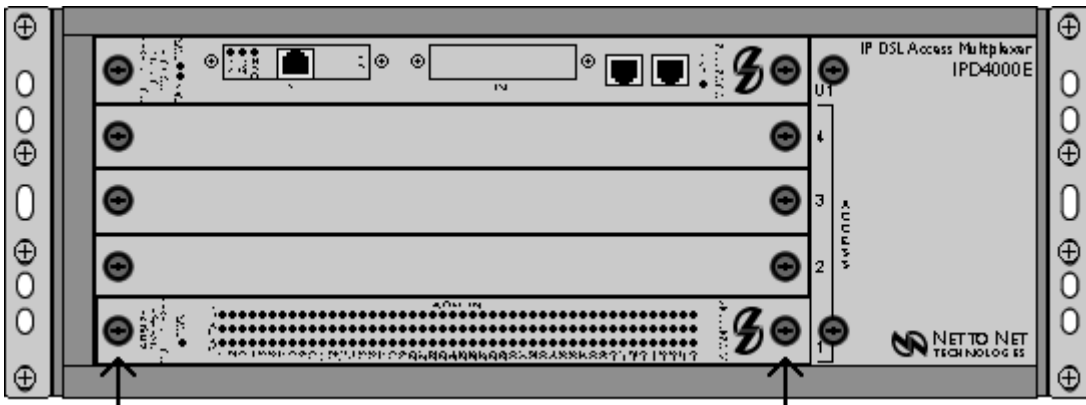
Slot Module Guides



INTERFACE MODULE

1.4.3 Slide the Interface Module Firmly into the Chassis

Tighten the fastening screws on the interface module faceplate by turning them clockwise with a Phillips screwdriver. Be careful NOT TO OVER-TIGHTEN the screws.



Fastening Screws

1.5 Power Up Your IPD4000E

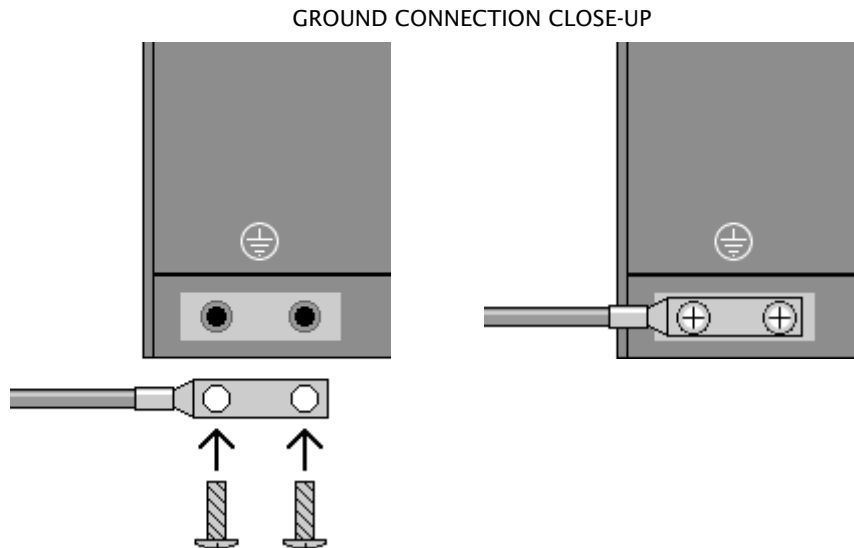
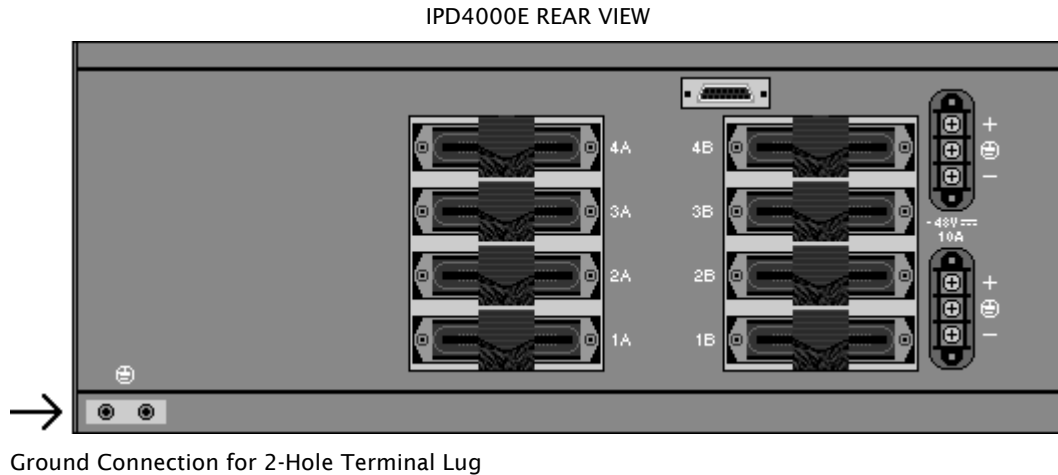
CAUTION Turn your DC power source(s) OFF until you have completed connection of the IPD4000E as outlined below.

1.5.1 Establish a Ground Connection

CAUTION DO NOT operate your IPD4000E without a ground connection.

1.5.1.1 Connect a Ground Wire to the IPD4000E

Line up the 2-hole terminal lug of your ground wire with the two holes on the small, unpainted section on the back of your chassis. Secure the terminal lug to the chassis with two #10-32 screws.

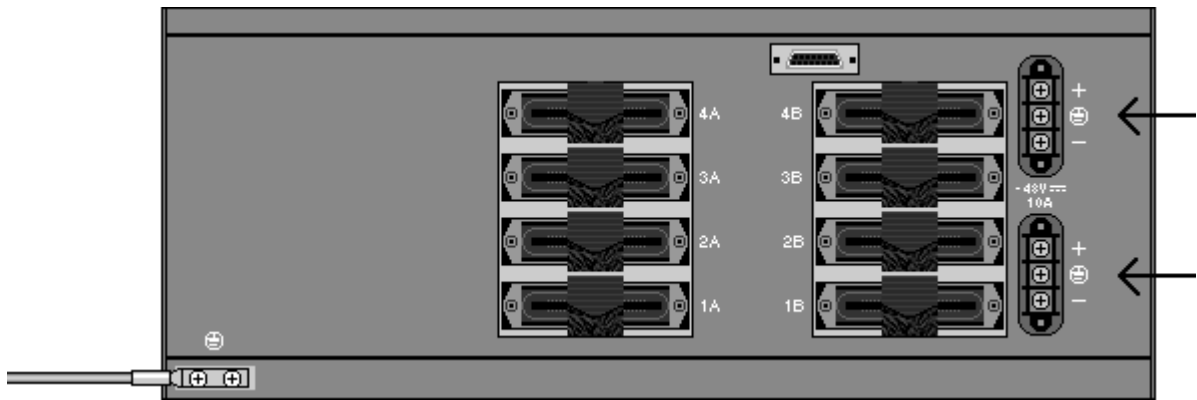


1.5.1.2 Connect the Ground Wire to a Frame Ground

Ground wire connection can vary from location to location, although typically all equipment in a Central Office is grounded to a common copper bus.

1.5.2 Select a Terminal Block

Either terminal block on the back of the IPD4000E may be used to power the chassis; only one terminal block is required for operational purposes. The two terminal blocks on the IPD4000E are independent feeds. Chassis power is supplied by only one terminal block at a time; the second supply is merely back-up. Likewise, the two terminal blocks do not load-share. Each terminal block must be supplied with adequate Amps to run the chassis independently; power is not cumulative between the two.



1.5.3 Establish a Power Connection

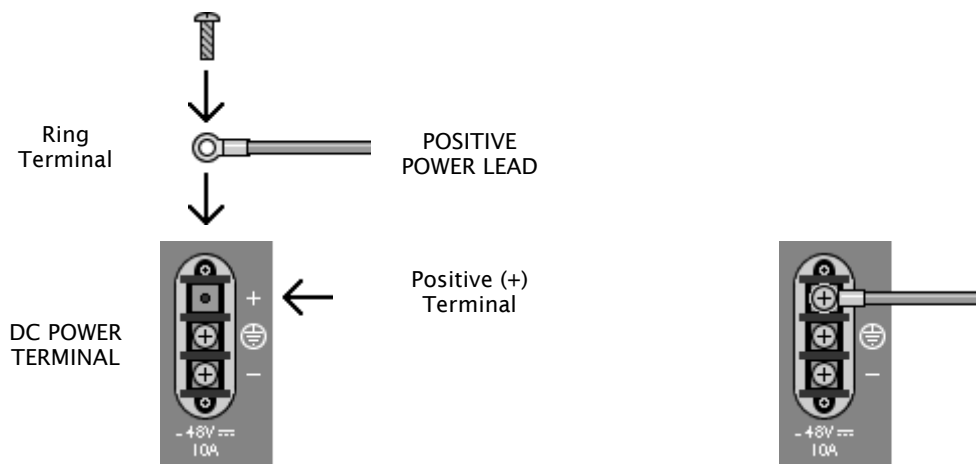
DC POWER SPECIFICATIONS

-48V DC
10 Amps maximum

Although actual power draw depends upon chassis configuration, a fully loaded chassis averages around **6 Amps**.

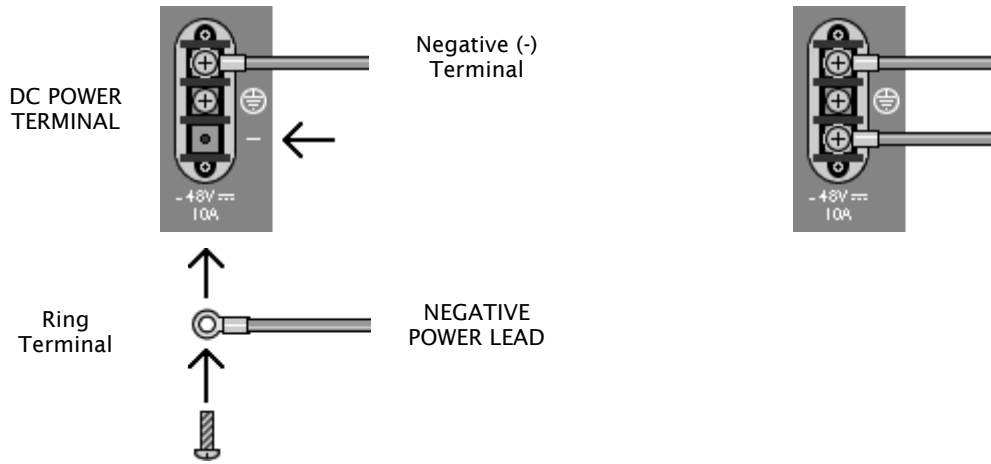
1.5.3.1 Connect Your Positive Power Lead to the Terminal Block

Using a Phillips Screwdriver, remove the upper screw from the chosen terminal block (labeled "+" on the chassis). Slide the ring terminal of your positive power lead around the shaft of the screw and re-insert the screw into the same "+" terminal from which it was removed.



1.5.3.2 Connect Your Negative Power Lead to the Terminal Block

Remove the right-hand screw (labeled "-") from the same terminal block. Slide the ring terminal of your NEGATIVE lead around the shaft of the screw and re-insert the screw into the same "-" terminal from which it was removed.



CAUTION Be sure to attach THE POSITIVE LEAD TO THE POSITIVE TERMINAL and the NEGATIVE LEAD TO THE NEGATIVE TERMINAL as indicated on your IPD4000E terminal block labels.

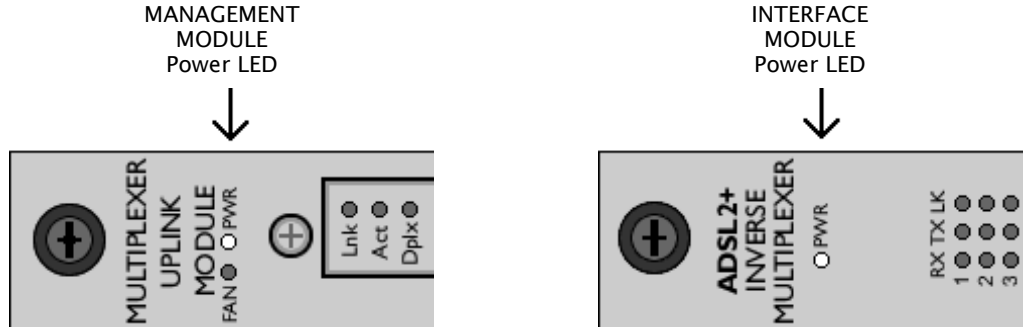
1.5.3.3 Connect Both Power Leads to a Fuse Panel

The negative (-) lead connects to a "Batt" (Battery) terminal and the positive (+) lead connects to a "Return" terminal on your DC power supply.

CAUTION The power source(s) connected to the IPD4000E must be equipped with a disconnect device such as an On/Off switch. Otherwise, an appropriately rated circuit breaker must be installed on each power circuit to be used. In the case of an emergency, hazardous voltages will not be removed from the IPD4000E until all power sources have been either turned off or disconnected from the chassis.

1.5.4 Verify the Connection

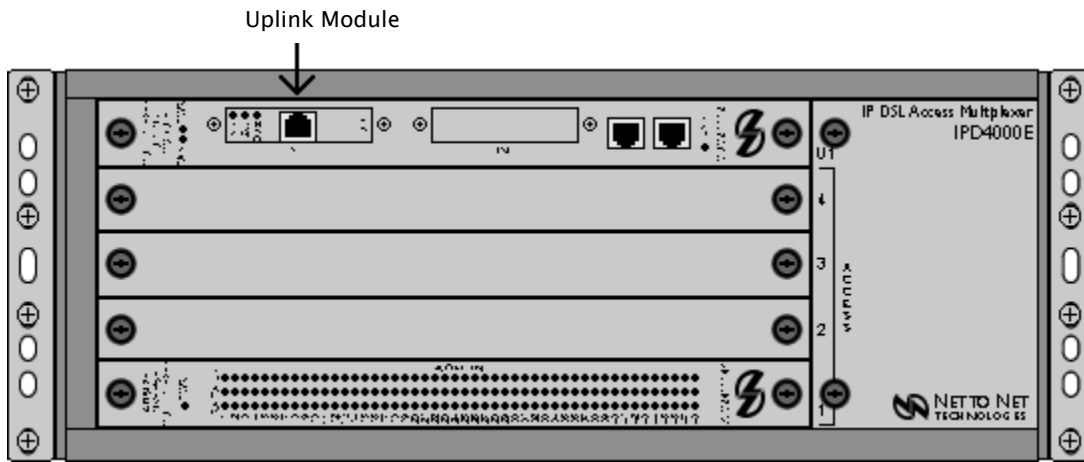
Turn your power source(s) *on*. The PWR (power) LED on both the interface module and management module faceplates will illuminate solid green to indicate the modules are receiving power.



1.6 Establish Your Uplink Connections

NOTE No configuration is necessary for Uplink Interface Modules (UIMs) or Media Interface Modules (MIMs), as installed on the management module(s) in your IPD4000E, to operate at default settings. However, if you wish to run your uplink connections at settings other than the UIM or MIM defaults, Net to Net recommends configuring the UIM or MIM prior to connection.

For further connection and configuration information, refer to the installation instructions of your particular UIM or MIM model at <http://www.nettonet.com/support/docs> .



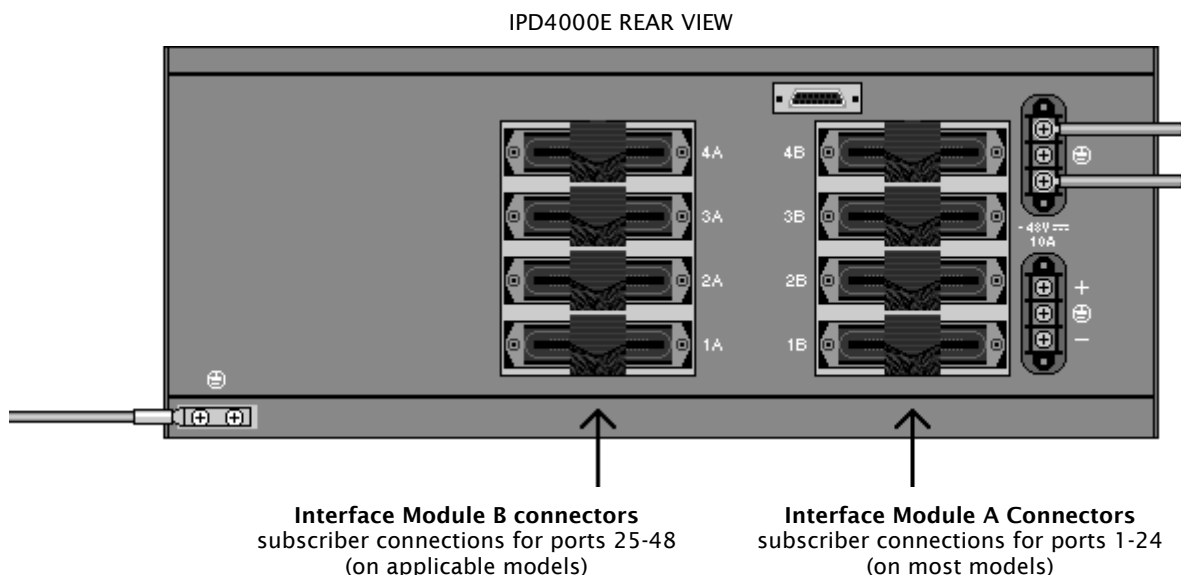
1.7 Connect Your Subscriber Lines

NOTE No configuration is necessary for the interface module(s) installed in your IPD4000E to operate at default settings. However, if you wish to run your subscriber connections at settings other than the factory defaults, Net to Net recommends configuring the interface module(s) prior to connection. Refer to the installation instructions for your particular interface module model(s) at <http://www.nettonet.com/support/docs> for configuration information.

The IPD4000E chassis supports ADSL, IDSL, SDSL and T1/E1 technologies. Ensure that the subscriber lines you are connecting correspond with the technology of the interface module(s) installed in your IPD4000E.

1.7.1 Identify the Appropriate RJ21 Connector(s)

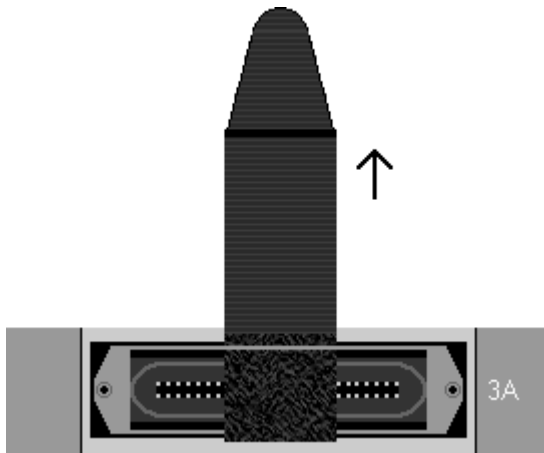
Subscriber lines must be connected according to the IPD4000E slot in which the corresponding interface module was installed. Interface module slots 1-4 run from bottom to top; the corresponding RJ21 ports are directly behind each slot on the back of the chassis (1-4, bottom to top). Each interface module slot on the IPD4000E has two [2] corresponding RJ21 connectors on the back of the chassis: the RJ21 connectors on the left (A) provide the subscriber connections for interface module ports 1-24 (on most models) and the RJ21 connectors on the right (B) provide the subscriber connections for interface module ports 25-48 (on applicable models).



EXCEPTION For the TIM1500-24 and EIM2000-24 interface modules, the A connectors provide the subscriber connections for ports 1-12 and the B connectors provide the subscriber connections for ports 13-24.

1.7.2 Detach the Velcro Strap

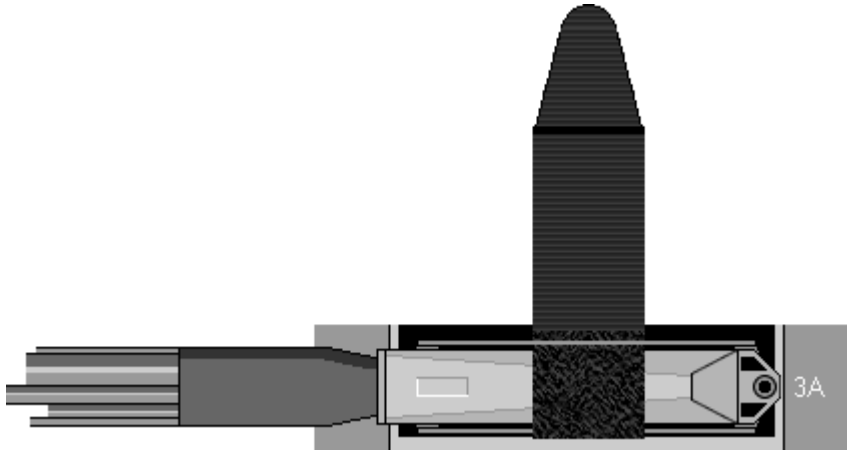
Detach the Velcro Strap from the female RJ21 connector port: lift the Velcro tab from the bottom and pull the strap upward to open, leaving it looped under the right side of the connector frame.



FEMALE RJ21 CONNECTOR A
FOR INTERFACE MODULE SLOT 3

1.7.3 Position the RJ21 Connector

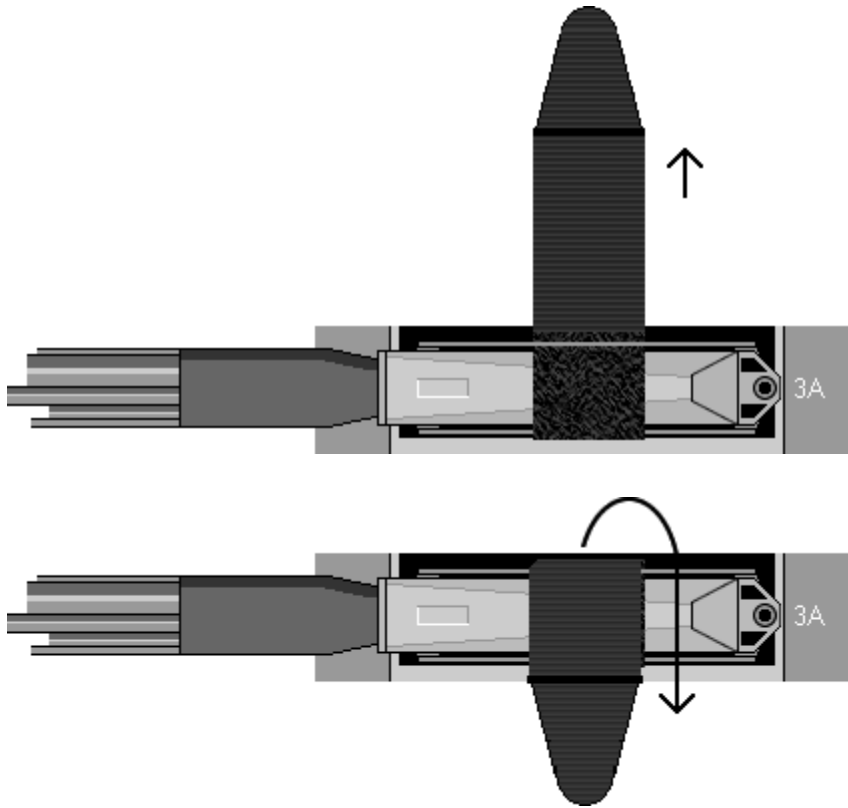
Slide the male RJ21 connector of your interface cable underneath the Velcro, from the left, and press it firmly into the female RJ21 connector port on the chassis.



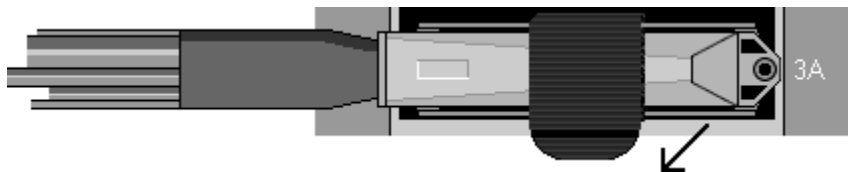
MALE RJ21 CONNECTOR OF
YOUR INTERFACE CABLE

1.7.4 Secure the RJ21 Connector

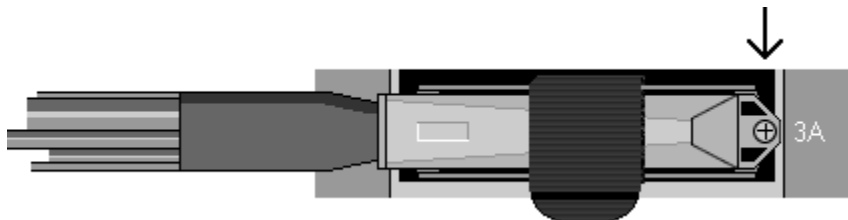
Pull the Velcro strap upward, making sure that it is snug against the connector, then pull the strap back down, such that the Velcro layers stick to one another across the top of the connector.



Tuck the tab at the end of the strap down between the connector frames so that it is out of the way of other connections.



Screw the right side of the RJ21 cable connector into the jack screw on the right side of the RJ21 connector frame on the chassis.



NOTE If you are using a 120 or 180 degree cable, both the right and left sides of the cable connector should be screwed to the RJ21 connector frame on the chassis.

1.7.5 Verify The Connection(s)

The LK (Link) LED for each port being connected with a remote modem will illuminate solid or flashing green to indicate a connection has been established. Link up time between interface modules and remote modems can vary from one to five minutes depending on the quality, gauge and distance of the copper cable pair(s) being used. Refer to individual interface module user guides at

<http://www.nettonet.com/support/docs> for specific information such as connector pinouts, parameter configurations and distance capabilities.



1.8 Secure the Connecting Cables

Position all connecting cables such that they will not become a tripping hazard or pull loose from the chassis; secure with cable ties or velcro straps.

2.0 CONFIGURATION AND MANAGEMENT

Although no configuration is necessary to run subscriber lines at Net to Net Technologies' default settings, all IPD4000E parameter settings are software selectable via Command Line Interface (CLI), Simple Network Management Protocol (SNMP) and/or Net to Net's Network Management System (NMS). IPD4000E management capabilities depend upon the management module model installed in your chassis. Once the management module has been initialized, the interface modules installed in your IPD4000E may also be configured as desired.

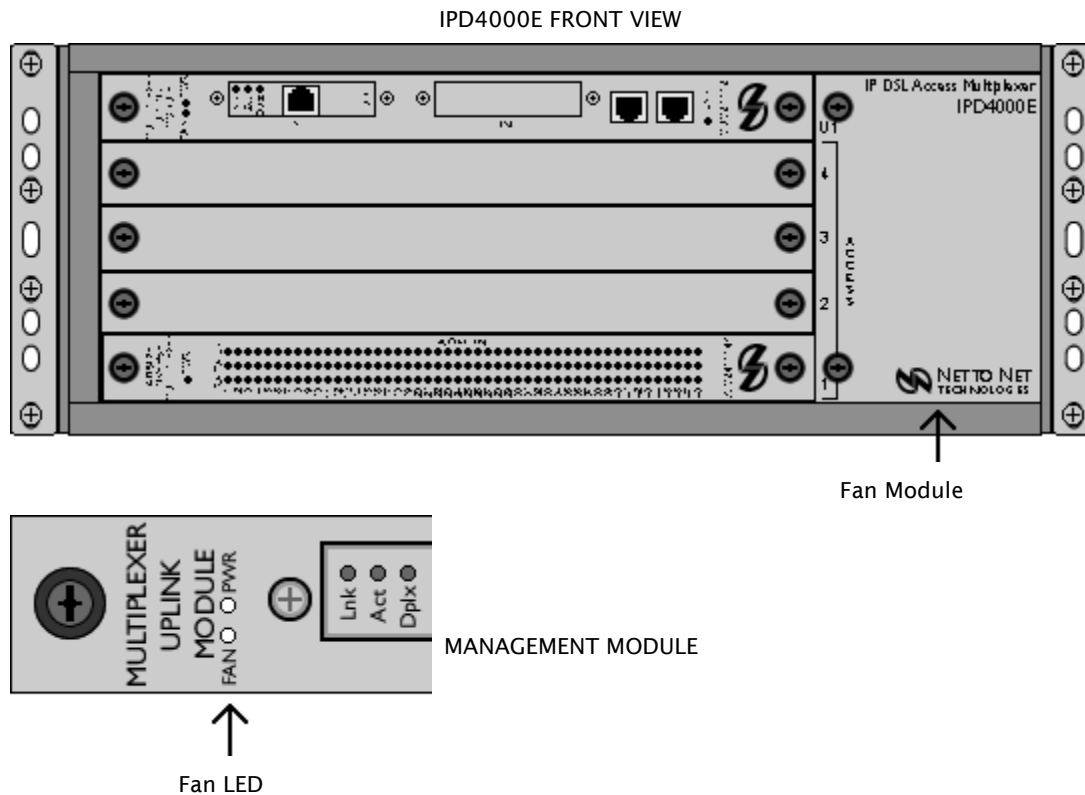
Refer to the following documentation at <http://www.nettonet.com/support/docs> for further information:

DOCUMENT	CONTENTS
management module installation instructions (model-specific)	module installation port pinouts parameter defaults parameter configuration options management system capabilities
uplink module installation instructions (model-specific)	module installation port pinouts parameter defaults parameter configuration options
interface module user guides (model-specific)	module installation distance and bandwidth capabilities port pinouts parameter defaults parameter configuration options
CLI Management User Guide	management module initialization instructions command user guide command definitions configuration options common to all management module models configuration options common to all interface module models
NMS Management User Guide	management module initialization instructions screen by screen user guide parameter definitions configuration options common to all management module models configuration options common to all interface module models

3.0 ADDITIONAL INFORMATION

3.1 Fan Module

The IPD4000E fan module is installed vertically to the right of the interface module slots. It comes pre-installed and should not be removed unless it is being replaced. Fan functionality is indicated by a FAN LED on your management module (all models): NO illumination or solid GREEN illumination indicates all fans are currently functioning, solid AMBER illumination indicates one or more of the four fans are no longer functioning.



CAUTION Do not operate the IPD4000E without a fan module or with a fan module that is not functioning properly.

3.2 IPD4000E Interface Capacity

4 interface module slots
1 management module slot
8 RJ21 50-pin female Telco connectors

3.3 Technical Support

3.3.1 Net to Net Technologies' Web Site

The following information can be found at <http://www.nettonet.com/support> :

DSL Distance and Bandwidth Quick Reference Chart
Firmware Downloads (for applicable modules)

Frequently Asked Questions
Net to Net Enterprise MIBs
Product Discontinuation Notices
Product Documentation
Visio Network Diagram Stencils

3.3.2 Technical Support Engineers

If you are unable to locate the answers to your questions online, please contact Net to Net Technologies' Technical Support Department directly:

CUSTOMER LOCATION	TECH SUPPORT EMAIL	TECH SUPPORT PHONE
Europe, Middle East and Africa	support-emea@nettonet.com	44-0-1635-570953
United States	support@nettonet.com	1-877-638-2638
all other locations	support@nettonet.com	1-603-427-0600

3.4 Regulatory Compliance

NEBS: GR-63-CORE; GR-1089-CORE

EMC: FCC Part 15; CSA/C108.8; EN55022; EN55024

SAFETY: UL 60950-1 1st Edition, UL Marking; CSA 22.2 No. 60950-1-03; EN60950-1:2001; CE Marking

TELECOM: ACTA968 (Part 68); ICCS-03; TBR12; TBR13

3.4.1 Site Selection Criteria

In choosing a location for the installation of this product:

- Select a RESTRICTED ACCESS area where admittance is limited to trained and authorized service personnel.
- Ensure that the internal temperature of a rack containing this equipment will not exceed the maximum recommended ambient temperature of 149°F (65° C).
- Place the chassis such that connecting cables will not become a tripping hazard or pull loose from the chassis.
- Do not block power supply vents or otherwise restrict airflow when installing this equipment.
- Ensure that installation of this equipment in a rack will not cause the rack to become top-heavy or unstable.
- Do not overload the electrical branch circuit of the power source for this equipment.
- For tabletop use, attach the enclosed rubber feet to the bottom of the chassis.
- For rack installation, attach the enclosed rack mount brackets to the sides of the chassis with the screws provided.

3.4.2 Class A Equipment

3.4.2.1 US Federal Communications Commission (FCC)

Note: This equipment has been tested and found to comply with the limits 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 the instruction manual, 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.

Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

3.4.2.2 Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

3.4.2.3 Europe

This Class A product complies with European Norm EN55022.

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures to correct the situation.

© Copyright 2004 Net to Net Technologies, Inc.
™ The Net to Net Logo is a trademark of Net to Net Technologies, Inc.

Worldwide Headquarters

Net to Net Technologies
112 Corporate Drive
Portsmouth, NH 03801
USA
+1 877-638-2638
support@nettonet.com

<http://www.NetToNet.com/>

EMEA Headquarters

Net to Net Technologies
Victoria House 19 Park Way
Newbury Berkshire RG14 1EE
UK
+44 (0) 1635 570950
support-emea@nettonet.com