

PowerStar™ IV

(PSIV-2/14-11, PSIV-2/14-45)

7367.D

For assistance in installing, using, or maintaining the TRANSITION Networks PowerStar™ IV, contact TRANSITION Networks Technical Support at:

(800) 260-1312

or contact your local distributor.

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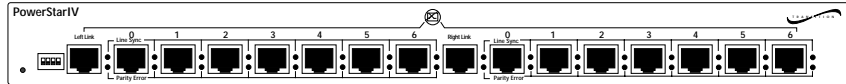
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1. INTRODUCTION

This guide is intended for the system or network administrator responsible for installing and monitoring a TRANSITION Networks PowerStar™ IV. A working knowledge of AS/400™ peripheral connections and operations, including familiarity with communications protocols used, is assumed.

The PowerStar™ IV

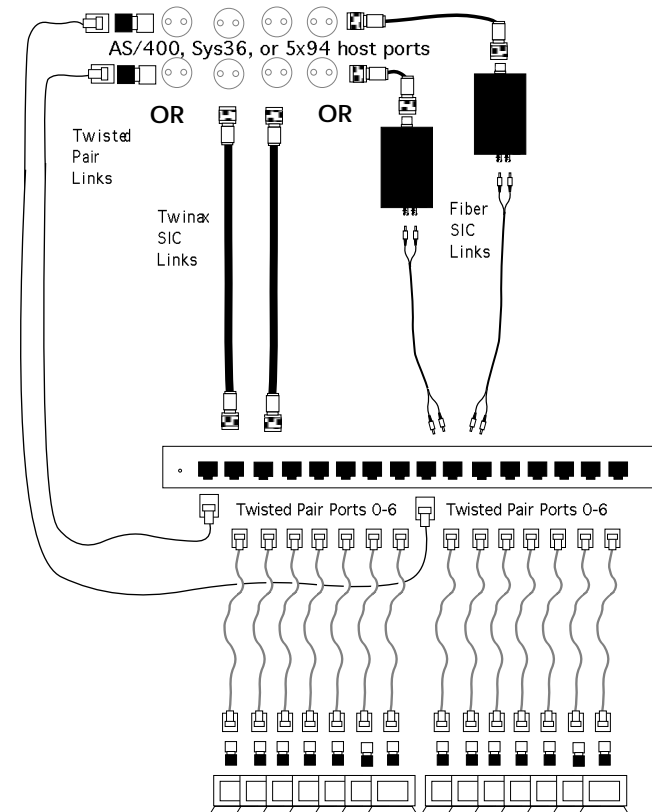
The PowerStar™ IV (PSIV-2/14-11, PSIV-2/14-45) is an active star repeater for AS/400™ and S/3x environments that can be used for converting a twinax daisy chain topology to an unshielded twisted pair star topology.



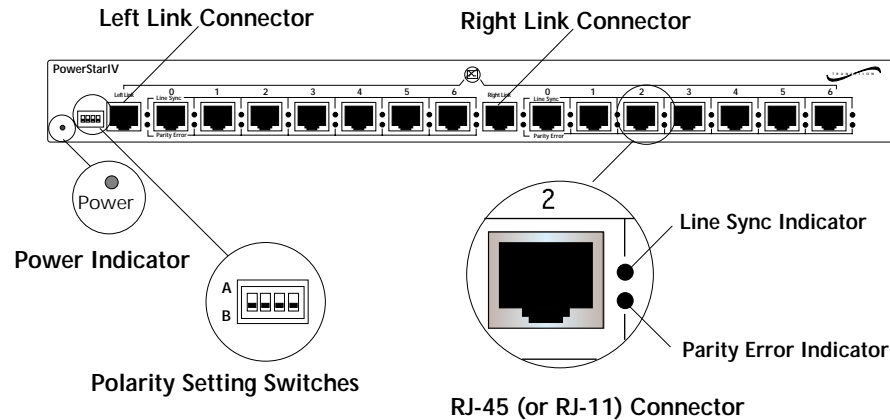
- The PowerStar IV is designed to support all 5250 compliant devices operating at approximately 1Mbps.
- Host controller link can be connected either through a twisted pair connector at the front of the PowerStar™ IV or, if one of the optional Slide-In Cards (SICs) is installed, through twinax or fiber connectors at the back of the PowerStar™ IV.
- Twisted pair port connections are identified, by PowerStar™ IV model number as either RJ-11 or RJ-45 connectors.
- Separate transceiver circuitry isolates each port.
- The following pin configurations are selectable:
 - RJ-11** pins 3 & 4 or 2 & 5 optionally active (factory default: pins 3 & 4 active)
 - RJ-45** pins 1 & 2, 3 & 6, or 4 & 5 optionally active; (factory default: pins 4 & 5 active).

Networking the PowerStar™ IV

The PowerStar™ IV distributes two host input signals from an AS/400, Sys36, or 5x94 remote controller, over twinax, fiber, or twisted pair media, to fourteen terminal devices. All signals to the terminal devices are over twisted pair.



Connectors, Switches and Status Indicators



Connectors

One **Left Link** (host) connector and one **Right Link** (host) connector are located at the front of the PowerStar™ IV. These connectors each provide an RJ twisted pair link to AS/400™ or S/3x host signals. Fourteen (14) terminal device connectors, labeled **0, 1, 2, 3, 4, 5, or 6**, provide RJ twisted pair connection for distributing the AS/400™ or S/3x host signals to terminal devices such as computer terminals and printers. The port connectors are arranged in sets of seven which are located next to each of the link connectors.

(AT BACK) Slide-In cards (SICs), when installed, provide either twinax host connectors or fiber TX and RX host connectors. A connector to external **power** also is located at the back of the PowerStar™ IV.

Switches

The **Polarity Setting Switches** are used to set the polarity sense of the active RJ pins for the Link (host) and Port (terminal device) connections.

Status Indicators (LEDs)

Line Sync and **Parity Error** Status Indicators (LEDs) are provided next to each twisted pair RJ connector for monitoring data transfer.

The **Power** LED indicates PowerStar™ IV connection to external power.

2. SITE CONSIDERATIONS

The site for the PowerStar™ IV must provide:

- AC power outlet for each Powerstar™ IV
- Adequate ventilation
- Standard environmental conditions
- Isolation from electrical noise, including radio transmitters and broadband amplifiers, motors, high power electrical lines, or fluorescent light fixtures.

Additionally:

- The twisted pair cables should not run in the same conduit with power line cables,
- Phone lines should be separated from data cables,
- Flat or "silver satin" wires should not be used.

And:

- Unshielded twisted pair, twinax, and fiber optic cable lengths must be greater than 25 feet (7.6 meters),
- If twisted pair cable is used, the RJ-11 or RJ-45 connector pin settings must be configured as shown on page 8, compatible baluns must be selected according to the chart below, and the polarity switch must be set as shown on page 18.

Connector	Pins	TN Balun
RJ-11	3 & 4	3-1134
RJ-11	4 & 3	3-1143
RJ-11	2 & 5	3-1125*
RJ-11	5 & 2	3-1152
RJ-45	1 & 2	3-4512
RJ-45	2 & 1	3-4521
RJ-45	3 & 6	3-4536
RJ-45	6 & 3	3-4563
RJ-45	4 & 5	3-4545
RJ-45	5 & 4	3-4554

*Same active pins as used in IBM baluns P/Ns 69x7883 and 96x6187.

3. INSTALLATION

To install the PowerStar™ IV:

- Unpack the PowerStar™ IV.
- Optionally set pin jumpers.
- Optionally install SIC card.
- Install PowerStar™ IV in rack or on table.
- Set Polarity Settings switches.
- Connect link cable to host.
- Connect port cable to terminal devices.
- Connect the PowerStar™ IV to power.

Direction is provided in the pages that follow.

Unpacking the PowerStar™ IV

The PowerStar™ IV packing contents should include the following:

Item	Part Number
PowerStar™ IV Power Cord	PSIV-2/14-11 OR PSIV-2/14-45 3344, 3347, 3348, 3349, or 3523, (depending upon power configuration in country where installed)
User's Guide	7367

In addition, any of the following optional SICs may be included:

Item	Part Number
Twinax SIC	PS-T-SIC
Fiber SIC	PS-F-SIC

Optionally Setting Pin Jumpers

NOTE: The default factory setting makes pins 3 & 4 active in the RJ-11 connector and pins 4 & 5 active in the RJ-45 connector.

NOTE: Since pin jumpers are located *inside* the PowerStar IV, the PowerStar™ IV cover must be removed when setting the pin jumpers.

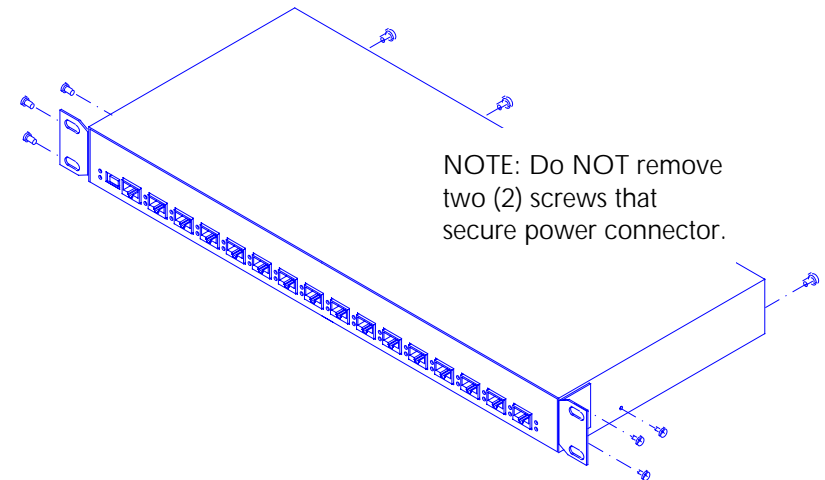
WARNING: DISCONNECT POWER CORD from PowerStar™ IV before setting jumper pins. Failure to observe this warning could result in personal injury or death from electrical shock.

WARNING: AVOID CONTACT WITH POWER SUPPLY during jumper pin setting. Failure to observe this warning could result in personal injury from electrical shock caused by capacitive discharge.

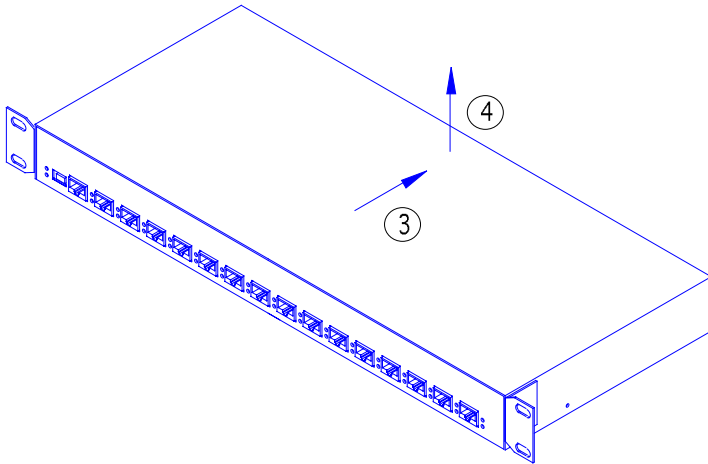
CAUTION: Wear a grounding device and observe electrostatic discharge precautions when setting pin jumpers. Use needle nosed pliers with insulated handle. Failure to observe this caution could result in circuit board failure.

To verify or modify the jumper pin settings:

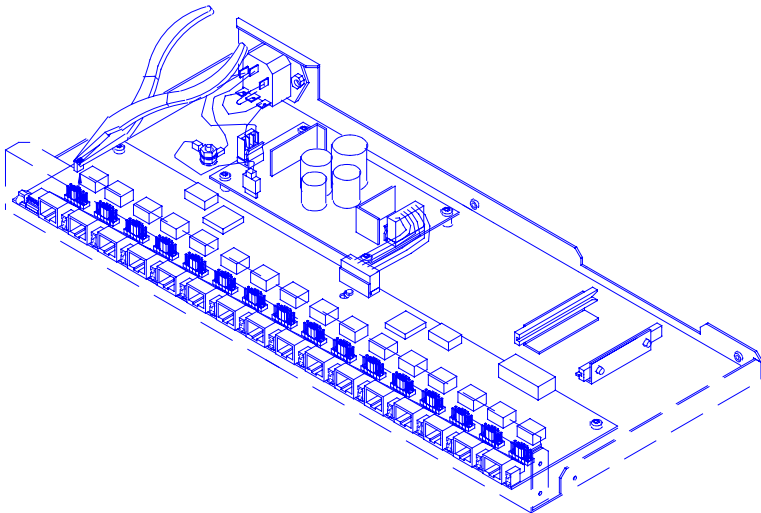
1. Place PowerStar™ IV on table or other stable surface.
2. Using medium Phillips screwdriver, remove three (3) screws that secure cover to PowerStar™ IV left side, three (3) screws that secure cover to PowerStar™ IV right side, and three (3) screws that secure cover to PowerStar™ IV back.



- Slide PowerStar™ IV cover back approximately one inch to disengage cover from chassis.

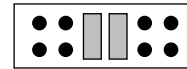


- Carefully lift PowerStar™ IV cover and remove.
- Using needle nose pliers with insulated handle and referring to reference material on the next page, move jumpers as required to change factory default active pin settings to active pin settings for the site.



- Rotate PowerStar™ IV cover to rest again on chassis.
- Slide cover forward to engage cover against chassis.
- Replace cover screws.

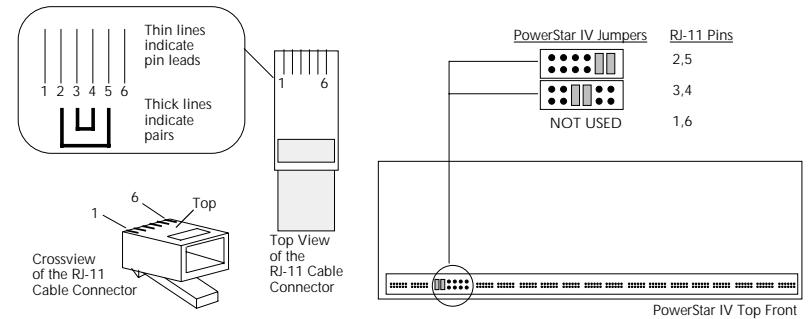
Pin Settings



The default factory setting for both RJ-11 and RJ-45 configurations is two centered jumpers. This default setting activates pins 3 & 4 in the RJ-11 connector and pins 4 & 5 in the RJ-45 connector.

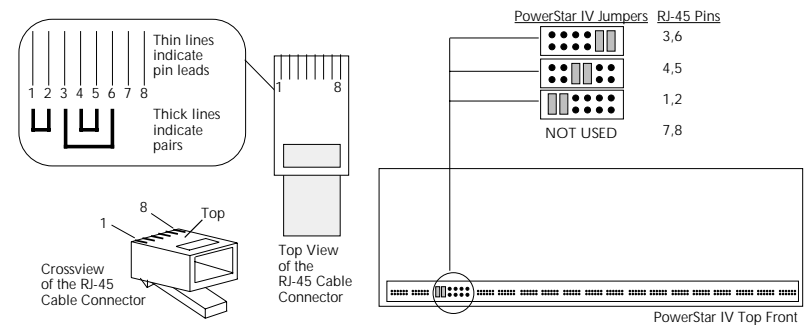
RJ-11 Pin Settings

Verify that the jumper locations activate the pins required for the installation.



RJ-45 Pin Settings

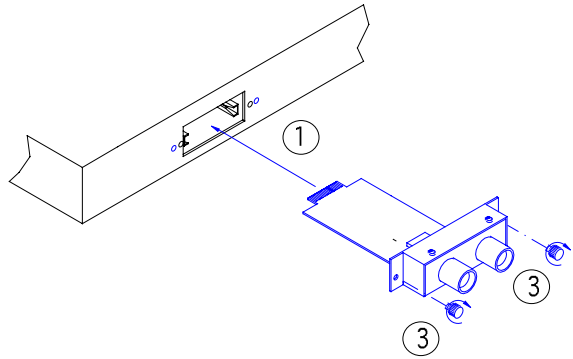
Verify that the jumper locations activate the pins required for the installation.



Optionally Installing Slide-In Cards

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when installing Slide-In Cards. Failure to observe this caution could result in circuit board failure.

To install a Slide-In Card:

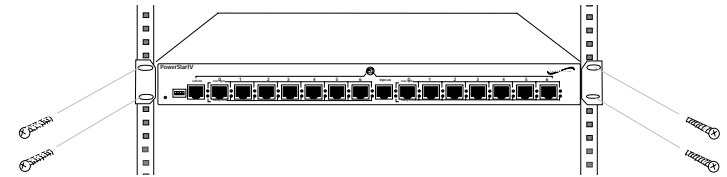


1. With the Slide-In Card components facing up, carefully guide the Slide-In Card along the card guides until the Slide-In Card connector meets the the PowerStar™ IV edge receptor.
2. Firmly push the card into the slot until the Slide-In Card faceplate is flat against the PowerStar™ IV frame.
3. Rotate the two Slide-In Card thumbscrews into the PowerStar™ IV threaded holes.

Installing PowerStar™ IV in Rack or on Table

NOTE: The PowerStar™ IV is shipped with attached brackets for standard 19-inch rack installation and with attachable feet for table-top installation. Rackmount screws and clip nuts are NOT provided.

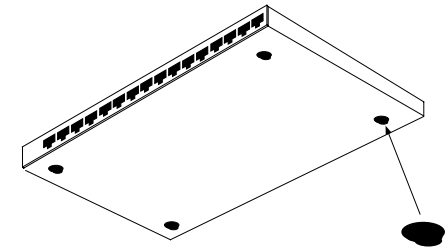
To install the PowerStar™ IV in 19-inch rack:



1. Locate four (4) screws (and clip nuts, if necessary) for each PowerStar™ IV to be installed.
2. Carefully align the PowerStar™ IV between the 19-inch rack mounting rails at the installation position.
3. Install two screws through right front bracket and two screws through left front bracket, using clip nuts if necessary.

CAUTION: The rubber feet **MUST BE INSTALLED** if the PowerStar™ IV is installed on a table-top or other flat surface. Failure to observe this caution could cause the PowerStar™ IV to overheat and could result in data transmission failure and/or equipment damage.

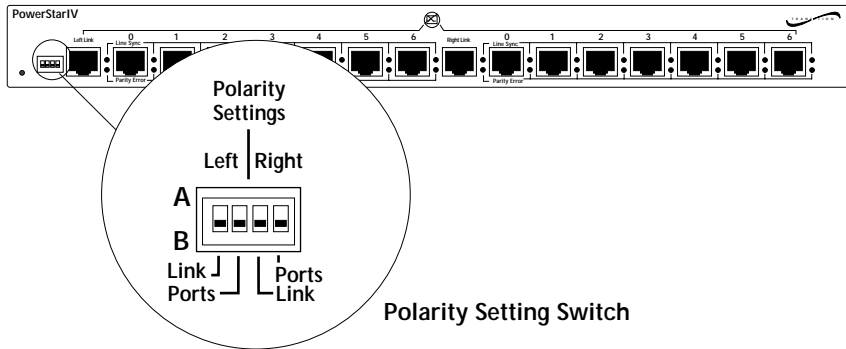
To install the PowerStar™ IV on table or other flat surface:



1. Carefully turn PowerStar™ IV to side.
2. Install four (4) rubber feet:
 - Remove protective paper from rubber foot adhesive surface.
 - Position rubber foot at bottom corner of repeater hub.
 - Press rubber foot against PowerStar™ IV surface to secure.
 - Repeat for remaining rubber feet.
3. Return PowerStar™ IV to upright position.

Setting Twisted Pair Polarity Switches

There are two sets of polarity switches at the PowerStar™ IV front – one set for the left controller or host port and seven device ports and one set for the right controller or host port and seven device ports. The A-B switch settings reverse the polarity of the twisted pair connector active pins.



The factory default setting is "A". The following chart shows, for various connector/pin options, the correct A-B switch setting and compatible TRANSITION Networks baluns.

Connector	Pins	External Polarity Switch Setting	Compatible TN Balun
RJ-11	3 & 4	A	3-1143
RJ-11	"	B	3-1134
RJ-11	2 & 5	A	3-1152
RJ-11	"	B	3-1125
RJ-45	1 & 2	A	3-4521
RJ-45	"	B	3-4512
RJ-45	3 & 6	A	3-4563
RJ-45	"	B	3-4536
RJ-45	4 & 5	A	3-4554
RJ-45	"	B	3-4545

NOTE: Set the Link Ports polarity switch to "A" when installing twinax cable to the host.

Powering the PowerStar™ IV

To power ON the PowerStar™ IV:

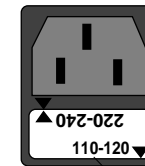
1. At PowerStar™ IV back, locate the power receptacle and associated fuse.

NOTE: Fuse must be installed at correct setting for power source voltage before connecting to AC outlet.

2. Verify that fuse is installed at correct setting for power source voltage.

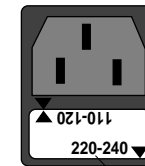
NOTE: The installed fuse rating is indicated by the reading at lower right corner of fuse holder.

110-120 Orientation



Fuse Holder

220-240 Orientation



Fuse Holder

If not installed at correct setting for power source voltage:

- Carefully open fuse receptacle, using a small flat blade screwdriver.
 - Rotate fuse holder 180° to the correct rating orientation.
 - Install fuse holder in correct rating orientation.
 - Close fuse receptacle.
3. Plug unit end (female) of power cord into PowerStar™ IV power receptacle.
 4. Plug outlet end (male) of power cord into correct voltage AC wall socket.
 5. At PowerStar™ IV front, verify that POWER LED is illuminated.

Connecting Link Cable to Host

Connect the AS/400, Sys36, or 5x94 remote controller host to the PowerStar IV using either twisted pair, twinax or fiber cable.

NOTE: All cable lengths must be greater than 25 feet (7.6 meters).

Connecting Twisted Pair Link Cable

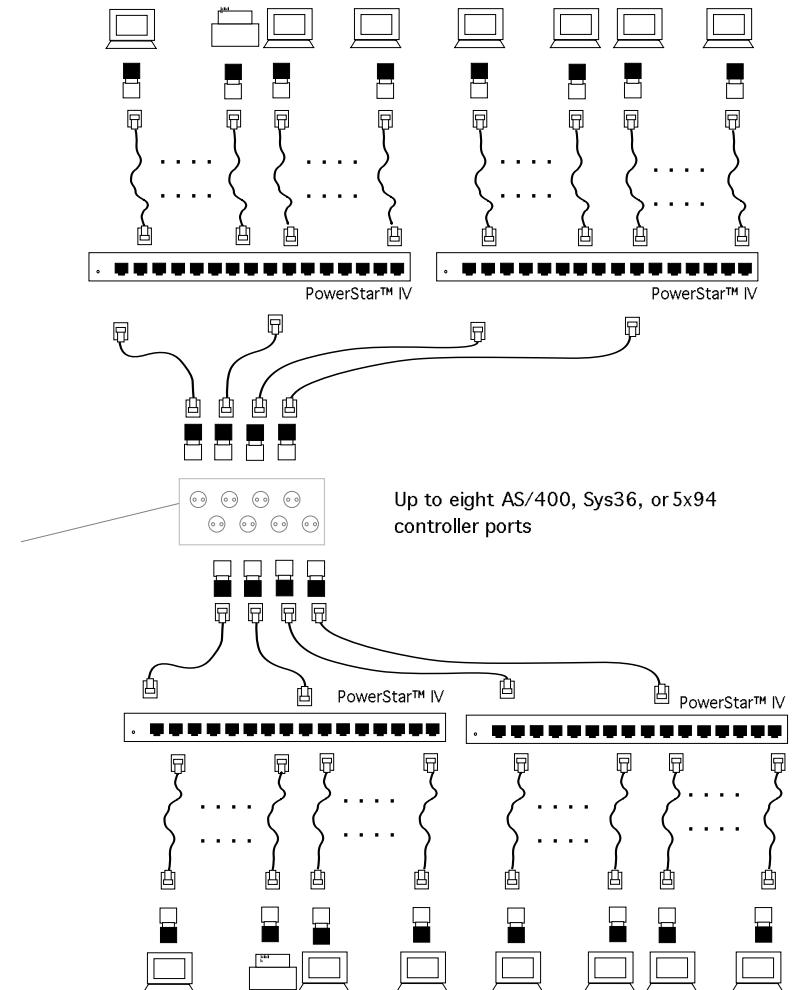
When installing twisted pair cable, attach a balun to the AS/400™ or S/3x twinax port, then attach the twisted pair cable between the balun and the RJ Link connector on the PowerStar IV.

CAUTION: Do NOT use a balun to connect twisted pair cable to twinax cable. A mid-link media change may degrade the signal and result in data loss.

NOTE: When twisted pair cable is used, compatible baluns must be selected according to the chart on page 4, the RJ-11 or RJ-45 connector pin settings must be configured as shown on page 8, and the polarity switch must be set as shown on page 18.

To connect link cable to PowerStar™ IV link connectors:

1. Locate or build twisted pair cables that conform to specifications on page 23 and to conditions noted above, with minimum length of 25 feet (7.6 meters) and with male RJ-11 or RJ-45 plug connectors installed at both cable ends.
2. Connect male RJ-11 or RJ-45 plug connector at one end of cable to a Link port on the PowerStar™ IV RJ-11 or RJ-45 jack connector.
3. Connect balun to the twinax port on the host computer.
4. Connect male RJ-11 or RJ-45 plug connector at other end of cable to balun installed on the host in step 3.

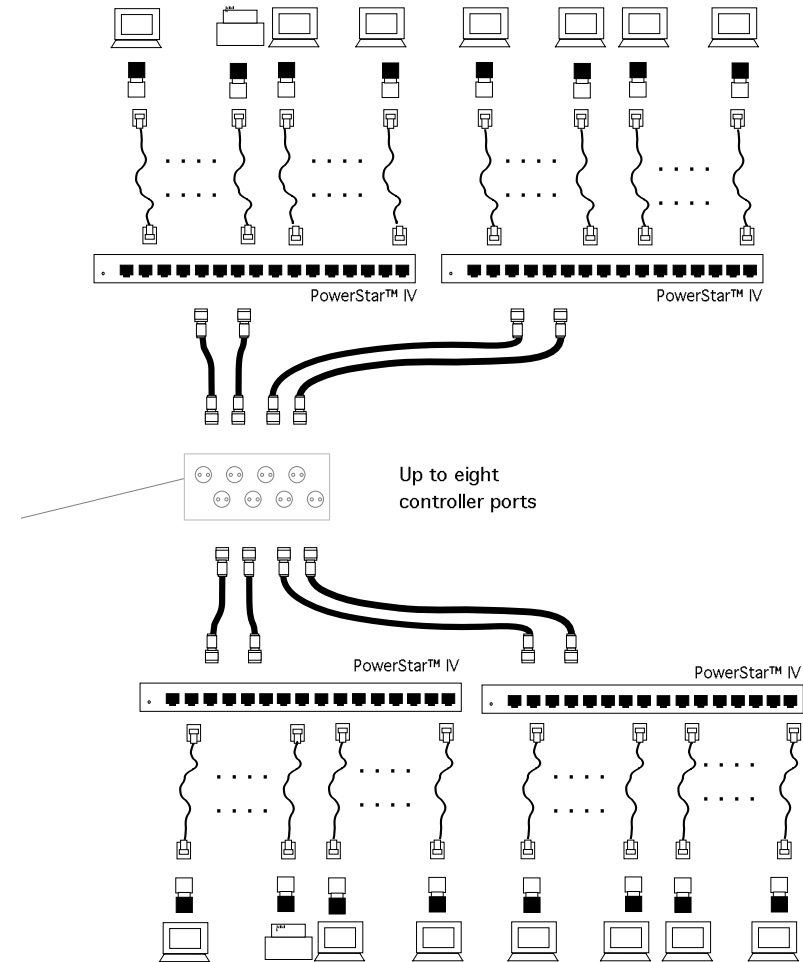


Connecting Twinax Link Cable

To connect twinax cable to PowerStar™ IV SIC twinax connector:

NOTE: Twinax link connections are marked on the Slide In Card as Right or Left. The Right twinax connection provides signals to the Right Link terminal device connectors; the Left twinax connection provides signals to the Left Link terminal device connectors. If only one twinax link is installed, the choice of selecting left or right connection is left to the discretion of the installer.

1. Be sure that the twinax SIC is installed properly. (See page 9)
2. Locate or build twinax cables that conform to specifications on page 24, with minimum length of 25 feet (7.6 meters) and maximum length of 5000 feet.
3. Connect one end of twinax cable to AS/400, Sys/36, or 5x94 controller port.
4. Connect other end of twinax cable to twinax connector on Slide In Card.
5. Optionally connect second twinax cable, using steps 3 and 4 above.



Connecting Fiber Link Cable

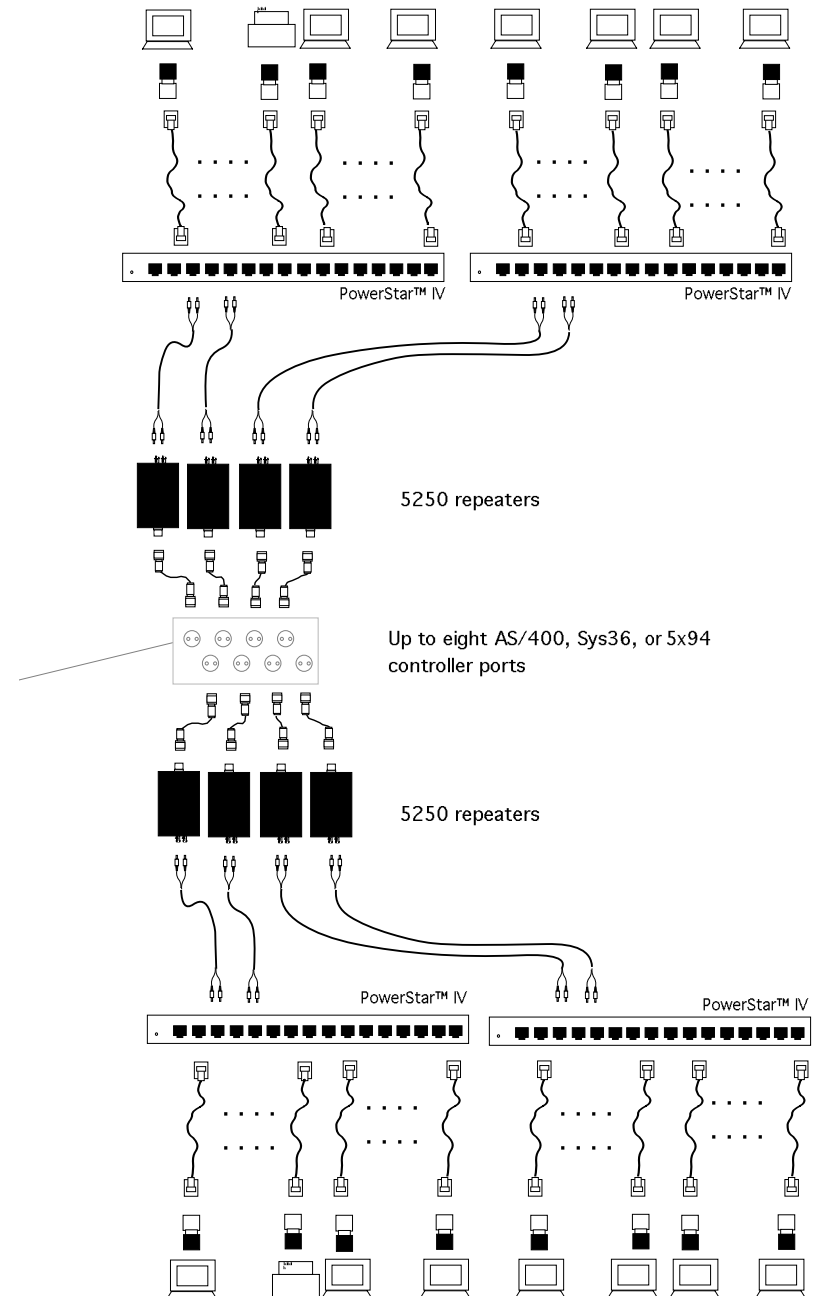
NOTE: Fiber link connections are marked on the Slide In Card as Right or Left. The Right fiber connection provides signals to the Right Link terminal device connectors; the Left fiber connection provides signals to the Left Link terminal device connectors. If only one fiber link is installed, the choice of left or right location is left to the discretion of the installer.

To connect fiber cable to PowerStar™ IV SIC fiber connector:

1. Be sure that the fiber SIC is installed properly. (See page 9.)
2. For EACH host connection:
 - Locate one (1) TRANSITION Networks Twinax to Fiber Converter (5250-CV-T-F/11).
 - Locate or build 2-stranded fiber cables that conform to specifications on page 24, with minimum length of 25 feet (7.6 meters) and maximum length of 3,000 meters (10,000 feet), and with male TX/RX connectors at both cable ends.
3. Install Twinax to Fiber 5250 Repeater (5250-CV-T-F/11) at AS/400, Sys/36, or 5x94 controller port. (See Twinax to Fiber 5250 Repeater User's Guide 7336 for direction.)

NOTE: Fiber is installed by connecting one strand of the fiber cable from the TX connector on the 5250 Repeater to the RX connector on the Slide In Card and by connecting the other strand of the fiber cable from the RX connector on the 5250 Repeater to the TX connector on the Slide In Card

4. Connect fiber cable from 5250 Repeater to fiber connector on Slide In Card.
5. Optionally connect second fiber cable from second 5250 Repeater to second fiber connector on Slide In Card, using steps 3 and 4 above.



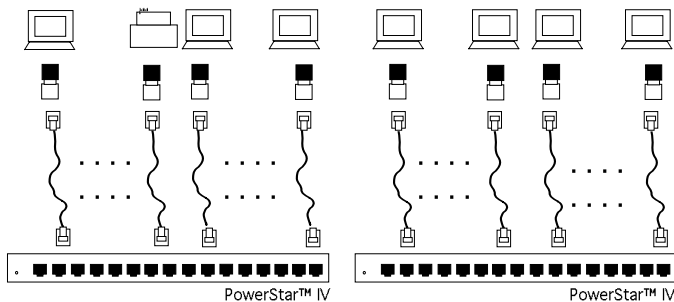
Connecting Port Cable to Terminal Devices

NOTE: When twisted pair cable is used, compatible baluns must be selected according to the chart on page 4, the RJ-11 or RJ-45 connector pin settings must be configured as shown on page 8, and the polarity switch must be set as shown on page 18.

NOTE: Terminal devices must be connected ONLY to port connectors that carry an installed link signal.

To connect twisted pair cable from PowerStar™ IV ports to terminal devices:

1. Locate or build twisted pair cables that conform to specifications on page 23 and to conditions noted above, with minimum length of 25 feet (7.6 meters) and with male RJ-11 or RJ-45 plug connectors installed at both cable ends
2. Install balun at terminal device RJ-11 or RJ-45 jack connector.
3. Connect male RJ-11 or RJ-45 plug connector at one end of cable to balun.
4. Connect male RJ-11 or RJ-45 plug connector at other end of cable to PowerStar™ IV RJ-11 or RJ-45 jack connector.
5. Repeat steps 1-4 until all terminal devices are installed.



4. OPERATION

The PowerStar™ IV normally requires no intervention beyond occasionally monitoring the status LEDs.

5. MAINTENANCE

WARNING: DO NOT, UNDER ANY CIRCUMSTANCES, open and attempt to repair the PowerStar™ IV. Failure to observe this warning could result in personal injury or death from electrical shock.

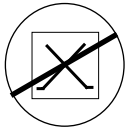
NOTE: Failure to observe the above warning will immediately void the warranty.

Technical Support Contact

For assistance in fault isolation and in maintaining the PowerStar™ IV, contact:

Technical Support (800) 260-1312

or your local distributor.



CAUTION: RJ connectors are NOT INTENDED FOR CONNECTION TO THE PUBLIC TELEPHONE NETWORK. Failure to observe this caution could result in damage to the public telephone network.

Der Anschluss dieses Gerätes an ein öffentliches Telekommunikationsnetz in den EG-Mitgliedstaaten verstösst gegen die jeweiligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.

Compliance Information

UL Listed

C-UL Listed (Canada)

CISPR/EN55022 Class A

FCC Regulations

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 the user's own expense.

Canadian Regulations

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out on the radio interference regulations of the Canadian Department of Communications.

European Regulations

Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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PowerStar™ IV Technical Specifications

Host Connection

IBM® S/3x (System 34, 36, 38), AS/400™ Host or AS/400™ Controllers

Physical Dimensions

17.0" x 7.5" x 1.7" (432 mm x 191 mm x 43 mm)

Universal Power Supply

Input Range: 85 to 265 VAC at 47 to 63 Hz. Rated at 40 watts maximum.

AC Input:

TE PN	Requirement	Location
3344	120 volts, 60 hertz	USA/Canada/Mexico
3344	100 volts, 50-60 hertz	Japan
3347	230 volts, 50 hertz	Europe
3348	240 volts, 50 hertz	Australia
3349	240 volts, 50 hertz	United Kingdom

MTBF:

67026 hours including power supply
203207 hours NOT including power supply

Environment

Temperature: 0-50°C (32° to 122° F)
Humidity: 10-90%, non condensing
Altitude: 0-10,000 feet

Warranty

Lifetime

AS/400 and S/36 Cable Specifications

Twisted Pair Cable and Connector Specifications

The physical characteristics of the twisted pair cable must meet or exceed the following:

Category 3 wire or better is required; category 5 wire is recommended. Either shielded twisted pair (STP) or unshielded twisted pair (UTP) can be used.

Gauge	26 to 22 AWG
Attenuation	Less than 11.5 dB @ 5-10 MHz
Differential Characteristic Impedance	85 -110 Ω @ 10 MHz
DO NOT USE FLAT OR "SILVER SATIN" WIRE.	

Minimum Cable Distance:

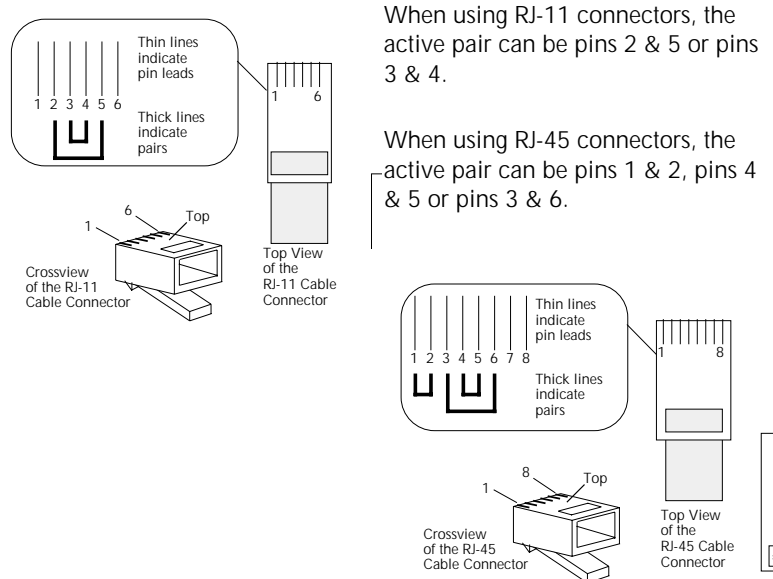
Host to Product	7.6 meters (25 feet)
Product to Product	7.6 meters (25 feet)
Product to Terminal Device	7.6 meters (25 feet)

Maximum Cable Distance:

Host to Product	762 meters (2500 feet)
Product to Product	762 meters (2500 feet)
Product to Terminal Device	762 meters (2500 feet)

Connector Characteristics:

Twisted pair connection requires one active pair configured as straight through.



Fiber Cable and Connector Specifications

The physical characteristics of the fiber cable must meet or exceed the following:

Cable Characteristics:

Fiber Optic Cable Recommended:	62.5 / 125 μ m multimode fiber
Optional:	100 / 140 μ m multimode fiber 85 / 125 μ m multimode fiber 50 / 125 μ m multimode fiber
Fiber Optic Transmitter Power:	Average power: -15.0 dBm Peak power: -12.0 dBm \pm 1dBm
Fiber Optic Receiver Sensitivity:	Average sensitivity: -27.4 dBm Bit error rate: $\leq 10^{-10}$

Minimum Cable Distance:

Host to Product	7.6 meters (25 feet)
Product to Product	7.6 meters (25 feet)
Product to Terminal Device	not applicable

Maximum Cable Distance:

Host to Product	3000 meters (10,000 feet)
Product to Product	3000 meters (10,000 feet)
Product to Terminal Device	not applicable

Connector Characteristics:

ST type connectors (SMA type available upon request)

Twinax Cable and Connector Specifications

Cable Characteristics:

Twinax cable consists of conductors - one tinned and one solid copper - in a tinned copper braid shield, with impedance of 100 ohms.

Cable Type	IBM PN or equivalent
Twinax Plenum	7362061
Twinax PVC	7362211

Minimum Cable Distance:

Host to Product	7.6 meters (25 feet)
Product to Product	7.6 meters (25 feet)
Product to Terminal Device	not applicable

Maximum Cable Distance:

Host to Product	1500 meters (5,000 feet)
Product to Product	1500 meters (5,000 feet)
Product to Terminal Device	not applicable

Connector Characteristics:

Twinax connectors (IBM or equivalent) can be connected to twinax cable. (The last twinax connection in a daisy-chain must be terminated.)