

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.

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

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.

Achtung !

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in weichen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention !

Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées



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.

Trademark Notice

All registered trademarks and trademarks are the property of their respective owners.

Copyright Restrictions

© 2000, 2001 TRANSITION Networks.

All rights reserved. No part of this work may be reproduced or used in any form or by any means – graphic, electronic, or mechanical – without written permission from TRANSITION Networks.

Printed in the U.S.A.

33184.B



Minneapolis, MN 55344 USA

IBM™ 5250 Protocol Multiplexer with Fiber Link PSM-8E USER'S GUIDE

Designed to be networked with TRANSITION Networks PowerStar™ hubs, the TRANSITION Networks PowerStar Express Multiplexer (PSM-8E) is a site-configurable multiplexer used for extending IBM 5250* protocol network distances over fiber.



*IBM 5250 protocol products include the IBM® System 34, 36, 38, and AS/400, remote controllers, and many supporting devices manufactured by IBM and other companies.

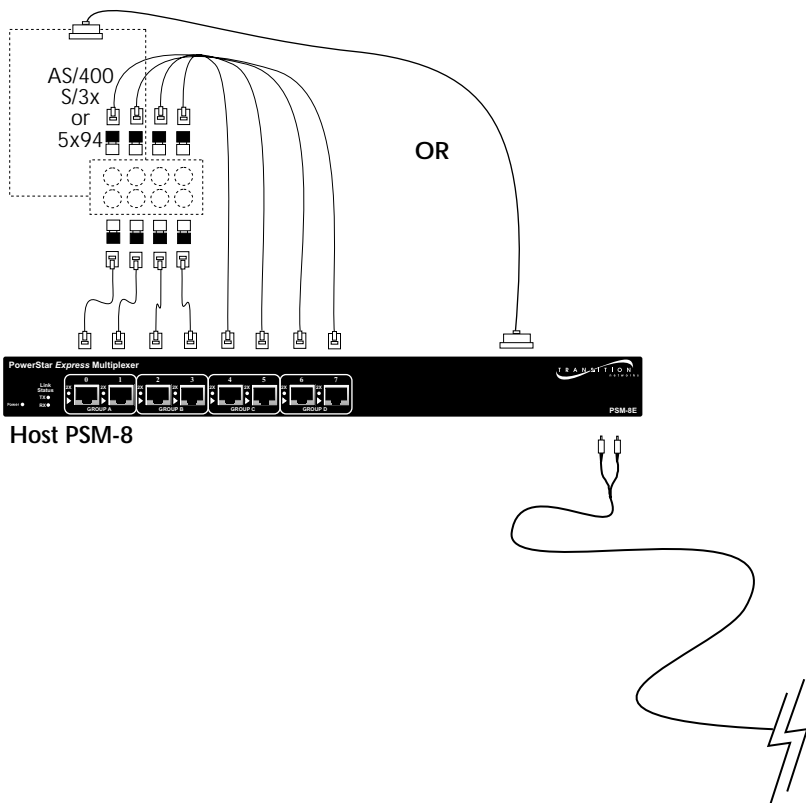
The PSM-8E allows multiple AS/400, System 3x, or remote controller polling groups to be transmitted over a single fiber-optic pair, providing maximum throughput in either 1 Mb/s *Optimized* mode or in 2 Mb/s *Express* mode by transparently multiplexing the 5250 "split-polling" feature. (All new IBM controllers support "split-polling" as a means of achieving higher throughput rates, even when connected to standard legacy devices. The PSM-8E uses "split-polling" to increase performance up to four times over the standard legacy 1 Mb/s 5250 protocol.)

NOTE: Refer to IBM 5250 *Express* reference material available from network vendors when installing the PowerStar Express Multiplexer or PowerStar™ in a 5250 *Express* network.

PSM-8E in the Network	2
Installation	4
Operation	11
Fault Isolation and Correction	12
Cable Specifications	14
Technical Specifications	15
Compliance Information	16

PSM-8E IN THE NETWORK

Install one **host PSM-8E** multiplexer and one or more **device PSM-8E** multiplexer(s) in the network to extend, over fiber, the distance between a AS/400, System 3x, or remote controller and 5250 protocol network devices.



Host PSM-8


A DB-25 connector at the back of the PSM-8E allows a single **host PSM-8E** connection to an AS/400 over twisted-pair cable.

Eight (8) RJ-45 connectors at the front on the PSM-8E allow a **host PSM-8E** connection to an AS/400, System 3x, or remote controller over twisted-pair cable (using RJ-45 connectors and baluns, with twinax "bricks" as necessary).

NOTE: The eight RJ-45 connections at the front of the PSM-8E are divided into two polling groups of four connections each. Polling group #1 is the set of connections labeled A and B and numbered 0-3. Polling group #2 is the set of connections labeled C and D and numbered 4-7. *Ports within a polling group must be connected to ports from a common controller.* (A major difference between the newer AS/400 work station controllers (WSC) and the older WSCs is the number of polling groups. The older WSCs had one polling group for all eight ports. The newer WSCs have two polling groups: ports 0-3 comprise one polling group and ports 4-7 comprise the other polling group.)

TECHNICAL SPECIFICATIONS

Protocol	5250
Data Rate	1 Mb/s & 2 Mb/s (<i>transparent</i>)
Number of Ports	Eight (8)
Host Connection	IBM® S/3x (System 34, 36, 38) host, AS/400™ host or 5x94 remote controller
Dimensions	19" x 1.75" x (6" + 2.75" external power supply)
Power	Input Range: 90 to 250 VAC at 50 or 60 Hz
Environment	Operating Temperature: 0° to 50°C (32° to 122° F) Storage Temperature: -20 to 85°C Humidity: 5% to 95%, non condensing Altitude: 0 to 10,000 feet
Warranty	Lifetime

TRANSITION NETWORKS		DECLARATION OF CONFORMITY	
Name of Mfg:	Transition Networks	6475 City West Parkway, Minneapolis MN 55344 USA	
Model:	PSM-8E 5250 Express Multiplexer		
Part Number:	PSM-8E		
Regulation:	EMC Directive 89/336/EEC		
Purpose:	To declare that the PSM-8E to which this declaration refers is in conformity with the following standards.		
	EMC-CISPR 22: 1985 Class A; EN 55022: 1988 Class A; EN 50082-1:1992; EN 60950 A4:1997; IEC 801.2, IEC 801.3, and IEC 801.4; IEC 950		
	<i>I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).</i>		
		May 10, 2000	
	Stephen Anderson, Vice-President of Engineering	Date	

CABLE SPECIFICATIONS

Twisted Pair Copper Cable and Connectors

CABLE 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. DO NOT USE FLAT OR SILVER SATIN WIRE.

Gauge	24 to 22 AWG
Differential Characteristic Impedance	100 Ω ±10% @ 10 MHz
Category 3 Attenuation	28 dB/1000' @ 10 MHz
Category 5 Attenuation	20 dB/1000' @ 10 MHz

NOTE: The active pair in a twisted-pair copper 5250-compliant network are pins 4 & 5, pins 3 & 6, or pins 1 & 2, straight-through configuration. Use dedicated wire pairs (such as blue/white & white/blue, orange/white & white/orange) for the active pins.

Minimum cable distance MUST be 25 feet.

Typical Maximum Cable Distance:

1X Category 3/Host to PSM-8E	Up to 2000 feet
1X Category 3 /PSM-8E to Device	Up to 1800 feet
2X Category 3 /Host to PSM-8E	Up to 1000 feet
2X Category 3 /PSM-8E to Device	Up to 900 feet
1X Category 5 /Host to PSM-8E	Up to 2000 feet
1X Category 5 /PSM-8E to Device	Up to 2200 feet
2X Category 5 /Host to PSM-8E	Up to 1500 feet
2X Category 5 /PSM-8E to Device	Up to 1650 feet

Derate cable distances as follows:

1X Category 3	Up to 62 feet
2X Category 3	Up to 38 feet
1X Category 5	Up to 16 feet
2X Category 5	Up to 11 feet

NOTE: Cable distances over 1000 feet must be derated by 25% for ring applications.

CONNECTORS

Shielded RJ-45 or DB-25

Fiber Cable and Connectors

CABLE

Fiber Optic Cable Recommended:	62.5 / 125 μm multimode fiber
Optional:	100 / 140 μm multimode fiber
	85 / 125 μm multimode fiber
	50 / 125 μm multimode fiber

Peak Power Wavelength: 820 nanometers

Typical Maximum Cable Distance:

Point-to-point	Up to 2 kilometers
Ring (3 units)	Up to 1.5 kilometers between units and 4.5 kilometers overall
Ring (4 units)	Up to 1 kilometers between units and 4 kilometers overall

Fiber-optic Link Budget:

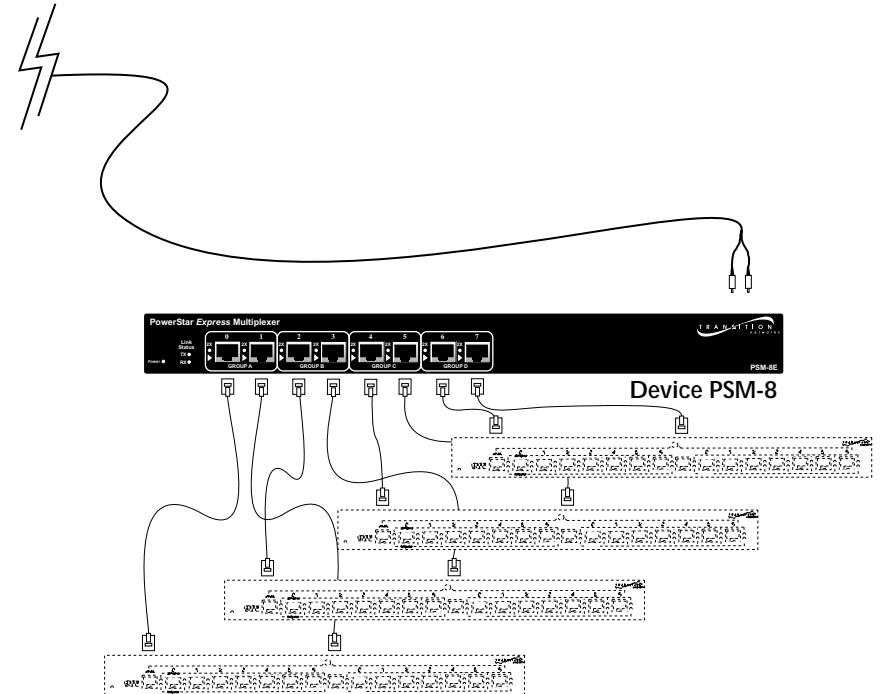
Point-to-point	12 dB (typical)
Ring (3 units)	10 dB (typical)
Ring (4 units)	8 dB (typical)

CONNECTORS

ST

Multiplexed signals are carried over fiber from the **host PSM-8E** multiplexer to one or more **device PSM-8E** multiplexer(s).

NOTE: If more than one device PSM-8E multiplexer is connected to the host PSM-8E multiplexer, the PSM-8E multiplexers and fiber connection must be set up in a ring configuration. (See page 8.)



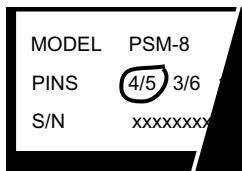
The **device PSM-8E** is designed to be connected over twisted-pair fiber to up to eight (8) TRANSITION Networks PowerStar (or other) devices. PowerStars, in turn, are designed to distribute 5250 protocol signals to up to seven (7) hubs or other network devices.

Refer to TRANSITION Networks PowerStar documentation for more detail.

INSTALLATION

Optionally Modify Jumper Settings

Internal PSM-8E jumpers allow selection among three RJ-45 pin configurations (4 & 5, 3 & 6, 1 & 2) and the DB-25 connection. All PSM-8Es jumpers are factory configured and the factory setting is circled on an identification label located at the rear of the PSM-8E. If required at the installation site, these factory settings can be changed.



NOTE: The DB-25 and the RJ-45 jumper configurations are mutually exclusive. If any of the three RJ-45 options is selected, the DB-25 option is deselected. If the DB-25 option is selected, the RJ-45 options are deselected.

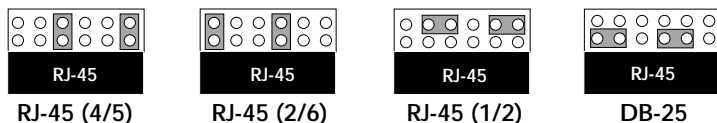
WARNING: Remove AC line cord from power source before modifying jumper settings. Failure to observe this warning could result in personal injury or death.

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when modifying jumper settings. Failure to observe this caution could result in damage to, and subsequent failure of, the PSM-8E.

To modify the PSM-8E jumper settings:

1. Remove PSM-8E top cover.
 - Remove and retain two (2) top cover screws located on rear panel.
 - Gently slide top cover back one inch.
 - Carefully tilt top cover up.
2. Locate eight (8) sets of jumpers positioned behind the eight (8) RJ-45 connectors.
3. Using small screwdriver or similar device and referring to drawing below, reconfigure jumpers as required.

NOTE: JUMPERS SETTINGS FOR ALL EIGHT (8) SETS OF JUMPERS MUST BE IDENTICAL.



4. Replace PSM-8E top cover:
 - Carefully tilt top cover down.
 - Slide top cover forward to align against bottom cover.
 - Install two (2) retained top cover screws.

5. Do devices interfere with each other?

YES

- Is there one and only one host-polling group per PSM-8E polling group?
- Do all devices on star segments have unique addresses?
- Are all devices properly terminated?
- Contact Technical Support: (800) 260-1312.

NO

- Continue at step 6.

6. Are devices able to operate in Express mode?

NO

Note that the controller may have down-shifted to 1 Mb/s due to errors during installation. If this is the case, the controller will wait approximately one hour and then retry the Express mode.

- Are the host AND the device capable of Express mode?
- Do all inter-connecting components support the Express mode?
- Are all devices on the port Express ready?
- Are all cable distances within the Express specification?

YES

- Continue at step 7.

7. Do Express LEDs flash?

YES

Note that if there are fewer than seven devices, the flashing Express LED is normal.

NO

- Continue at step 8.

8. Are Express LEDs ON without data activity?

YES

Note that If the host is disconnected during an Express connection, the Express LED remains on.

- Check host cables for proper connection.
- Contact Technical Support: (800) 260-1312.

NO

- Contact Technical Support: (800) 260-1312.

FAULT ISOLATION and CORRECTION

If the PSM-8E fails, isolate and correct the fault by determining the answers to the following questions and then taking the indicated action:

1. Is the PSM-8E Power LED illuminated?

NO

- Is the LED on top of the external PSM-8E power supply illuminated?
- Is the power cord properly installed in the PSM-8E and in the grounded AC outlet?
- Does the grounded AC outlet provide power?
- Contact Technical Support: (800) 260-1312.

YES

- Continue at step 2.

2. Is the PSM-8E RX LED OFF or FLASHING?

YES

- Are the fiber-optic connectors properly connected?
- Have the fiber-optic budget and distance been exceeded?

NO

- Continue at step 3.

3. Is the PSM-8E TX LED OFF?

YES

- If problems persists, contact TRANSITION Networks Technical Support.

NO

- Continue at step 4.

4. Is a network device down or unstable?

YES

- Is there one and only one host polling group per PSM-8E polling group?
- Does the host device type match the device?
- Has the host work station controller (WSC) capacity been exceeded?
- Is the device properly terminated using two 54.9 ohm resistors located between the "A" phase pin & earth ground and the "B" phase pin & earth ground? NOTE: Termination is provided by a "Y" or "T" cable assembly or by a terminating balun (i.e. ASFT series).
- Are there polarity reversals in the cable?
- Does the cable distance exceed the PSM-8E specification?
- Is the cable data grade?
- Does the wiring use natural pairs?
- Does the wiring avoid sources of environmental noise?
- Does the balun pinout match the PSM-8E 's pinout?
- Does the pinout/polarity of the host side balun match the pinout/polarity of the device side balun?

NO

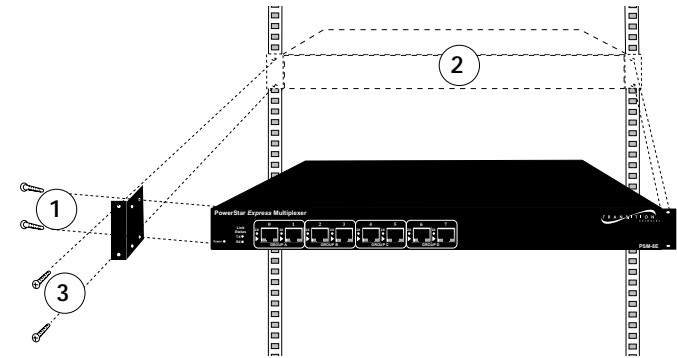
- Continue at step 5.

Install PSM-8E at Site

WARNING: During the site installation, handle the PSM-8E in such a way that the PSM-8E does not fall. Failure to observe this warning could result in injury to personnel and/or equipment damage.

NOTE: If PSM-8E is shipped with brackets installed, proceed to step 2.

To install the PSM-8E in 19-inch rack cabinet:

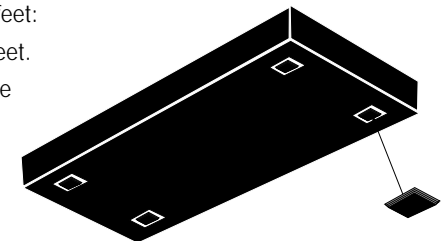


1. Remove and retain two (2) screws located at front left **side** and front right **side** of PSM-8E chassis. Install right and left front brackets (provided) on chassis by installing two (2) retained screws through each bracket into chassis.
2. Carefully align PSM-8E between 19-inch rack mounting rails.
3. Install PSM-8E by installing two (2) screws through right front bracket into rack and two (2) screws through left front bracket into rack, using clip nuts and nylon washers (NOT provided) to secure, if necessary.

To install the PSM-8E on table or other flat surface:

NOTE: Rubber feet are provided.

1. Carefully turn PSM-8E to side.
2. Install four (4) rubber feet:
 - Separate rubber feet.
 - Remove protective paper from adhesive surface on rubber foot.
 - Position and secure each rubber foot as shown.
3. Return PSM-8E to upright position.

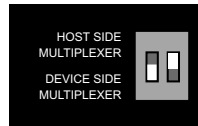


Connect Host PSM-8E

CAUTION: The eight RJ-45 connections at the front on the PSM-8E are divided into two polling groups of four connections each. Polling group #1 is the set of connections labeled A and B and numbered 0-3. Polling group #2 is the set of connections labeled C and D and numbered 4-7. Do not connect more than one 5250 protocol host polling group to a PSM-8E RJ-45 polling group. Failure to observe this caution will cause data transfer to fail.

1. Set configuration switch at back of one (1) host PSM-8E to host side multiplexer setting.

NOTE: Set associated point-to-point or ring mode switch in later step (page 8).



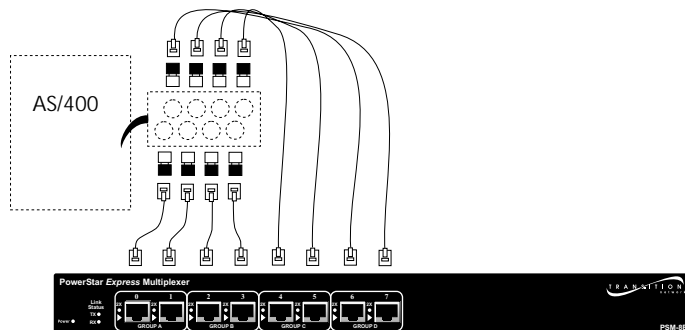
2. Referring to cable specifications on page 14 and to documentation specific to the AS/400, System 3x, or remote controller, locate or build appropriate cable for the AS/400, System 3x, or remote controller site installation.
3. Referring to documentation specific to the AS/400, System 3x, or remote controller and referring to the diagrams that follow, connect the AS/400, System 3x, or remote controller to the host PSM-8E.

AS/400

An AS/400 can be connected to the host PSM-8E either using either one or more of up to eight (8) shielded twisted-pair cables with RJ-45 connectors and appropriate baluns OR using a single shielded DB-25-to-DB-25 cable.

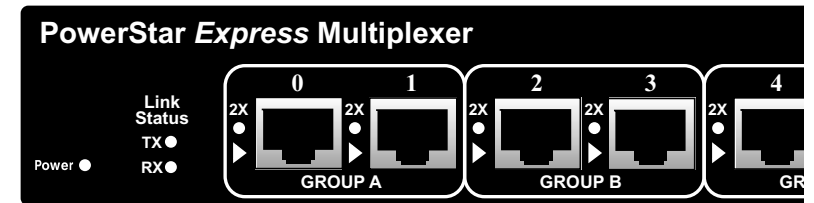
RJ-45 - At Front

At the front of the host PSM-8E, connect an AS/400 using an 8-port twinax "brick", appropriate baluns for the RJ-45 pin configuration, and twisted-pair copper cable with male RJ-45 connectors installed at both ends.



OPERATION

Use the status LEDs to monitor PSM-8E operation in the network.



PSM-8E INDICATORS

Power

Steady LED indicates PSM-8E is connected to external AC power.

(Link Status) TX

Flashing LED indicates, for each port, transmission of data packet(s) on fiber link.

(Link Status) RX

Flashing LED indicates, for each port, reception of data packet(s) on fiber link and synchronization of PSM-8E to signal.

RJ-45 INDICATORS

2X

Steady LED indicates, for each port, detection of 2 Mb/s *Express* mode signal.

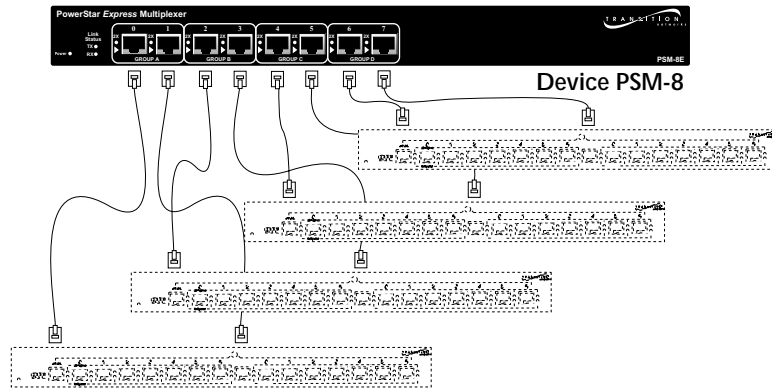
Dark LED indicates, for each port, detection of 1 Mb/s signal OR of system reset.



Flashing LED indicates, for each port, reception of data packet(s).

Connect PSM-8E to Terminal Devices

To connect cable from PSM-8E ports to terminal devices:

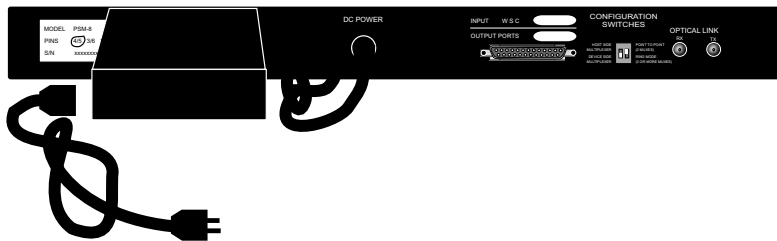


1. Locate or build 5250-compliant cables with male RJ-45 plug connectors at both ends. (See page 14.)
2. Connect male RJ-45 plug connector at one end of cable to PSM-8E RJ-45 jack connector.
3. Connect male RJ-45 plug connector at other end of cable to RJ-45 jack connector on network device.
4. Repeat steps 2-3 until all terminal devices are connected.

Power PSM-8E(s)

NOTE: When the PSM-8E is connected to an AC outlet supplying 90-250VAC at 50-60 Hz, the PSM-8E automatically powers ON

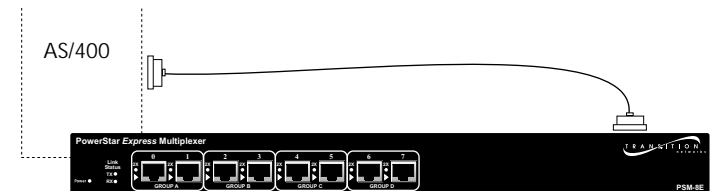
To power ON the PSM-8E:



1. Locate power receptacle located on external power supply installed at back of PSM-8E.
2. Plug unit (female) end of power cord into PSM-8E power receptacle.
3. Plug outlet (male) end of power cord into correct voltage AC wall socket.
4. Verify that LED on top of external power supply is illuminated.
5. At PSM-8E front, verify that **Power** LED is illuminated.

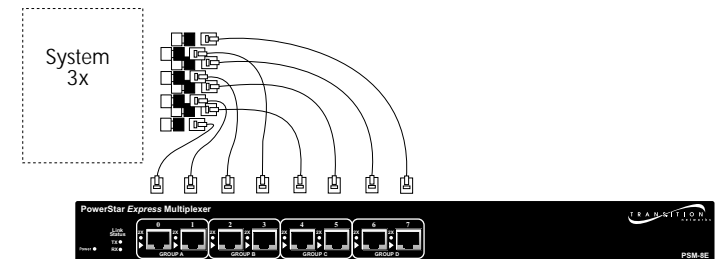
DB-25 - At Back

At the back of the host PSM-8E, connect an AS/400 to the host PSM-8E using a DB-25-to-DB-25 shielded twisted-pair cable.



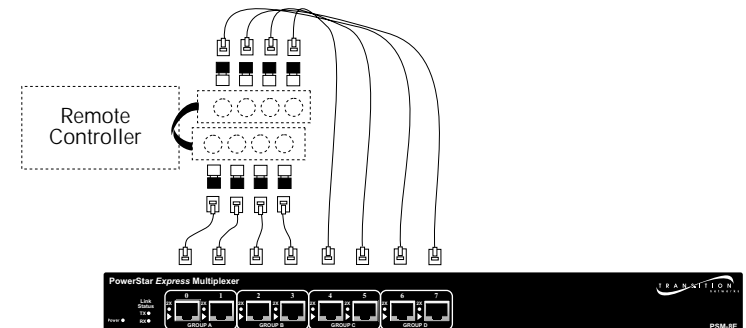
SYSTEM 3X

At the front of the host PSM-8E, connect a System 3x to the host PSM-8E using twisted-pair copper cable with male RJ-45 connectors installed at both ends and appropriate baluns for the RJ-45 pin configuration.



REMOTE CONTROLLER

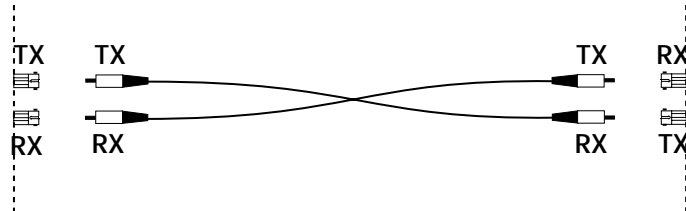
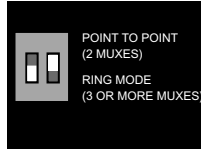
At the front of the host PSM-8E, connect a remote controller to the host PSM-8E using two 4-port twinax "bricks", twisted-pair copper cable with male RJ-45 connectors installed at both ends, and appropriate baluns for the RJ-45 pin configuration.



Connect Host PSM-8E to One or More Device PSM-8E(s)

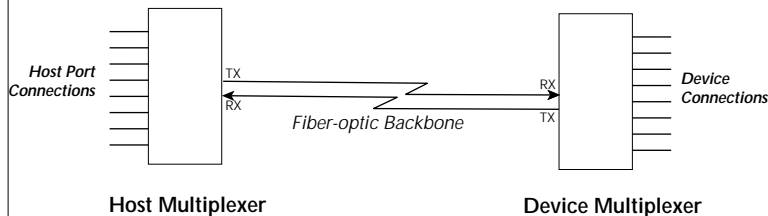
To connect fiber cable from host PSM-8E multiplexer to device PSM-8E multiplexer(s):

1. Referring to drawings on this page and to site requirements, determine configuration mode (*point-to-point*, *ring*, or *collapsed ring*) for network installation.
2. Set configuration switch at back of EACH AND EVERY PSM-8E IN NETWORK **EITHER** to point to point mode (UP - 2 multiplexer setting) **OR** to ring mode (DOWN - 3 or more multiplexer setting).
3. Locate or build 5250-compliant fiber cable(s) with male two-stranded TX to RX connectors at both ends. (See page 14.)
4. Connect male TX and RX cable connectors at one end of cable to TX and RX female connectors, respectively, on host PSM-8E.

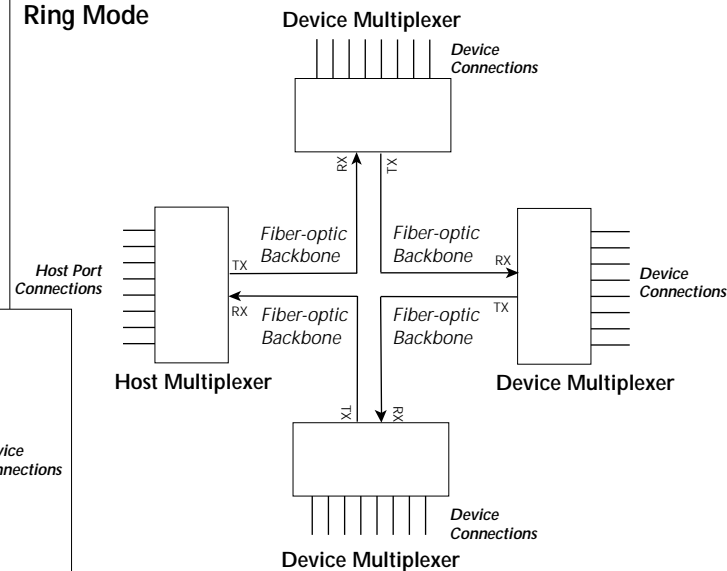


5. Referring to network configuration, connect male TX and RX cable connectors at other end of cable to RX and TX female connectors, respectively, on device PSM-8E(s) OR at fiber-optic patch panel.

Point-to-Point Mode



Ring Mode



Collapsed Ring Mode

