

8-Port Serial PCI ACC Multiplexer Installation and User's Guide

HP e3000 MPE/iX Computer Systems

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Multiplexer Overview

The Advanced Communications Controller (ACC) Subsystem is an intelligent serial communication product for HP e3000 Workstations and Servers. It provides a high performance Wide Area Network (WAN) platform for customers who have large synchronous and asynchronous networks. A complete HP ACC subsystem consists of both the multiplexer hardware and ACC software. This manual describes the 8-port PCI ACC Multiplexer hardware. This multiplexer is compatible with the Peripheral Component Interface (PCI) format. Refer to the manuals provided with your ACC software products for information on the ACC software.

Multiplexer Features

The major features of the HP multiplexer are:

- Serial communications at high speeds.
- Ideally suited for Wide Area Networks (WAN).
- Data rates configurable up to 128k baud on RS-232 and V.35 ports.
- Synchronous support.
- Support of the following telecommunications protocols:
 - LAPB
 - HDLC normal mode (SDLC)
 - HDLC-Level 1
- Level 1 support for RS-232 and V.35.
- Each port can be set to the following modes.
 - RS-232
 - V.35
 - Differential Loopback

8-Port PCI Multiplexer Maximum Baud Rates

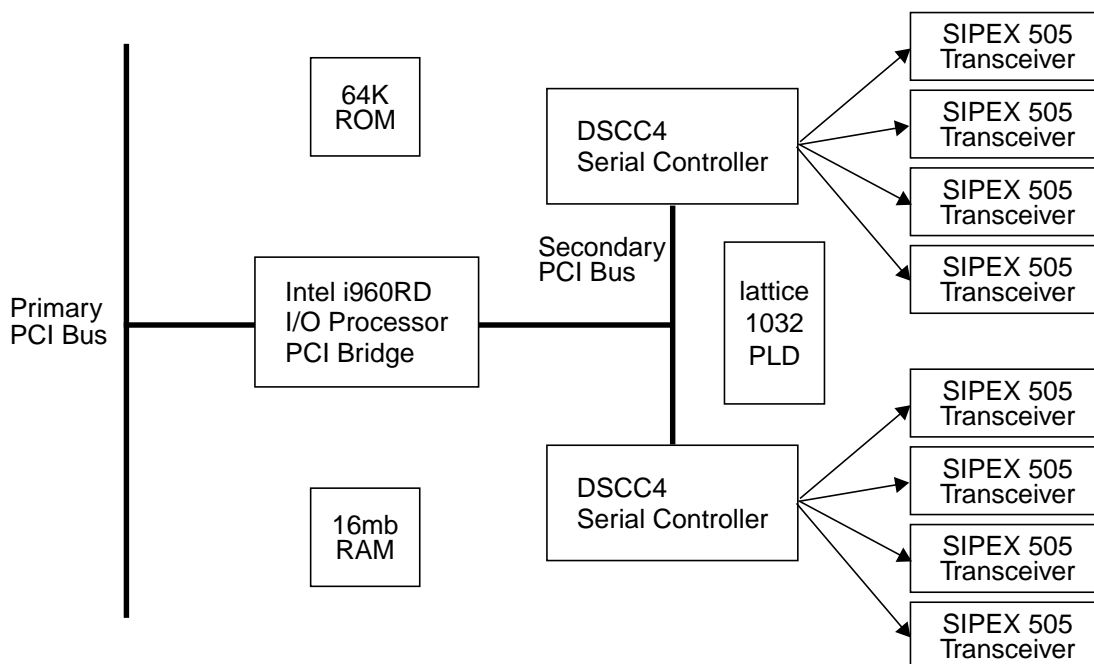
Although the ACC MUX card can handle rates above 19.2 Kbps for RS-232 and 64 Kbps for V.35, it is the customer's responsibility to ensure that the cable type and length are chosen appropriately.

Per Port	RS-232	128 Kbps
	V.35	128 kbps
Aggregate	RS-232	1024 Kbps
	V.35	1024 kbps

Multiplexer Architecture

The 8-port PCI ACC Multiplexer is an intelligent microprocessor-based interface that supports a wide variety of serial data communication protocols. The architecture allows the protocols to be implemented as downloaded modules which enhance the flexibility of the interface. The multiplexer has sufficient memory to provide data buffering and configuration tables, as well as space for multiple downloaded protocol modules. Figure 1-1 shows a functional block diagram of the multiplexer card.

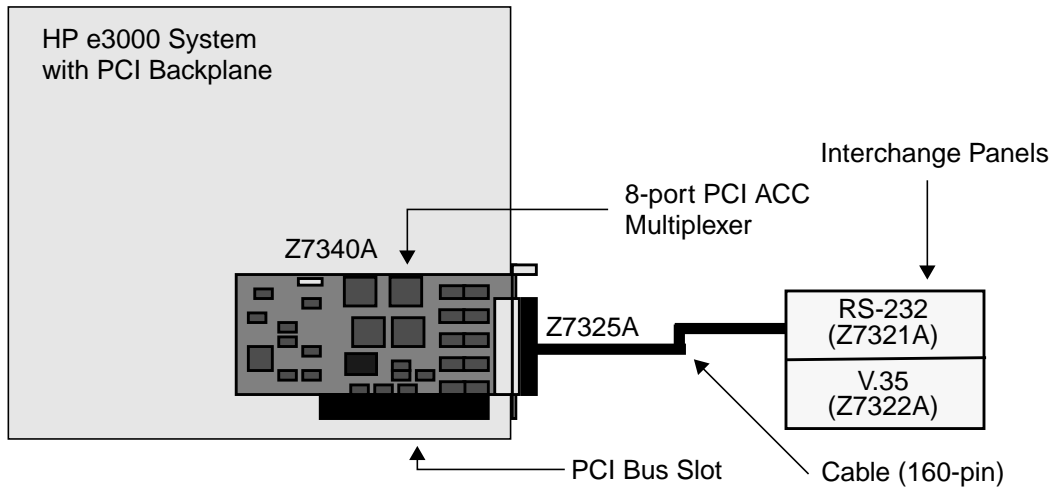
Figure 1-1 Block Diagram of the 8-Port PCI ACC Multiplexer



Multiplexer Hardware Requirements

The 8-port PCI ACC multiplexer consists of the major hardware components described in Figure 1-2 and shows the components and how they combine to provide the functionality of the ACC subsystem.

Figure 1-2 HP Z7340A 8-Port PCI ACC Card with Interchange Panels



NOTE Interchange panels and cables are not included with the Z7340A 8-port PCI ACC product. These must be ordered separately. Refer to the section on “Accessories” for a list of interchange panel and cable products.

Multiplexer

The multiplexer (or MUX) installs as an I/O interface card in the HP e3000 computer. The MUX is a one-half length PCI card, which supports eight synchronous or asynchronous ports at speeds up to 128 Kbps on RS-232 and V.35 ports.

Interchange Panel

An Interchange Panel acts as an intermediary between the MUX and the Packet Switching Network (PSN). Each individual interchange panel is designed for a specific serial communications standard, such as RS-232, and V.35 specifications.

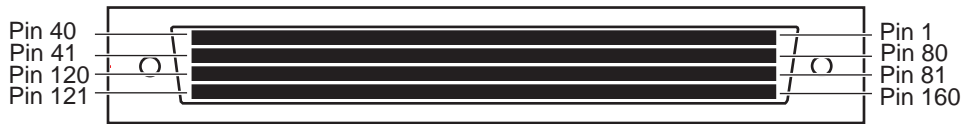
Rack Mounting Plate

A rack mounting plate allows up to two interchange panels to be mounted in the HP e3000 computer system’s rack. Panels can be mounted in any orientation.

HP Z7325A MUX/Interchange Panel Cable

The MUX connects to the interchange panel by a 160-conductor (28 AWG) cable, three meters (10.77 feet) in length. The cable has male connectors on each end, refer to Figure 1-3. The signals for each of the pins are listed in Appendix A , “Interchange Panels.”

Figure 1-3 HP Z7325A Cable Connector (Male)

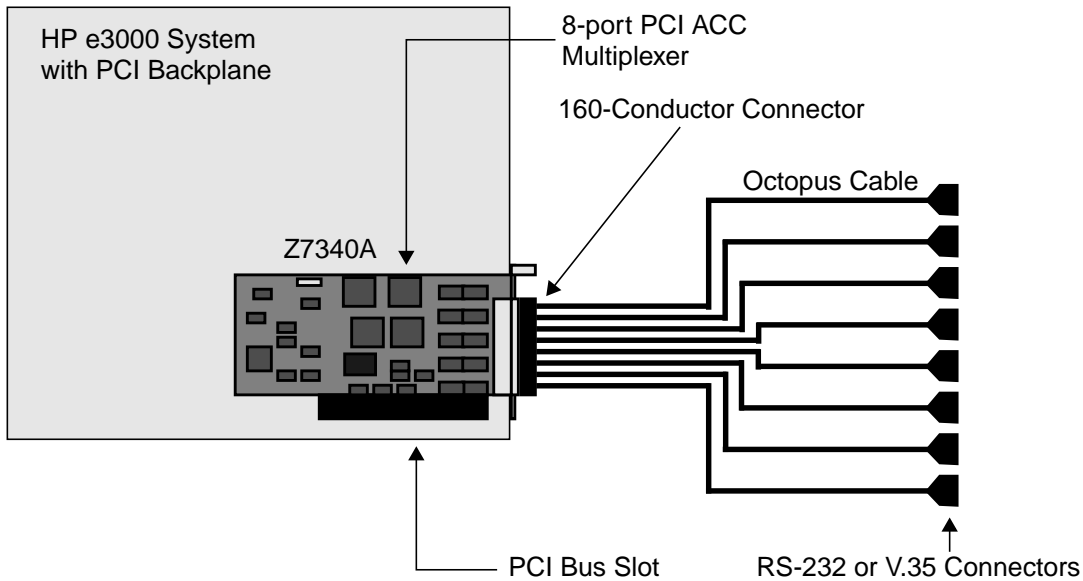


Octopus Cables

Two-meter octopus cables with a 160-conductor connector on one end and eight RS-232 or V.35 female connectors on the other end are also available for connecting the MUX and the Packet Switching Network. This cable replaces the 160-conductor cable and interchange panels for RS-232 or V.35 connections. Figure 1-4 shows the MUX card with an octopus cable.

NOTE The octopus cables do not support dual configuration (high-availability systems). You must use the 160-conductor cable and interchange panel to implement the dual configuration feature if you require an highly available system.

Figure 1-4 HP Z7340A 8-Port PCI ACC Card with Octopus Cable



Accessories

Table 1-1 lists the accessories available for the 8-port PCI ACC multiplexer.

Table 1-1 Accessories

Part Number	Description
Interchange Panels — Each interchange panel product includes the interchange panel, MUX/interchange panel cable, rack-mounting plate, and loopback test kit.	
Z7321A	RS-232 Interchange Panel for PCI ACC
Z7322A	V.35 Interchange Panel for PCI ACC
MUX/Interchange Panel Cable	
Z7325A	3-Meter, 160-Conductor Cable
Octopus Cables — Each octopus cable product includes the octopus cable and loopback test kit.	
Z7326A	2-Meter V.35 Octopus Cable
Z7327A	2-Meter RS-232 Octopus Cable
Loopback Cables	
Z7223-60002	RS-232 Loopback Cable
Z7363-63001	V.35 Loopback Cable
Rack Mounting Plate	
Z7340-00002	Rack Mounting Plate for Interchange Panels

Interchange Panels

Overview of the Interchange Panels

The Multiplexer is designed to connect to an interchange panel, which “breaks out” the signal into the ports. These panels are “passive” distribution panels, accepting the input from the MUX and distributing it to the network.

This section describes the various models of interchange panels that are compatible with the 8-port PCI ACC product. Each interchange panel is designed for a specific serial communications standard.

The following interchange panels that are compatible with the 8-port PCI ACC Multiplexer. Individual illustrations for each of the interchange panels appear later in this section.

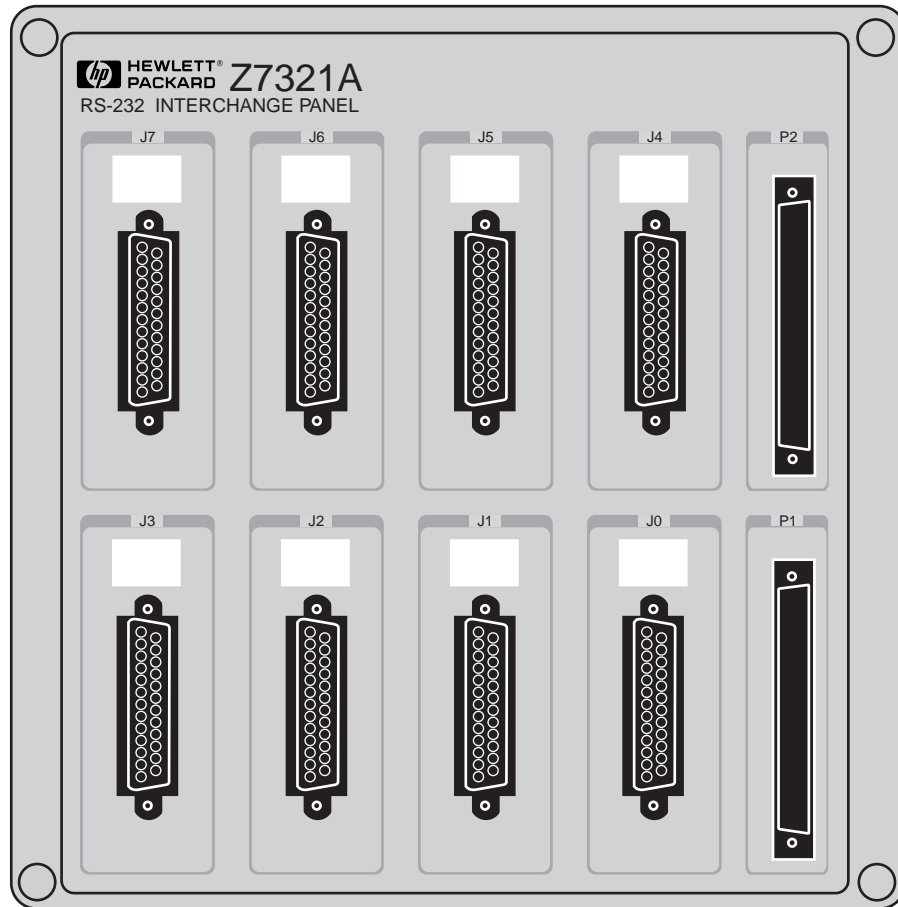
Z7321A RS-232 Interchange Panel, refer to Figure 1-5.

Z7322A V.35 Interchange Panel, refer to Figure 1-7.

RS-232 Interchange Panel

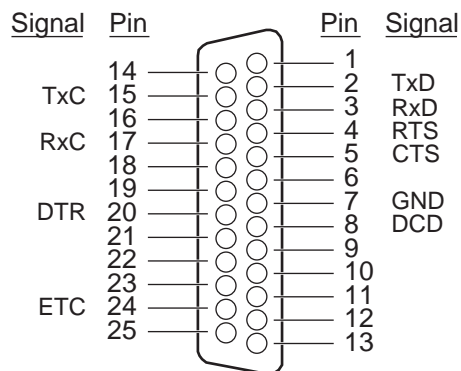
The RS-232 Interchange Panel is shown in Figure 1-5.

Figure 1-5 Z7321A RS-232 Interchange Panel



The signals supported on the RS-232 panels are in Figure 1-6.

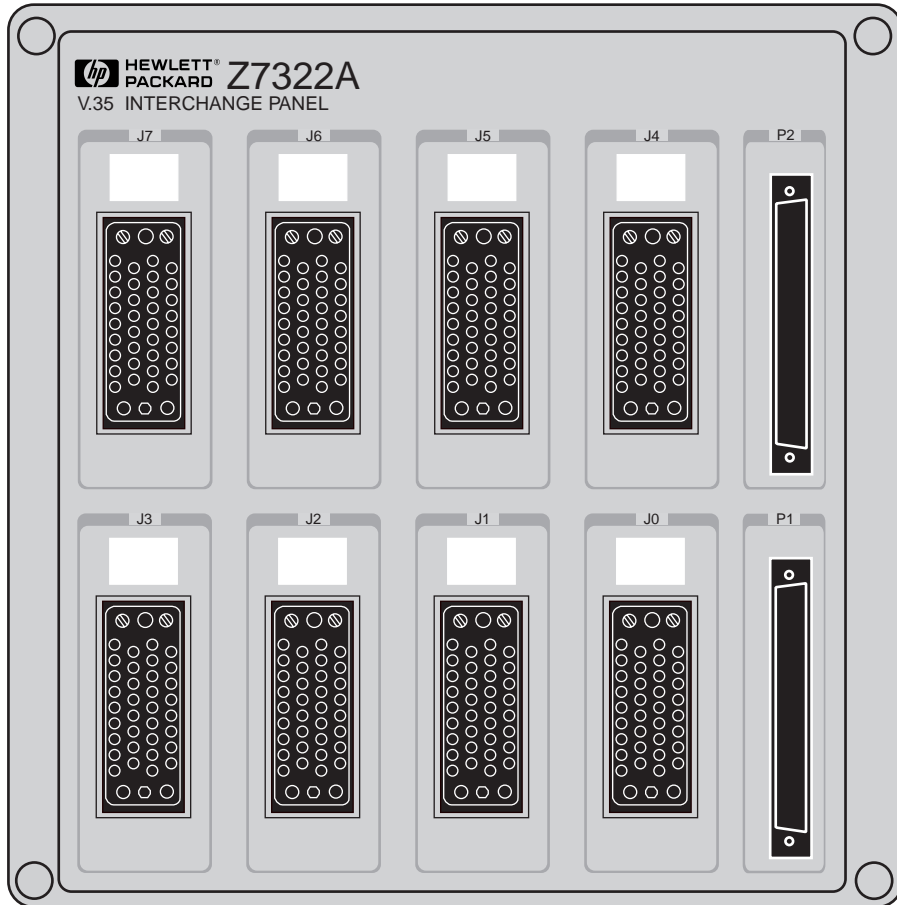
Figure 1-6 Supported RS-232 Signals (Panel Connectors)



V.35 Interchange Panel

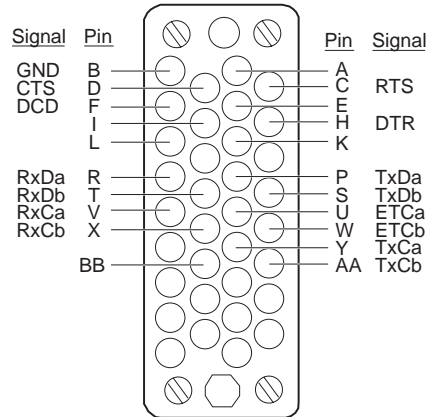
The V.35 Interchange Panel is shown in Figure 1-7.

Figure 1-7 **Z7322A V.35 Interchange Panel**



The signals supported on the V.35 panels are shown in Figure 1-8.

Figure 1-8 Supported V.35 Signals



This chapter describes how to install the 8-port PCI ACC Multiplexer and the interchange panel hardware for HP e3000 Workstations and Servers with a PCI backplane

Unpacking and Handling

If evidence of damage is observed when the carton containing the product is opened, inspect all items carefully, keep the shipping carton and packing material for the carrier's inspection.

If any item appears to be damaged, or if the product does not pass verification procedures described in this chapter, notify the nearest HP Sales and Support Office. Arrangements for the repair or replacement of the defective item(s) will be made without waiting for settlement of possible claims against the carrier.

Save the shipping carton and packing material after unpacking the product. These will be useful in the event that any item must be returned to Hewlett-Packard.

WARNING

Before installing the ACC Multiplexer, be sure to refer to the computer's manual that details the installation of accessories. To avoid severe personal injury, pay particular attention to Warnings and Cautions related to hazards exposed when opening covers in the computer. Because of the risk of electric shock or exposure to high-energy (high-amperage) circuits, some computers require that accessories be installed by persons qualified in the installation and servicing of computer equipment and who are trained to recognize the hazards involved.

Anti-Static Precautions

Follow these precautions to prevent damage to the multiplexer:

- Keep the card in or on its anti-static packaging until you install it, or use a static-free workstation.
- Use a grounding wrist strap when handling the interface card to channel static charges safely to ground.
- Avoid working on a carpet. Reduce unnecessary movements. These precautions will help prevent static buildup that might damage the card.
- Handle the card only by its non-connector edges or faceplate (bulkhead).
- Store interface cards and device adapters in their original shipping containers or equivalent anti-static packaging. The storage area should be clean, dry, and free of corrosive elements.
- After removing the card from the anti-static plastic bag, place it on a clean, anti-static work surface. (The bag is acceptable for this purpose if there is not a special work area set aside.)

Installing the 8-Port PCI ACC Multiplexer

The three major steps to installing the 8-Port PCI ACC Multiplexer are:

- Install the MUX card into the HP e3000 computer.
- Install the Interchange Panel(s) to the computer's rack.
- Cable the two together.

CAUTION

The interface cables should be secured to prevent strain to the I/O card connector and panel connectors. The cables are heavy and apply significant force on the connectors. Use appropriate cable management to relieve strain on the connectors.

Install the MUX Card into the HP e3000 Computer

1. Notify users of a shutdown and shut down the computer.
2. Turn off power switch and remove electrical power to the system.
3. Plug the printed circuit card into an available PCI slot, following the instructions for that HP e3000 computer (e.g., an "N" class server).

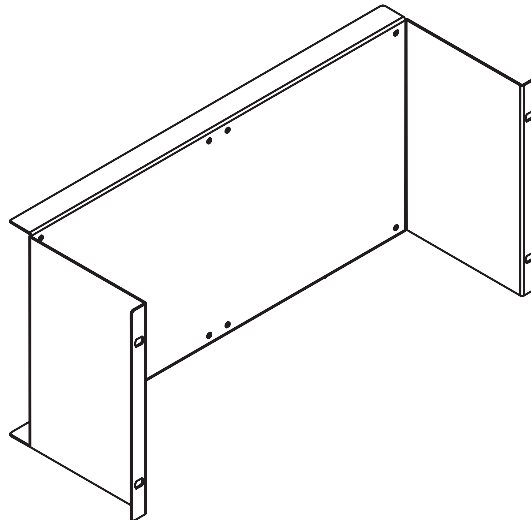
CAUTION

Be sure to observe the anti-static precautions while handling and installing the MUX card.

Install the Interchange Panel(s)

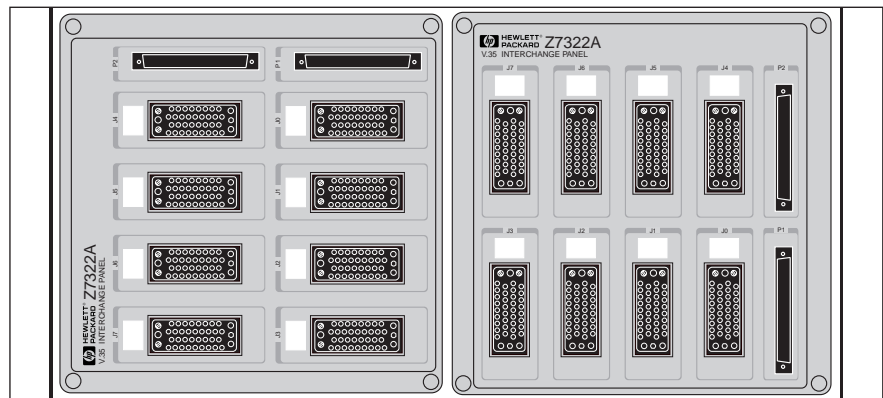
1. Place the rack mounting plate into the computer rack, so that the large holes on the sides of the plate are aligned with holes on the computer rack channels, refer to Figure 2-1.

Figure 2-1 Rack Mounting Plate



2. Attach the plate to the rack using appropriately-sized machine-metal screws for your rack.
3. Place one interchange panel against the back plane of the mounting plate. Mount it to the plate, using the M3x10 Torx screws provided with the plate.
4. To mount another interchange panel to this same plate, repeat the preceding step. Note that you can position the plate in a different direction from the first one, as shown in Figure 2-2.

Figure 2-2 Rack Mounting Plate In Use



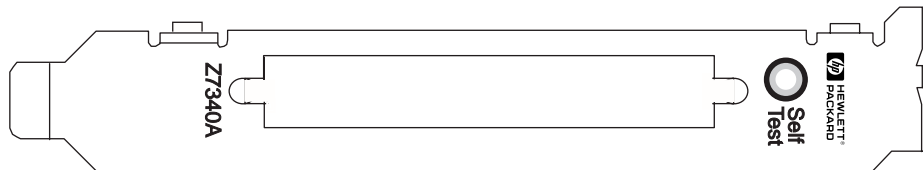
Connect the MUX to (one of) the Interchange Panel(s)

CAUTION

Before connecting the MUX card cable to the interchange panel, be sure that the power to the computer is off. Otherwise, serious equipment damage may occur.

1. Connect one end of the supplied cable to the connector on the MUX card and the other end to the interchange panel.
2. Apply power and reboot the computer.
3. After power is applied, check the Self Test LED indicator at the bulkhead of the MUX card, refer to Figure 2-3.

Figure 2-3 MUX Card Bulkhead with Self Test Indicator



The LED display is listed in Table 2-1.

Table 2-1 **MUX Card LED Display Interpretation**

LED Display	Meaning
LED flashes red for about seven seconds, then flashes green at two-second intervals.	This is normal. The MUX card has successfully passed self-test, but the firmware has not been downloaded.
LED turns green.	The firmware has been successfully downloaded.
LED turns red, flashes red at two-second intervals, flashes amber, or remains off.	There is a problem with the MUX card.
The LED turns orange.	At least one of the ports is down but the system can still be used. Run diagnostic software to determine the problem.

Replacing Interchange Panel(s)

The following procedure is used for replacing any of the Interchange Panels. Perform this procedure in the order given.

CAUTION

Before disconnecting and connecting MUX card cables to the interchange panel, be sure that the power to the computer is off. Otherwise, serious equipment damage may occur.

Remove the existing panel:

1. Disconnect the I/O cables from the MUX cards to which the panels are linked.
2. Disconnect the I/O cables from the panel to be replaced.
3. Remove the panel from the mounting plate (if mounted).

Install a new panel:

1. Mount the new panel onto the mounting plate.
2. Reconnect the I/O cables to the new panel.
3. Reconnect the other end of the I/O cables to the ACC MUX cards.

Storing the 8-Port PCI ACC Multiplexer

If this product is to be stored, use the original shipping container, or one of equivalent quality and size. Use anti-static containers for printed circuit assemblies. The storage area should be clean and dry, free of corrosive elements. Ensure that the product will not be dropped or crushed.

3 Configuration

Configuration of Clock Source Using NMMGR

Refer to Table 3-1 to configure the clock source parameter using NMMGR:

1. Direct Connect (2 ACC — connected back-to-back using loopback cable).
2. Connected to MODEM (or External DCE device).
3. Direct Connect (ACC and PSI connected back-to-back using loopback cable).

NOTE

Auto dial is not supported on ACC (outbound Dial is not supported, but inbound connections are supported). Configure **Modem Type** to 0 (which is leased or Direct Connect).

When the WAN port is externally connected to the DCE (like a modem) which provides an external clock, then configure **Clock source** as External.

When connecting ACC on one system to ACC on other systems using a loopback cable (Null Modem):

- **Clock source** in one system should be configured for 1 (External clocking) and another should be connected for 0 (internal clocking).
- When connecting ACC on one system to a PSI on a different system (using loopback cable), always configure **Clock source** on the ACC port to the internal clocking.
- **Local Mode** in one should be 6 (DCE) and another one must be 5 (DTE).

The configured clock of each port must match the corresponding end of the loopback cable. The end of the cable labeled internal goes to the side configured as internal clocking.

Table 3-1 Clock Source Configuration

	LOOPBACK Cable End	NMMGR Configuration Fields		
		Physical Interface	Clock Source	Local Mode
Direct Connect	External	0 (RS-232)	1 (External)	5 (DTE) or 6 (DCE)
	Internal	0 (RS-232)	0 (Internal)	6 (DCE) or 5 (DTE)
	External	1 (V.35)	1 (External)	5 (DTE) or 6 (DCE)
	Internal	1 (V.35)	0 (Internal)	6 (DCE) or 5 (DTE)
Connected to Modem	N/A	1 (V.35 or 0 (RS-232)	1 (External)	6 (DCE) or 5 (DTE)
Direct Connect	Internal	0 (RS-232)	0 (Internal)	6 (DCE) or 5 (DTE)
ACC/PSI	N/A	1 (V.35)	0 (Internal)	6 (DCE) or 5 (DTE)
Connected to Modem	N/A	1 (V.25) or 0 (RS-232)	1 (External)	6 (DCE) or 5 (DTE)
Notes:				
<ol style="list-style-type: none"> 1. The RS-232 loopback cables are asymmetrical and are labeled "Internal" on one end and "External" on the other end. The configured clock modes of each port must match the corresponding end of the loopback cable. 2. The V.35 loopback cables are symmetrical and may be connected either way round. One port of the pair should be configured for internal (Int) clock and the other to use the (Ext) clock mode. 				

A Interchange Panels

Interchange Panels, Signals and Pin Assignments

Table A-1 shows the Signal pin-out assignments for the interchange panels. All connectors on the interchange panels are female.

Table A-1 Pin Out Chart for Interchange Panels

Connectors P1, P2	ACC Signal	RS-232 Panel	V.35 Panel
1	TxDa (J0)	2	P
2	TxDb (J0)		S
3	RxDa (J0)	3	R
4	RxDb (J0)		T
5	RTSa (J0)	4	C
6	RTSb (J0)		
7	CTSa (J0)	5	D
8	CTSb (J0)		
9	DTRa (J0)	20	H
10	DTRb (J0)		
11	DCDa (J0)	8	F
12	DCDb (J0)		
13	ETCa (J0)	24	U
14	ETCb (J0)		W
15	RxCa (J0)	17	V
16	RxCb (J0)		X
17	TxCa (J0)	15	Y
18	TxCb (J0)		AA
19	SG (J0)	7	B
20	SG (J1)	7	B
21	TxDa (J1)	2	P

Table A-1 Pin Out Chart for Interchange Panels

Connectors P1, P2	ACC Signal	RS-232 Panel	V.35 Panel
22	TxD _b (J1)		S
23	RxD _a (J1)	3	R
24	RxD _b (J1)		T
25	RTS _a (J1)	4	C
26	RTS _b (J1)		
27	CTS _a (J1)	5	D
28	CTS _b (J1)		
29	DTR _a (J1)	20	H
30	DTR _b (J1)		
31	DCD _a (J1)	8	F
32	DCD _b (J1)		
33	ETC _a (J1)	24	U
34	ETC _b (J1)		W
35	RxC _a (J1)	17	V
36	RxC _b (J1)		X
37	TxC _a (J1)	15	Y
38	TxC _b (J1)		AA
39			
40	POD ID 0	GND	GND
41	TxD _a (J2)	2	P
42	TxD _b (J2)		S
43	RxD _a (J2)	3	R
44	RxD _b (J2)		T
45	RTS _a (J2)	4	C
46	RTS _b (J2)		
47	CTS _a (J2)	5	D
48	CTS _b (J2)		
49	DTR _a (J2)	20	H
50	DTR _b (J2)		
51	DCD _a (J2)	8	F

Table A-1 Pin Out Chart for Interchange Panels

Connectors P1, P2	ACC Signal	RS-232 Panel	V.35 Panel
52	DCDb (J2)		
53	ETCa (J2)	24	U
54	ETCb (J2)		W
55	RxCa (J2)	17	V
56	RxCb (J2)		X
57	TxCa (J2)	15	Y
58	TxCb (J2)		AA
59	SG (J2)	7	B
60	SG (J3)	7	B
61	TxDa (J3)	2	P
62	TxDb (J3)		S
63	RxDa (J3)	3	R
64	RxDb (J3)		T
65	RTSa (J3)	4	C
66	RTSb (J3)		
67	CTSa (J3)	5	D
68	CTSb (J3)		
69	DTRa (J3)	20	H
70	DTRb (J3)		
71	DCDa (J3)	8	F
72	DCDb (J3)		
73	ETCa (J3)	24	U
74	ETCb (J3)		W
75	RxCa (J3)	17	V
76	RxCb (J3)		X
77	TxCa (J3)	15	Y
78	TxCb (J3)		AA
79			
80	POD ID 1	GND	
81	TxDa (J4)	2	P

Table A-1 Pin Out Chart for Interchange Panels

Connectors P1, P2	ACC Signal	RS-232 Panel	V.35 Panel
82	TxD _b (J4)		S
83	RxD _a (J4)	3	R
84	RxD _b (J4)		T
85	RTS _a (J4)	4	C
86	RTS _b (J4)		
87	CTS _a (J4)	5	D
88	CTS _b (J4)		
89	DTR _a (J4)	20	H
90	DTR _b (J4)		
91	DCD _a (J4)	8	F
92	DCD _b (J4)		
93	ETC _a (J4)	24	U
94	ETC _b (J4)		W
95	RxC _a (J4)	17	V
96	RxC _b (J4)		X
97	TxC _a (J4)	15	Y
98	TxC _b (J4)		AA
99	SG (J4)	7	B
100	SG (J5)	7	B
101	TxD _a (J5)	2	P
102	TxD _b (J5)		S
103	RxD _a (J5)	3	R
104	RxD _b (J5)		T
105	RTS _a (J5)	4	C
106	RTS _b (J5)		
107	CTS _a (J5)	5	D
108	CTS _b (J5)		
109	DTR _a (J5)	20	H
110	DTR _b (J5)		
111	DCD _a (J5)	8	F

Table A-1 Pin Out Chart for Interchange Panels

Connectors P1, P2	ACC Signal	RS-232 Panel	V.35 Panel
112	DCDb (J5)		
113	ETCa (J5)	24	U
114	ETCb (J5)		W
115	RxCa (J5)	17	V
116	RxCb (J5)		X
117	TxCa (J5)	15	Y
118	TxCb (J5)		AA
119	DUAL OUT		
120	DUAL IN		
121	TxDa (J6)	2	P
122	TxDb (J6)		S
123	RxDa (J6)	3	R
124	RxDb (J6)		T
125	RTSa (J6)	4	C
126	RTSb (J6)		
127	CTSa (J6)	5	D
128	CTSb (J6)		
129	DTRa (J6)	20	H
130	DTRb (J6)		
131	DCDa (J6)	8	F
132	DCDb (J6)		
133	ETCa (J6)	24	U
134	ETCb (J6)		W
135	RxCa (J6)	17	V
136	RxCb (J6)		X
137	TxCa (J6)	15	Y
138	TxCb (J6)		AA
139	SG (J6)	7	B
140	SG (J7)	7	B
141	TxDa (J7)	2	P

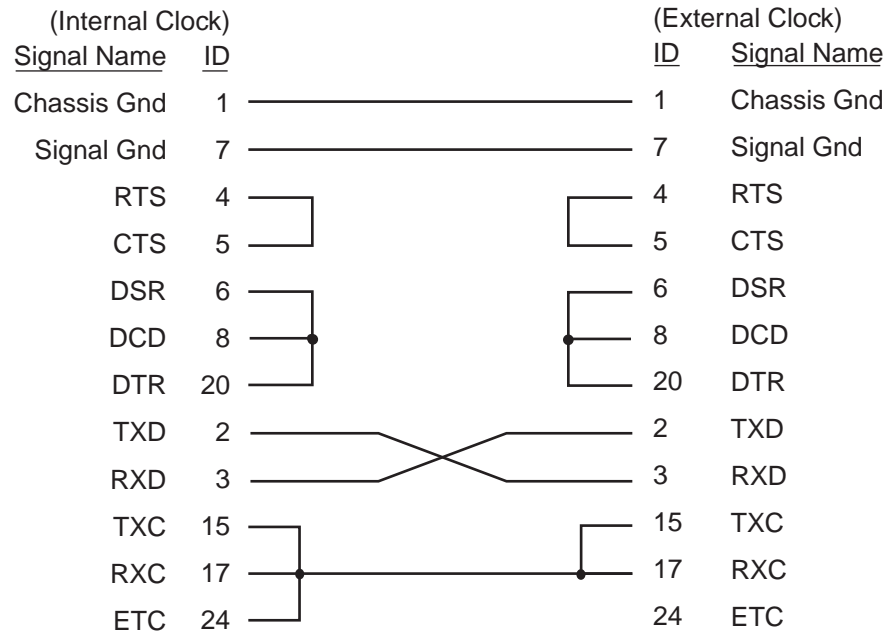
Table A-1 Pin Out Chart for Interchange Panels

Connectors P1, P2	ACC Signal	RS-232 Panel	V.35 Panel
142	TxD _b (J7)		S
143	RxD _a (J7)	3	R
144	RxD _b (J7)		T
145	RTS _a (J7)	4	C
146	RTS _b (J7)		
147	CTS _a (J7)	5	D
148	CTS _b (J7)		
149	DTR _a (J7)	20	H
150	DTR _b (J7)		
151	DCD _a (J7)	8	F
152	DCD _b (J7)		
153	ETC _a (J7)	24	U
154	ETC _b (J7)		W
155	RxC _a (J7)	17	V
156	RxC _b (J7)		X
157	TxC _a (J7)	15	Y
158	TxC _b (J7)		AA
159			
160	POD ID 2	GND	GND

RS-232 Loopback

The RS-232 loopback cable signals are shown in Figure A-1.

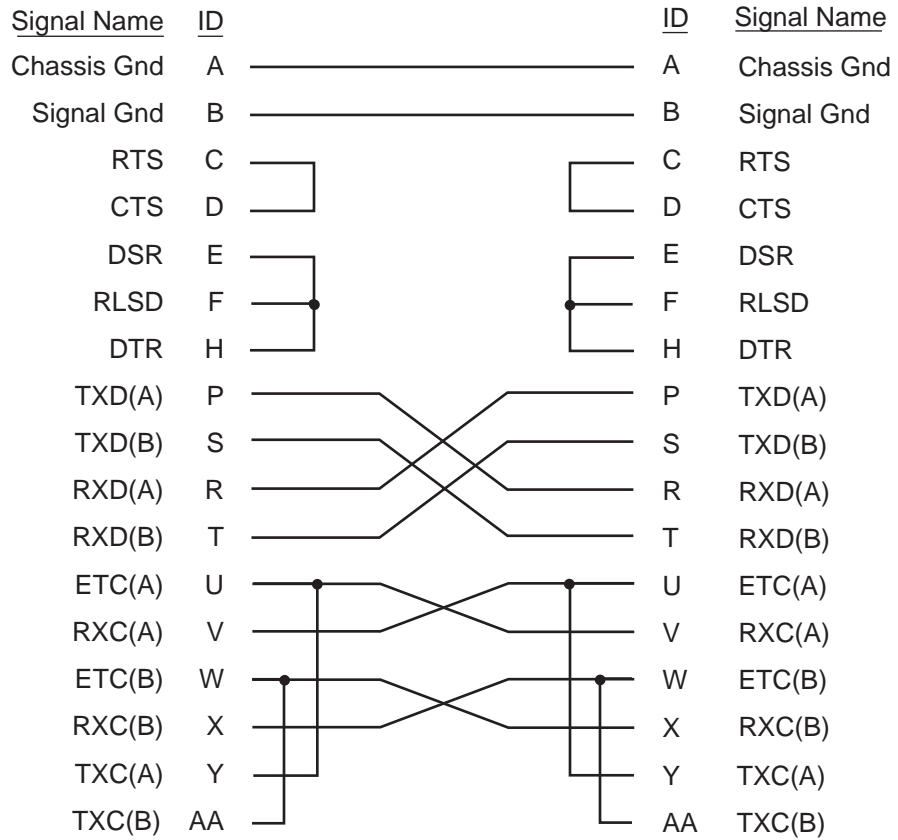
Figure A-1 RS-232 Loopback Cable Signals



V.35 Loopback

The V.35 loopback cable signals are shown in Figure A-2.

Figure A-2 V.35 Loopback Cable Signals



FCC EMI Statement (USA Only)

The Federal Communications Commission (in 47 CFR 15.105) has specified that the following notice be brought to the attention of the users of this product.

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.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Installing this card in an FCC Class B product results in an FCC Class A composite system as defined in the FCC Rules.

Cables used with this device must be properly shielded to comply with the requirements of the FCC Rules. Any changes or modifications to this equipment not expressly approved by the Hewlett-Packard Company may cause harmful interference and void the FCC authorization to operate this equipment.

The end user of this product should be aware that any changes or modifications made to this equipment without the approval of Hewlett-Packard could result in the product not meeting the Class A limits, in which case the FCC could void the user's authority to operate the equipment.

Industry Canada EMI Statement

This Class A digital apparatus complies with Industry Canada Standard ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 d'Industrie Canada.

Europe EMI Statement

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.

NOTE

Please see *Declaration of Conformity* statement on following page.

Telecommunications Europe



This marking is evidence of compliance with the EU Radio Equipment and Telecommunications Terminal Equipment Directive 1999/5/EC and other applicable EU Directives. This product conforms to ETSI TBR 1,2 for RS-232 and V.35 interfaces.

The Z7340A operates at SELV (Safety Extra Low Voltage) and, to assure safe and compliant operation, may connect to the telecommunication network only through an approved isolating device. The product is designed for use only with HP e3000 servers. Use with any other system may result in a hazard and thus invalidate regulatory approvals/conformance.

**DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN 45014**

Manufacturer's name: Hewlett-Packard Company

Manufacturer's address: 19420 Homestead Road Cupertino, California 95014, USA

declares that the product:

Product Name: PCI 8-Port ACC (Advanced Communications Controller)

Model Number(s): Z7340A

Product Options: PCI 8-Port Serial Card: Z7340A (HP P/N Z7340-68001) Interchange
Panels: Z7321A, Z7322A
Cables: Z7325A, Z7326A, Z7327A

conforms to the following Product Specifications:

Safety: IEC950:1991+ A1, A2, A3, A4 / EN 60950:1992 + A1,A2,A3,A4, A11
GB 4943-1995

EMC: CISPR 22:1993+A1, A2 / EN 55022:1994+A1, A2 Class A1 GB
9254-1988 CISPR 24:1997 / EN 55024:1998: ITE Immunity

Telecom: ETSI TBR 1,2

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC, the EMC Directive 89/336/EEC, and the R&TTE Directive 1999/5/EC (Annex II) and carries the CE-marking accordingly.

- 1) The Product was tested in a typical configuration with Hewlett-Packard information technology equipment.

Cupertino, CA, USA, April 8, 2000

Office of the Quality Manager

European Contact for regulatory topics only: Hewlett-Packard GmbH, Department
HQ-TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)