CP24 and CP24/B DISTRIBUTION PANEL

(RS-232-C COMPATIBLE)

TECHNICAL MANUAL

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1.1 INTRODUCTION

This manual contains installation and applications information for the CP24 and CP24/B Distribution Panels. It needs to be used only for setup, installation, and cabling of the distribution panel itself. Setup and installation instructions for any other components are included in the controller module technical manual that you received with your communications subsystem.

The contents of this manual are as follows:

Section 1 **General Description:** This section contains an overview of the CP24 Distribution Panel and CP24 specifications.

Section 2 **Preliminary Considerations:** This section contains information necessary to plan the installation.

Section 3 **Setup:** This section contains the information necessary to set up the CP24 and choose options.

Section 4 **Installation:** This section contains the information necessary to physically install the distribution panel.

1.2 OVERVIEW

The CP24 and CP24/B distribution panels are designed for use with DEC's Micro/PDP-11 and MicroVAX computers. The CP24 contains 16 nine-pin connectors and mounts directly in the patch panel of either a Micro/PDP-11 or MicroVAX. The CP24/B contains four 25-pin connectors that can be used in place of the first four connectors on the CP24. It is also designed to mount directly in the patch panel of a Micro/PDP-11 or MicroVAX.

The CP24 and CP24/B can be used with the Emulex products shown in Table 1-1.

Table 1-1. Emulex Products Used With the CP24

Product Name	Part Number
CS02/H1	CS0210201-H1

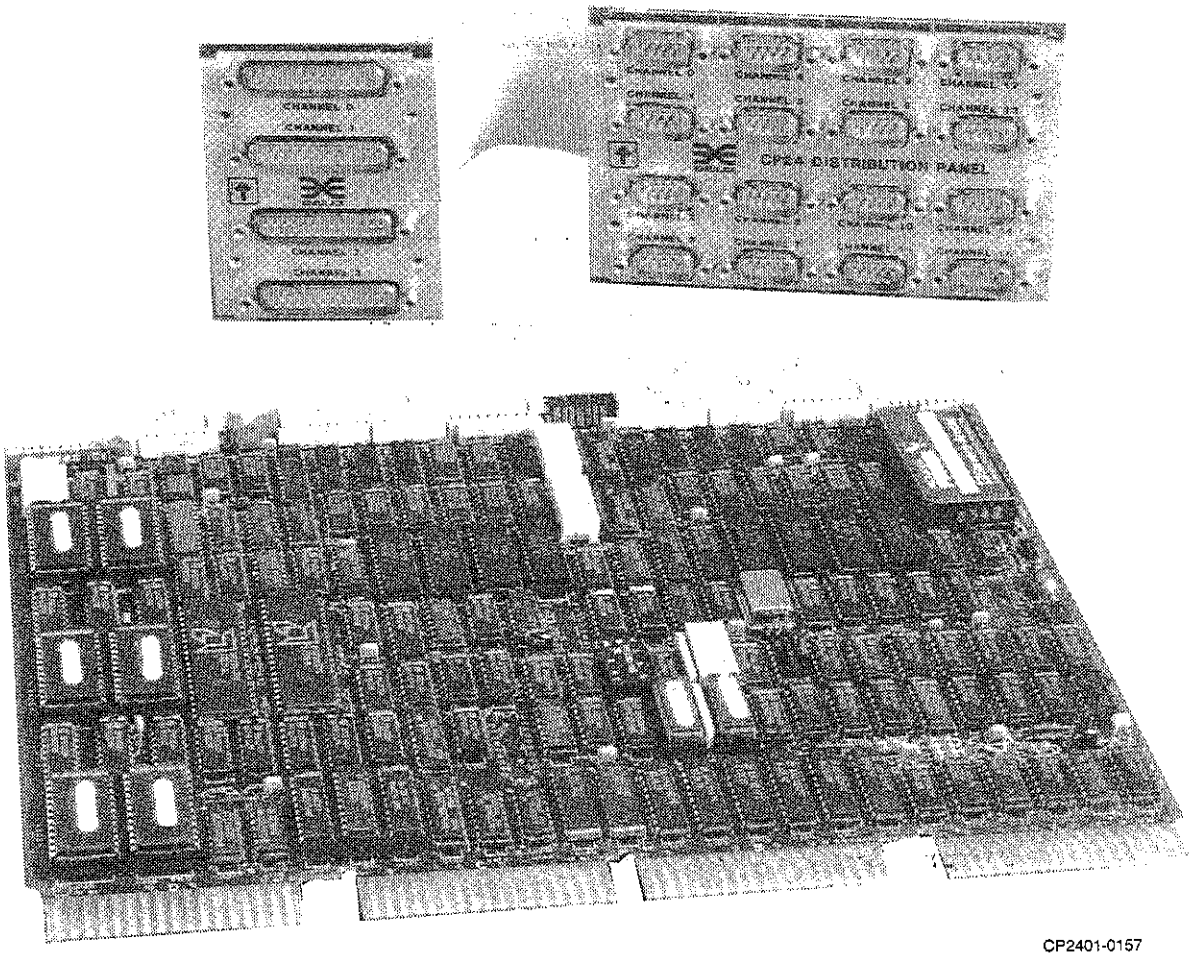

Figure 1-1. CP24 and CP24/B Distribution Panels with CS02 Controller

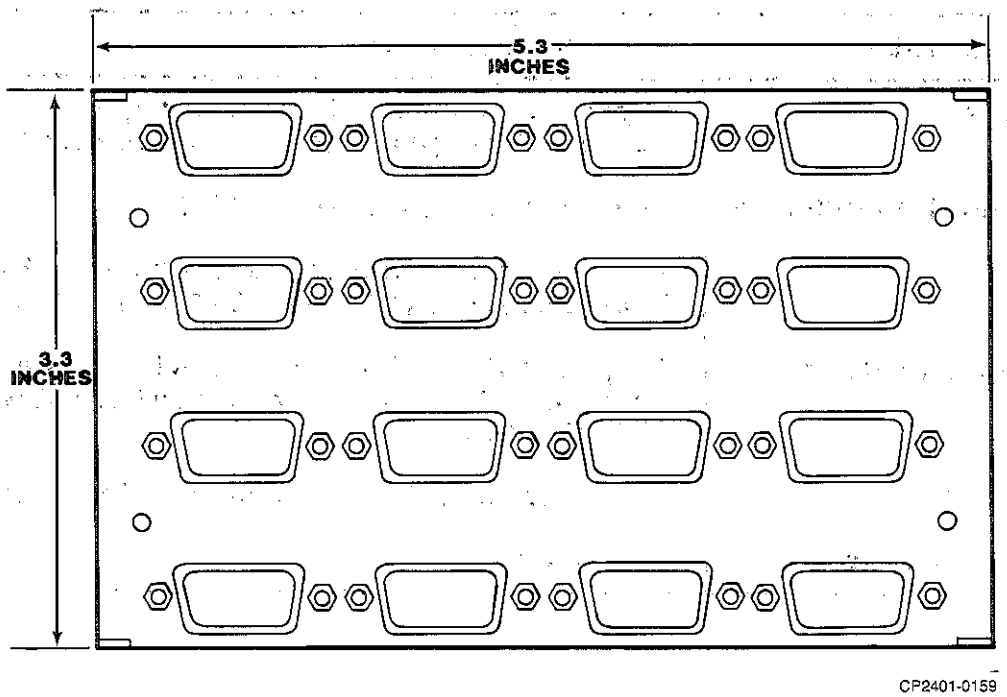

Figure 1-2. CP24 Distribution Panel Dimensions

Table 1-5. CP24/B Distribution Panel Specifications

Parameter	Description
Connectors	25-pin male subminiature D-type EIA RS-232-C
Operating Temperature	10°C (50°F) to 40°C (104°F) Maximum temperature is reduced 1.8°C per 1000 meters altitude (1°F per 1000 feet)
Relative Humidity	10 percent to 90 percent with a maximum wet bulb of 28°C (82°F) and minimum dewpoint of 2°C (3.6°F)
Dimensions	3.2 inches x 2.6 inches x 1.75 inches
Shipping Weight	1 pound

1.4 INTERFACE SPECIFICATIONS

Electrical signal levels conform to EIA RS-232-C specifications. Modem control signals are available on all 16 ports. Table 1-6 lists RS-232-C interface specifications for the CP24; Table 1-7 lists the RS-232-C interface specifications for the CP24/B. Table 1-8 lists the pin/signal assignments for the CP24; Table 1-9 lists the pin/signal assignments for the CP24/B.

Table 1-8. CP24 Pin/Signal Assignments

Pin #		Function
Pin 1	-	Chassis Ground
Pin 2	-	Ring
Pin 3	-	Transmit Data
Pin 4	-	Receive Data
Pin 6	-	Carrier Detect
Pin 7	-	Logic Ground
Pin 8	-	Receive Common*
Pin 9	-	Data Terminal Ready
*Channels 0-3 only		

Table 1-9. CP24/B Pin/Signal Assignments

Pin #		Function
Pin 1	-	Chassis Ground
Pin 2	-	Transmit Data
Pin 3	-	Receive Data
Pin 4	-	Request to Send
Pin 5	-	Clear to Send
Pin 6	-	Data Set Ready
Pin 7	-	Logic Ground
Pin 8	-	Carrier Detect
Pin 16	-	Receive Common*
Pin 20	-	Data Terminal Ready
Pin 22	-	Ring
*Channels 0-3 only		

2.1 OVERVIEW

This section describes some items that need to be considered before you configure and set up your communications subsystem. Including this overview, the section is divided into three main subsections:

Subsection	Title
2.1	Overview
2.2	Maintaining FCC Class A Compliance
2.3	RS-232-C Cable Lengths

2.2 MAINTAINING FCC CLASS A COMPLIANCE

The CP24 Distribution Panel has been tested with DEC computers that comply with FCC Class A limits for radiated and conducted interference. The CP24 is FCC compliant and is designed to be installed in the same cabinet as the controller. This method of installation is described in Section 4. The CP24 and CP24/B must be installed as described in Section 4 in order to maintain FCC Class A compliance.

2.3 RS-232-C CABLE LENGTHS

The EIA RS-232-C interface standard guarantees error-free transmission over cables no longer than 50 feet. Because the line drivers are on the controller module, this length includes the cable between the controller and the CP24. **Emulex does not guarantee operation over cable lengths greater than 50 feet in any circumstances.** However, satisfactory performance over cables several thousand feet in length can be obtained, depending on the speed of data transmission required and the environment in which the cable is placed. Table 2-1 is a guide to the practical application of RS-232-C cable lengths.

NOTE

The ground potential difference between the controller and terminal must not exceed 2 volts. This requirement generally limits operation without modems to a single building served by one AC power service.

3.1 OVERVIEW

This section describes how to configure and set up the CP24 and CP24/B Distribution Panels. Including this overview, the section is divided into three main subsections:

Subsection	Title
3.1	Overview
3.2	CP24 Distribution Panel Setup
3.3	CP24/B Distribution Panel Setup

3.2 CP24 DISTRIBUTION PANEL SETUP

3.2.1 GROUNDING OPTIONS

Each channel on the CP24 has a set of jumpers C-D and E-F, which control the distribution panel grounding. Table 3-1 lists the jumpers and their functions. Figure 3-1 illustrates the grounding options.

Table 3-1. CP24 Grounding Options

Jumper	Factory	Function
C to D	Connection in etch	When etch cut in conjunction with cut between E-F, protective ground isolated from chassis ground.
E to F	Connection in etch	When etch cut, signal from Pin 1 passes through 1/2 watt, 100-ohm resistor prior to chassis ground.

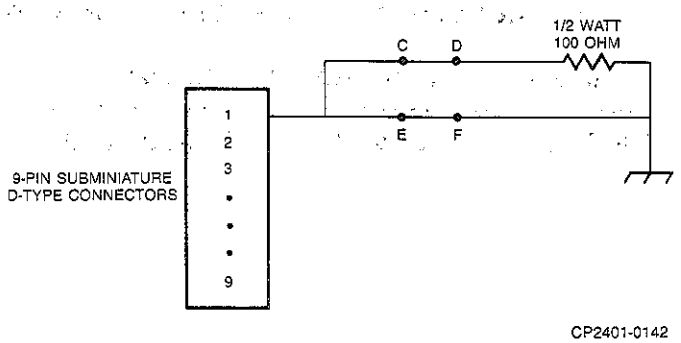

Figure 3-1. CP24 Grounding Options

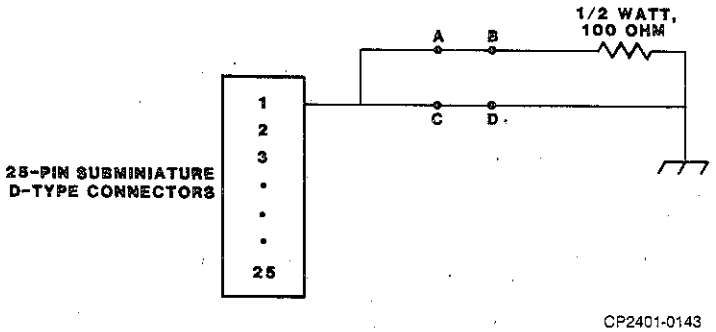

Figure 3-3. CP24/B Grounding Options

3.3 CP24/B DISTRIBUTION PANEL SETUP

3.3.1 GROUNDING OPTIONS

Each channel on the CP24 has a set of jumpers A-B and C-D, which control the distribution panel grounding. Table 3-2 lists the jumpers and their functions. Figure 3-3 illustrates the grounding options.

Table 3-2. CP24/B Grounding Options

Jumper	Factory	Function
A to B	Connection in etch	When etch cut in conjunction with cut between E-F, protective ground isolated from chassis ground.
C to D	Connection in etch	When etch cut, signal from Pin 1 passes through 1/2 watt, 100 ohm resistor prior to chassis ground.

3.3.2 CONFIGURING THE CP24/B FOR RS-423-A

Any channel on the CP24/B may be individually reconfigured for RS-423-A operation. To configure a channel for RS-423-A, you must cut an etch on the CP24 panel (**not** on the CP24/B). To configure a channel on the CP24/B for RS-423 operation, cut the etch between jumper pads A-B on the corresponding channel on the CP24. Once this etch has been cut, the connections between jumpers A and B must be hardwired to return the channel to an RS-232-C interface. Figure 3-4 illustrates the jumper connections and the RS-423-A cabling.

Jumper	Installed	Removed	Factory
A-B (on CP24)	RS-232	RS-423	Installed

4.1 OVERVIEW

This section describes how to mount and cable the CP24 and CP24/B Distribution Panels. Including this overview, the section is divided into four main subsections:

Subsection	Title
4.1	Overview
4.2	CP24 Distribution Panel Mounting
4.3	Cabling the CP24 to the Controller Module
4.4	Attaching External Devices to the CP24 Distribution Panel

4.2 CP24 DISTRIBUTION PANEL MOUNTING

The CP24 Distribution Panel is designed to be mounted in the patch and filter panel of a Micro/PDP-11 or MicroVAX. If you are also using the CP24/B, it is mounted directly next to the CP24 in the patch panel. The following steps explain how to mount the CP24 and CP24/B.

1. If you have not already done so, remove the captive screws that hold the patch and filter panel assembly to the rear of the Micro/PDP-11 or MicroVAX. Lift the panel slightly and pull it out, leaving the cables connected.

2. Using a Phillips-head screwdriver, remove the blank panels labeled C and D (see Figure 4-1). On the opposite side of the patch and filter panel, remove the screw that holds the divider between panels C and D in place. Put the screws aside; they will be used later.

3. Position the CP24 Distribution Panel in the aperture where the blank panels were located, by placing the face of the CP24 Distribution Panel against the back of the patch and filter panel. The arrow enclosed in a square should be oriented in the same direction as the arrows printed on the patch and filter panel. The subminiature D-type connectors should show through the aperture. Figure 4-2 depicts the mounting of the CP24 and CP24/B Distribution Panels into the patch and filter panel assembly.

4. Insert the screws (which held the blank panels in place) through the four clearance holes into the self-clinching fasteners on the CP24 Distribution Panel.

If the CP24/B Distribution Panel is used, continue with Step 5. Otherwise, skip to Step 8.

5. Using a Phillips-head screwdriver, remove the panel located next to the label B. Put the screws aside; they will be used later.

6. Position the CP24/B Distribution Panel in the aperture where the panel was located, by placing the face of the CP24/B Distribution Panel against the rear of the patch and filter panel. The arrow enclosed in a square should be oriented in the same direction as the arrows printed on the patch and filter panel. The subminiature D-type connectors should show through the aperture.

7. Insert screws (which held the removed panel in place) through the four clearance holes into the self-clinching fasteners on the CP24/B Distribution Panel.

8. Installation of the distribution panels is now complete. The next section describes how to cable the panels to the controller module.

4.3 CABLING THE CP24 TO THE CONTROLLER MODULE

Two 50-pin cables are needed to connect the CP24 to the controller. If the CP24/B is also used, a 34-pin cable connects the CP24/B to the CP24, and a 16-pin cable connects the CP24/B to the controller.

The following steps explain how to cable the CP24 and CP24/B to the controller. Figure 4-3 illustrates the cabling requirements.

1. Find the arrow at either end of one of the 50-pin cables. The arrow identifies pin 1 of the cable header.

2. Find the corresponding arrow on CP24 connector J1.

3. Align the arrow on the cable header with the arrow on connector J1 and plug the cable connector into J1.

4. With one end of the cable plugged into connector J1 of the CP24, find the arrow on the cable header at the other end of the cable. Align this arrow with the corresponding arrow on connector J2 of the controller, and plug the connectors together.

4.4.1 MODEMS

Modems require cables that can carry the modem control signals. Figures 4-4 and 4-5 show diagrams of modem cables for the CP24 and CP24/B respectively.

4.4.2 TERMINALS AND PRINTERS

Devices such as terminals and printers which do not require modem control signals for flow control can be connected to a CP24 port using a simple four-wire cable called a terminal cable. Figures 4-6 and 4-7 show schematics of terminal cables for the CP24 and CP24/B respectively.

The controller module hardware cannot distinguish between ports that are not connected to modems and ports that are. Thus, the host operating system must be configured for modem or modemless operation on a line-by-line basis. If this is impractical because modems are constantly being moved from one line to another, then the host can be configured for modems on all lines. However, in such cases, the four-wire cable described for local devices will not work, because the software will expect to receive modem control signals and will not transmit data until the proper signals are received.

Nearly all terminals keep DTR and RTS asserted at all times, and a null-modem cable uses these constant signals to drive various inputs on the CP24. This gives the illusion that a modem has generated these signals, so the software can transmit at any time. Figure 4-8 shows a null-modem cable for full-duplex operation (CP24 only). Figure 4-9 shows a null-modem cable for use on channels configured for half-duplex operation (CP24/B only). A null-modem cable must be used whenever a device that is normally in the non-modem class is connected to a channel that has been configured for modem operation.

4.4.3 USING THE RS-423-A OPTION

As shipped from the factory, all channels on the CP24 and CP24/B are compatible with the industry standard RS-232-C interface. However, Channels 0 through 3 can be reconfigured as an RS-423-A interface (as described in subsections 3.2.2 and 3.3.2).

RS-423-A interface circuits transmit reliably over longer distances than RS-232-C circuits. Of course, the benefits of RS-423-A cannot be achieved unless **both ends** of the cable are RS-423-A. This means that either your terminal must have RS-423-A interface circuits or you must use an RS-422 converter, such as Emulex's CV422, on the terminal end of the cable. Figure 3-2 shows the necessary RS-423-A cabling information. Use twisted-pair cable, where one conductor of the pair is the signal ground of the transmitter for each direction.

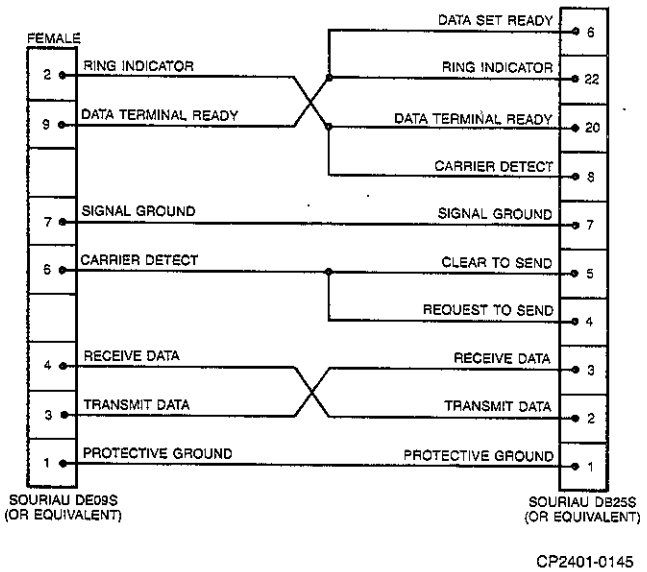

Figure 4-8. Full-Duplex Null-Modem Cable (CP24)

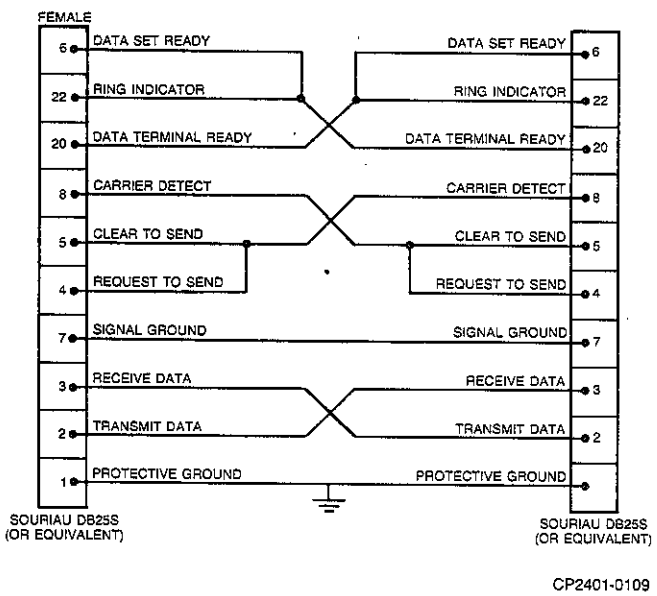

Figure 4-9. Half-Duplex Null-Modem Cable (CP24/B)

EMULEX CORPORATION
DOCUMENTATION SHIPPING KIT LIST

CP24 DISTRIBUTION PANEL

The following documents make up the documentation package for the :

Qty	Part Number	Revision Level	Description
1	CP2451001	A	CP24 Technical Manual
1	AD0043	--	Wrap-around Connector Addendum

EMULEX

PUBLICATION ADDENDUM

NO.	DATE:
AD0043	08 Jul 86
PAGE: 1	OF 2

PUBLICATION NUMBER	PUBLICATION TITLE	REV	EFFECTIVE DATE
CP--510--	Distribution Panel		Immediately
	Technical Manuals		

REASON

The wrap-around connector has been deleted from all of the parts lists for all of the distribution panels. References to these connectors should be deleted from distribution panel manuals, communications controller manuals. and communications diagnostics manuals. These connectors may still be purchased from Emulex, but are not shipped automatically with orders of other products.

Example from the CP32 Technical Manual:

Table 1-2. Cables and Mounting Hardware

Item	Part Number	Description
	. . . . .	
8.	CU3210201	Wrap-around connector

The above connector and all equivalent wrap-around connectors should be deleted from the distribution panels parts lists. A list of the affected connectors follows on the next page.

ORIGINATOR	ENGINEERING SERVICES	ENGINEERING	PUBLICATIONS
J. Sutherland	B. Pfiffer	Bruce Morin	

EF059A(10/83)