# EMERSON
## Network Power

# MVME7616E Transition Module

## Installation and Use

**6806800A43B**

August 2008

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# Contents

**Contents**

# List of Tables

# *List of Figures*

# *About this Manual*

## Overview of Contents

This manual is divided into the following chapters and appendices:

*MVME7616E Transition Module Installation and Use* provides general information, hardware preparation, installation instructions and support information for the MVME7616E-001 and MVME7616E-011 Transition Modules. These transition modules are used as the interface between the variants of the MVME51005E and MVME55006E Single Board Computers. A P2 adapter module and cable are supplied with the MVME7616E. The MVME7616E will hereafter be referred to as the MVME761.

As of the printing date of this manual, these I/O module models are available:

| Model Number | Description |
|---|---|
| MVME7616E-001<br>MVME7616E-011 | 3-Row Rear Transition Module and P2 Adaptor<br>5-Row Rear Transition Module and P2 Adaptor |
| MVME761P26E-001<br>MVME761P2-6E011 | 3-Row, P2 Adapter Module Only<br>5-Row, P2 Adapter Module Only |
| Related Product | |
| MVME51005E<br>MVME51105E | MVME Series MVME51005E Single Board Computer |
| MVME55006E | MVME Series MVME55006E Single Board Computer |
| IPMC7616E-001<br>IPMC7616E-002 | Multifunction rear I/O PMC module; Ultra-Wide SCSI, one parallel port, three asynchronous and one synchronous/asynchronous serial port |
| SIM232DCE5E<br>SIM232DTE5E | EIA232-DCE serial interface module<br>EIA232-DTE serial interface module |

# Abbreviations

This document uses the following abbreviations:

| Abbreviation | Description |
|---|---|
| AC | Alternating Current |
| CFM | Cubic Feet per Minute |
| D/C | Direct Current |
| DCE | Data Communications Equipment |
| DIN | Deutsches Insitut für Normung eV |
| DTE | Data Terminal Equipment |
| EMI | Electro-Magnetic Interference |
| ESD | Electro-Static Discharge |
| FCC | Federal Communications Commission |
| GND | Ground |
| I/O | Input/Output |
| IC | Integrated Circuit |
| IEEE | Institute of Electrical and Electronics Engineers |
| PMC | PCI Mezzanine Card |
| RF | Radio Frequency |
| RTM | Rear Transition Module |
| SCSI | Small Computer System Interface |
| SIM | Serial Interface Module |
| VME | Versamodule Eurocard |

# Conventions

The following table describes the conventions used throughout this manual.

| Notation | Description |
|---|---|
| 0x00000000 | Typical notation for hexadecimal numbers (digits are 0 through F), for example used for addresses and offsets |
| 0b0000 | Same for binary numbers (digits are 0 and 1) |
| **bold** | Used to emphasize a word |
| Screen | Used for on-screen output and code related elements or commands in body text |
| **Courier + Bold** | Used to characterize user input and to separate it from system output |
| *Reference* | Used for references and for table and figure descriptions |

| Notation | Description |
|---|---|
| File > Exit | Notation for selecting a submenu |
| <text> | Notation for variables and keys |
| [text] | Notation for software buttons to click on the screen and parameter description |
| ... | Repeated item for example node 1, node 2, ..., node 12 |
| . . . | Omission of information from example/command that is not necessary at the time being |
| .. | Ranges, for example: 0..4 means one of the integers 0,1,2,3, and 4 (used in registers) |
| \| | Logical OR |
| ⚠ WARNING | Indicates a hazardous situation which, if not avoided, could result in death or serious injury |
| ⚠ CAUTION | Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury |
| NOTICE | Indicates a property damage message |
| 💡 | No danger encountered. Pay attention to important information |

# Summary of Changes

This manual has been revised and replaces all prior editions.

| Part Number | Publication Date | Description |
|---|---|---|
| 6806800A43A | June 2006 | First edition |
| 6806800A43B | August 2008 | Updated to Emerson style. |

# Comments and Suggestions

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# *General Information*

<div style="text-align: right">**1**</div>

## 1.1    Overview

This manual provides general information, hardware preparation, installation instructions, and a functional description for the MVME761-001 and MVME761-011 Transition Modules.

The MVME761-0x1Transition Module provides the interface between the MVME5100 or MVME5500

Single Board Computer VMEmodules and various peripheral devices. This module provides industry standard connectors to simplify customer cable requirements for the serial port, printer, and Ethernet signals.

## 1.2    Features

The features of the MVME761-0x1 Transition Module include:

- Industry-standard connectors for these interfaces:
    - Two EIA-574 asynchronous serial ports (DTE)
    - Two asynchronous/synchronous serial ports, configured for EIA-232-D (DCE or DTE)
    - One parallel port (IEEE Standard 1284-I compliant)
    - 10Base-T/100Base-TX Ethernet
- Two 60-pin Serial Interface Module (SIM) connectors for configuring the asynchronous/synchronous serial ports
- Single-width board
- Electro-Magnetic Interference (EMI) and Electro-Static Discharge (ESD) protection

## 1.3    General Description

The MVME761-0x1 Transition Module provides the interface between the standard Ethernet, parallel port, and the serial port connectors on a variety of single board computers. All port I/O controllers reside on the host VMEmodules. The MVME761 transition module Ethernet and parallel port circuitry is passive. The serial port circuitry provides multiplexing and buffering functions (refer to *P2 Signal Multiplexing (P2MX)* on page 27). The multiplexing function is transparent to the user.

Both MVME761-0x1 models use the same transition module. The MVME761-001 comes with a P2 adapter that connects to a 3-row DIN chassis backplane. The MVME761-011 comes with a P2 adapter that connects to a 5-row DIN chassis backplane.

Figure 1-1 shows the MVME761 transition module component layout and the front panel. See Table 1-2 for a list of the front panel port connectors.

*Figure 1-1    RTM Front Panel and Components Side*
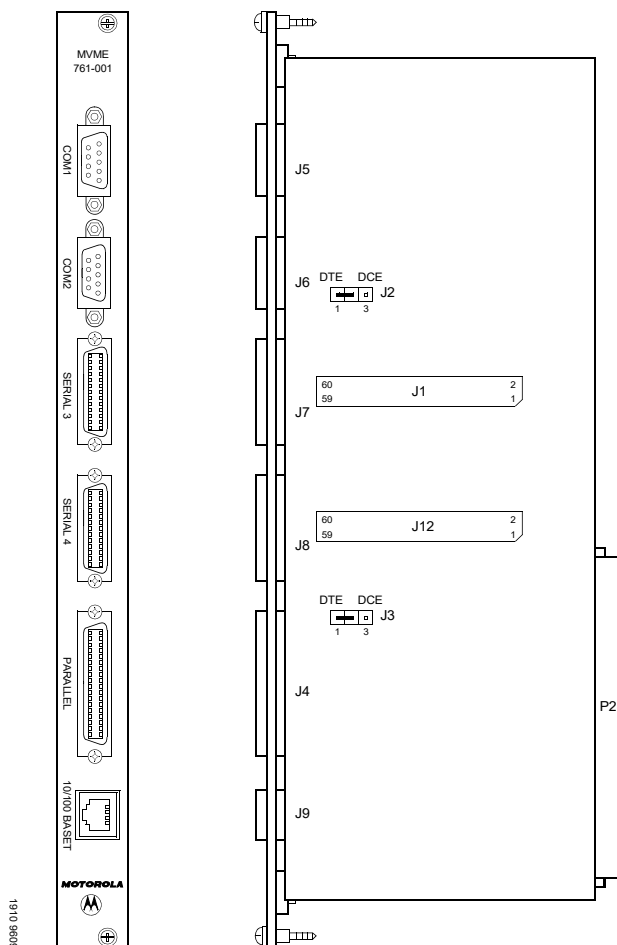


# 1.4    Serial Port Interface Modules

You may configure the asynchronous/synchronous serial ports (ports 3 and 4) to the appropriate interface by installing a Serial Interface Module (SIM). A SIM is a small "plug-in" printed circuit board that converts the TTL-level synchronous or asynchronous port signals to industry standard voltage levels used by the ports. The SIM contains the receiver and transmitter circuits for converting the input and output signals of the host VMEmodule to the appropriate serial data communication protocol.

The SIMs for the MVME761 are listed in the following table.

*Table 1-1 SIM Part Numbers*

| Interface | Model Number | Part Number |
|-----------|--------------|-------------|
| EIA-232-D DCE | SIM232DCE5E | 01-W3876B11A |
| EIA-232-D DTE | SIM232DTE5E | 01-W3877B11A |

Additional SIMs may be released. Please see your Emerson representative for a complete list of SIMS that are available for the MVME761-0x1.

# 1.5     P2 Adapter Boards

The P2 adapters route the asynchronous and synchronous port, printer port, and Ethernet signals to the MVME761 transition module.

# 1.6     Three-row P2 Adapter (MVME761-001)

The P2 adapter for the MVME761-001 mounts onto a 3-row, 96-pin P2 backplane connector. The 50-pin male connector, J2, carries the 8-bit SCSI signals from the host VMEmodules. To run SCSI devices, you may install an additional transition module that is equipped with a SCSI port, such as the MVME712B.

*Figure 1-2    Three Row P2 Adapter*
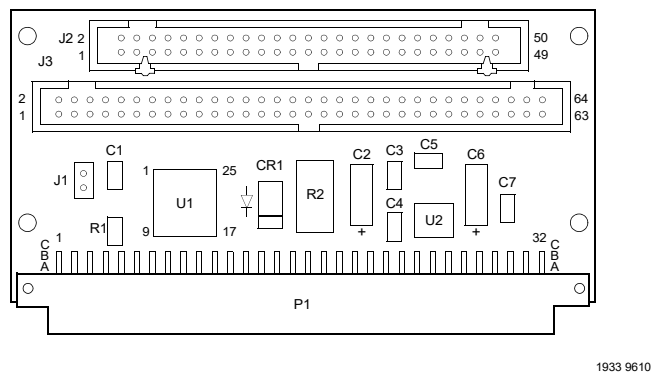


This P2 adapter, and the cable for connecting to the MVME761 transition module, can be ordered separately as model MVME761P2-001.

## 1.7     Five-Row P2 Adapter (MVME761-011)

The P2 adapter for the MVME761-011 mounts onto a 5-row, 160-pin P2 backplane connector. The 68- pin female connector, J1, carries 16-bit SCSI signals from the host VMEmodules. It also has a 64-pin male connector, J3, for PMC I/O.
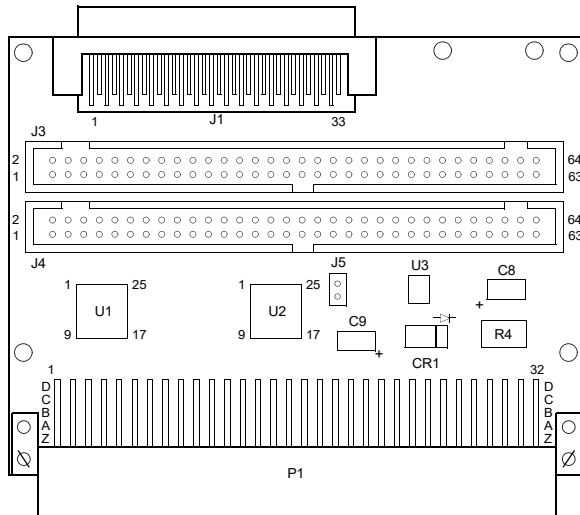
*Figure 1-3    Five Row P2 Adapter*



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This P2 adapter, and the cable for connecting to the MVME761 transition module, can be ordered separately as model MVME761P2-011.

## 1.8     Connectors and Cables

The connectors on the MVME761 transition module and the P2 adapters are listed in the following tables. The port connectors are located on the front panel, which is shown in Figure 1-1. See Table 1-5 on page 17 for a list of the cables. See Chapter 4, *Connector Pin Assignments*.

The cable used for connecting the MVME761 transition module to the P2 adapter is provided with the MVME761-0x1

1. You will need to purchase or fabricate the port cables.

*Table 1-2 MVME761 Transition Module Connectors*

| Type | Number | Description |
|------|--------|-------------|
| COM1 and COM2 | J5 J6 | 9-pin male DIN asynchronous serial port connector |
| Serial port 3 Serial port 4 | J7 J8 | 26-pin female HD-26 synchronous serial port connector |

*Table 1-2 MVME761 Transition Module Connectors (continued)*

| Type | Number | Description |
|------|--------|-------------|
| Parallel port | J4 | 36-pin female parallel port connector |
| 10Base-T, 100Base-TX | J9 | 8-pin female RJ-45 Ethernet port connector |
| SIM | J1, J12 | 60-pin female connector |
| VME | P2 | 64-pin male connector to J2 on the P2 adapter |

*Table 1-3 3-Row P2 Adapter Connectors (MVME761-001)*

| Type | Number | Description |
|------|--------|-------------|
| VME | P1 | 96-pin female DIN 41612 connector to the chassis backplane |
| | J3 | 64-pin male connector for output to P2 on the MVME761 transition module |
| SCSI | J2 | 50-pin male IDC connector for internal SCSI devices |

*Table 1-4 5-Row P2 Adapter Connectors (MVME761-011)*

| Type | Number | Description |
|------|--------|-------------|
| VME | P1 | 160-pin female DIN 41612 connector to the chassis backplane |
| | J4 | 64-pin male connector for output to P2 on the MVME761 transition module |
| PMC I/O | J3 | 64-pin male connector for PMC I/O |
| SCSI | J1 | 68-pin female IDC connector for internal SCSI devices |

*Table 1-5 Transition Module Cables*

| Part Number | Description |
|-------------|-------------|
| Included with the MVME761-0x1 | 64-line flat ribbon cable with 96-pin DIN connectors that connects P2 on the MVME761transition module to J3 on the 3-row P2 Adapter or J4 on the 5-row P2 adapter; 13 inches long. (30-W2799B02A). |
| User-supplied | EIA-232-D DTE or DCE cable (pins used depend on the processor VMEmodule) |
| User-supplied | Centronics- type parallel printer cable, male-to-male |
| User-supplied | 20-conductor cable; usually supplied with the modem |
| User-supplied | 6-conductor cable; usually supplied with the modem |
| CBL761HD26DB25 | Straight-through adapter cable with male HD-26 connector and female DB-25 connector, 3 feet long. (30-NW9302B27) |
| If you supply your own 64-line cable to connect the P2 adapter to the MVME761 transition module, the cable should not be longer than 1.5 feet. A longer cable is likely to cause problems, especially for the Ethernet and parallel port signals. | |

# 1.9    Specifications

The MVME761 transition module specifications are shown in the next table.

*Table 1-6 MVME761-0x1 Specifications*

| Characteristics | Specifications |
|---|---|
| Power Requirements | +12 Vdc, 100 mA typical, 200 mA maximum<br>-12 Vdc, 100 mA (for some of the SIMs) |
| Operating temperature | $0^o$ to $55^o$ C at chassis point of entry of forced air (approximately 5 CFM) |
| Storage temperature | $-40^o$ to $+85^o$ C |
| Relative Humidity | 5% to 90% (non-condensing) |
| Board Size<br>(excluding front panel) | Height: 9.187 inches(233.35 mm)<br>Height: 3.200 inches(80.00 mm)<br>Thickness: 0.063 inches (1.60 mm) |

# 1.10    Cooling Requirements

The MVME761-0x1 is tested to operate under forced air cooling with an incoming air temperature range of 0 degrees C to 55 degrees C. Adequate cooling can be achieved with air flowing over the module at 5 cubic feet per minute. The exact amount of airflow required for cooling depends on the ambient air temperature and the type, number, and location of modules and other heat sources.

# 1.11    FCC Compliance

The MVME761-0x1 was tested in an FCC-compliant chassis, and meets the requirements for Class A equipment. For minimum RF emissions, it is essential that you implement the following conditions:

● Install shielded cables on all external I/O ports

● Connect conductive chassis rails to earth ground to provide a path for connecting shields to earth ground

● Tighten all front panel screws

# *Hardware Preparation and Installation*

<div style="text-align: right; font-size: 3em;">**2**</div>

## 2.1    Overview

This chapter provides unpacking instructions, hardware preparation, and installation instructions for the MVME761 transition module, the P2 adapter, and the Serial Interface Modules (SIMs).

## 2.2    Unpacking the Hardware

The MVME761 is packed in an antistatic wrapper to protect it from static discharge. Emerson strongly recommends that you use an antistatic wrist strap and a conductive foam pad when handling the equipment. Electronic components can be extremely sensitive to electrostatic discharge (ESD). After removing the board from the protective wrapper, place it component side up on a grounded, static-free surface. Do not slide the board over any surface.

Unpack the equipment from the shipping carton. Refer to the packing list and verify that all the items are present. Save the packing material for storing and reshipping of the equipment.

## 2.3    Installing the Serial Interface Modules

Configure the serial ports 3 and 4 for the required interface by installing the appropriate SIM. See Table 1-1 on page 15 for a list of the serial port interface types.

Prior to installing the SIMs, set the jumpers on header J2 (for serial port 3) and header J3 (for serial port 4) for either DCE or DTE. Set the jumper to position:
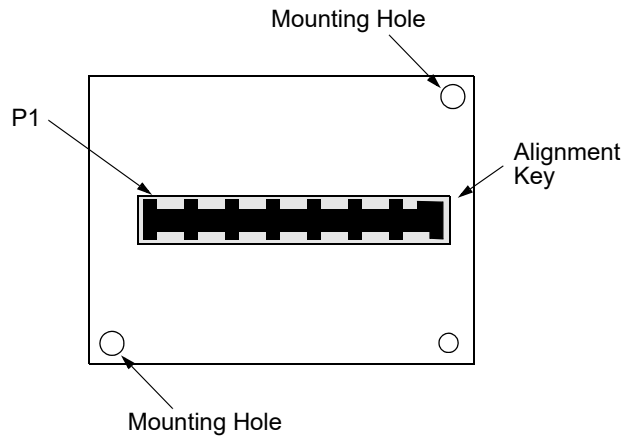
- 1-2 if the SIM is for a DTE interface

- 2-3 if the SIM is for a DCE

*Figure 2-1    Serial Port Interface Jumper Setting*
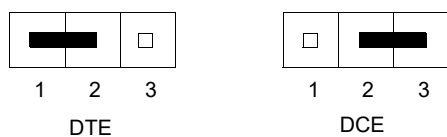
You must set the jumpers and install the SIMs prior to installing the MVME761 transition module in the system chassis.The SIMs plug into connector J1 (for serial port 3) or J12 (for serial port 4) on the MVME761 transition module.

*Figure 2-2    SIM Configuration*



**Procedure**

Install the SIMs on the MVME761 transition module per the following procedure:

1. Align the SIM so that P1 on the SIM lines up with the appropriate SIM connector (J1 for serial port 3 or J12 for serial port 4) on the transition module. Note the position of the alignment key on P1. See Figure 2-2 on page 20.

2. Place the SIM onto the transition module SIM connector, making sure that the mounting holes also line up with the standoffs on the transition module as shown in Figure 2-3 on page 21.

3. Gently press the top of the SIM to seat it on the transition module SIM connector. If the SIM does not seat with gentle pressure, re-check the alignment of the connectors.

Do not force the SIM onto the transition module.

**4.** Secure the SIM to the transition module standoffs with the two Phillips-head screws provided. Do not over tighten the screws.

*Figure 2-3    Installing the SIM*
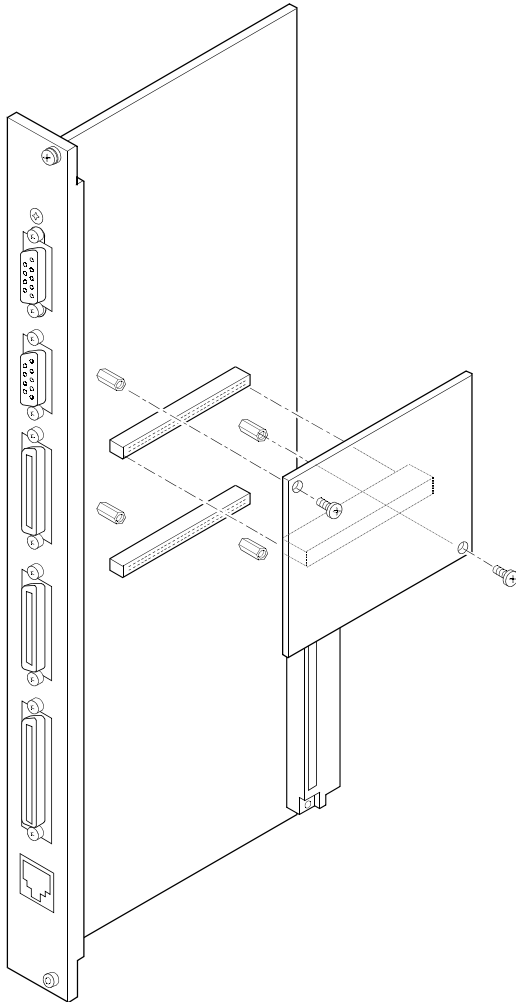


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## 2.4    Installing the Transition Module and P2 Adapter

Install the MVME761 transition module and P2 adapter in the system chassis. The P2 adapter is required because the P2 connector on the transition module is not compatible with the P2 connector on the chassis backplane.

**Use ESD protection**

**Emerson strongly recommends that you use an antistatic wrist strap and a conductive foam pad when installing or upgrading a system. Electronic components, such as disk drives, computer boards, and memory modules, can be extremely sensitive to electrostatic discharge (ESD). After removing the component from its protective wrapper or from the system, place the component flat on a grounded, static-free surface (and, in the case of a board, component side up). Do not slide the component over any surface.**

**If an ESD station is not available, you can avoid damage resulting from ESD by wearing an antistatic wrist strap (available at electronics stores) that is attached to an active electrical ground. Note that a system chassis may not be grounded if it is unplugged.**

Install the MVME761-0x1 in the system chassis according to the procedures in this chapter.

| *NOTICE* |
|---|
| **An MVME5100/MVME5500 module that is designed for use with an MVME712M Transition Module will be damaged if you use it with an MVME761-0x1 Transition Module.**<br>**Connecting modules while power is applied may result in damage to components on the module.** |

| ⚠ WARNING |
|---|
| **Dangerous voltages, capable of causing death, are present in this equipment. use extreme caution when handling, testing, and adjusting.** |

*Figure 2-4    Chassis Connections*
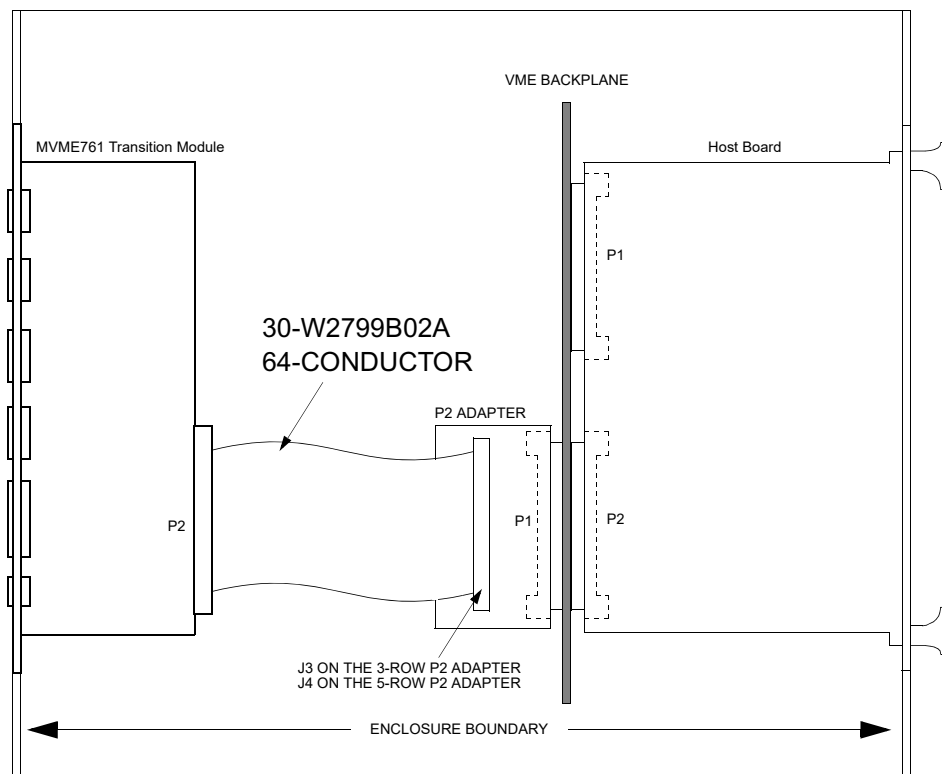


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**Procedure**

Follow these steps to configure, install, and cable the transition module.

1. Turn all equipment power OFF and disconnect the power cable from the AC power source.

2. Remove the chassis cover per the instructions in the equipment user's manual.

3. If the chassis has a rear card cage, remove the filler panel(s) from the appropriate card slot(s) at the rear of the chassis.

4. If necessary, move some of the other modules to allow space for the cables connected to the P2 adapter and the transition module.

5. Install the jumper on header J1 (on the 3-row P2 adapter or header J5 on the 5-row P2 adapter) if you are supporting SCSI devices.

6. Attach the P2 adapter, for either the 3-row or 5-row version, to the backplane connector that is directly in line with the P2 connector on the host VMEmodule.

7. Orient pin 1 of the P2 adapter's connector with pin 1 of the backplane connector.

8.  Attach the 64-conductor cable (furnished with the MVME761-0x1) to the P2 adapter (J3 on the 3-row version, J4 on the 5-row version). Be sure to orient cable pin 1 with connector pin 1.

9.  Attach the 64-conductor cable to connector P2 on the transition module. Be sure to orient cable pin 1 with connector pin 1.

10. Insert the transition module into the chassis slot, and tighten the attaching screws. Make sure there is good contact with the transverse mounting rails in order to minimize RF emissions.

11. Install the chassis cover, making sure that cables are not pinched by the cover.

12. Connect the power cable to the AC power source.

# *Functional Description*

**3**

## 3.1  Overview

This chapter provides information on MVME761 transition module and SIM circuitry, P2 signal multiplexing, and the configuration of the serial ports.

## 3.2  Circuitry

The MVME761 transition module and the Serial Interface Modules (SIMs) convert the TTL level signals to and from the MVME5100, and MVME5500 modules to the reception and transmission levels specified by the appropriate port interface standard.

The MVME761 transition module contains a small amount of "house keeping" circuitry. Bulk capacitors are on the power sources (+5Vdc, +12Vdc, and -12Vdc). Pullup resistors put the inputs to the host board in a known high even when no SIM is installed.
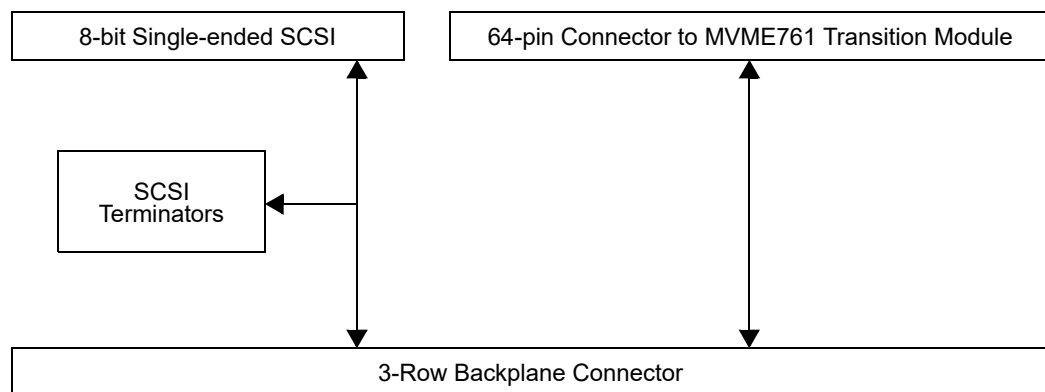
The block diagram for the MVME761 transition module is shown in Figure 3-1. The block diagram for the 3-row DIN backplane P2 adapter is shown in Figure 3-2. The block diagram for the 5-row DIN backplane P2 adapter is shown in Figure 3-3.

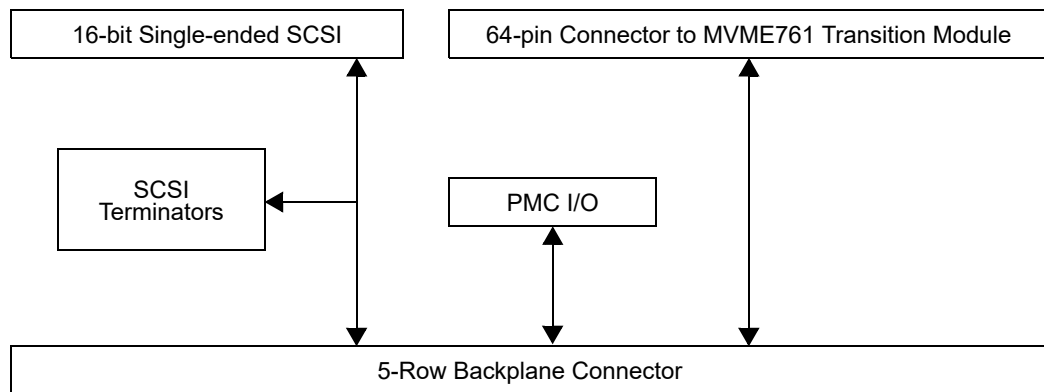*Figure 3-1    Transition Module Block Diagram*
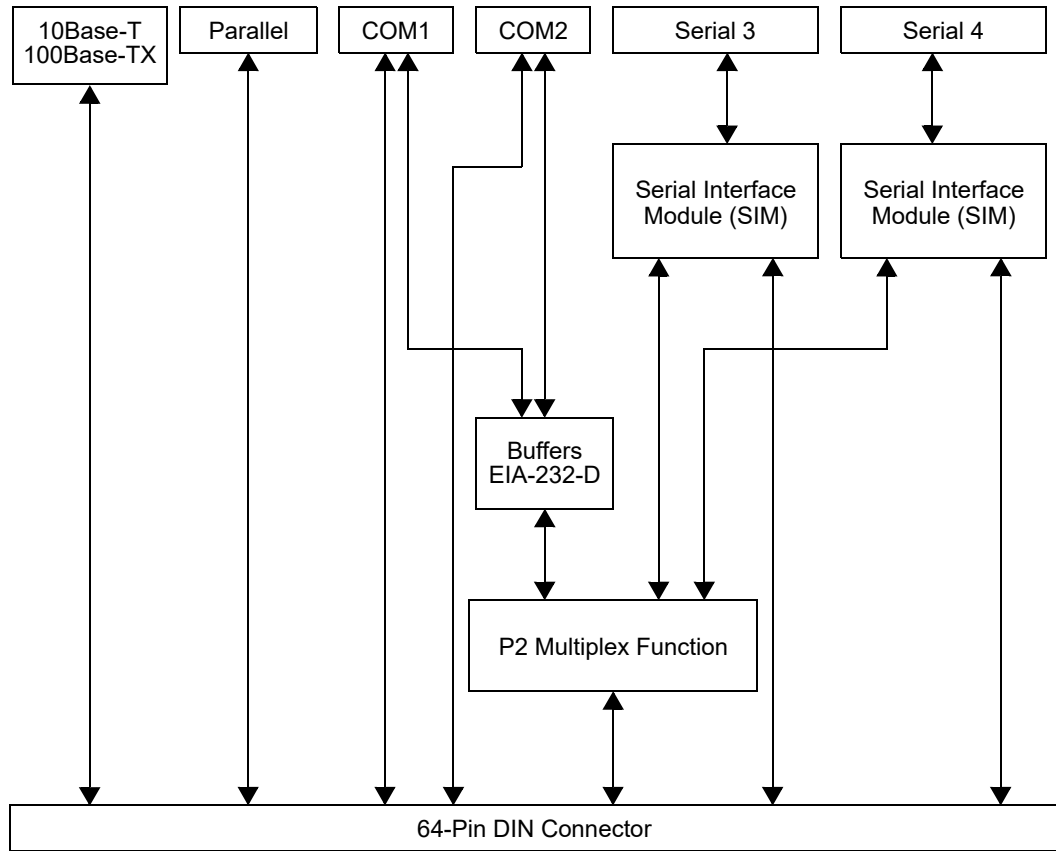


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*Figure 3-2    3-Row DIN Backplane P2 Adapter Block Diagram*



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*Figure 3-3    5-Row DIN Backplane P2 Adapter Block Diagram*



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# 3.3    P2 Signal Multiplexing (P2MX)

Because of a limited number of pins on the P2 connector, both the VME processor board and the MVME761 transition module multiplex and demultiplex some of the P2 signals. This function, called P2MX is transparent to the software and the user.

Four pins are used for the signal multiplexing:

● MXCLK

● MXSYNC#

● MXDO

● MXDI

Sixteen time slots are defined and allocated. The signal multiplexing sequences are listed in the following table..

*Table 3-1 P2 signal multiplexing sequence*

| MXDO (from the MVME510x/MVME550x) | | MXDI (from the MVME7616E) | |
|---|---|---|---|
| **Time Slot** | **Signal Name** | **Time Slot** | **Signal Name** |
| 0 | RTS3 | 0 | CTS3 |
| 1 | DTR3 | 1 | DSR3/MID1 |
| 2 | LLB3/MODSEL | 2 | DCD3 |
| 3 | RLB3 | 3 | TM3/MID0 |
| 4 | RTS4 | 4 | RI3 |
| 5 | DTR4 | 5 | CTS4 |
| 6 | LLB4 | 6 | DSR4/MID3 |
| 7 | RLB4 | 7 | DCD4 |
| 8 | IDREQ# | 8 | TM4/MID2 |
| 9 | DTR1 | 9 | RI4 |
| 10 | DTR2 | 10 | RI1 |
| 11 | Reserved | 11 | DSR1 |
| 12 | Reserved | 12 | DCD1 |
| 13 | Reserved | 13 | RI2 |
| 14 | Reserved | 14 | DSR2 |
| 15 | Reserved | 15 | DCD2 |

- MXCLK is the 10MHz bit clock for the time-multiplexed data lines, MXDO and MXDI.

- MXSYNC# is asserted for one bit time at Time Slot 15 by the MVME5100 and MVME5500

  MXSYNC# is used by the MVME761 transition module to synchronize with the VME modules.

- MXDO is the time-multiplexed output line from the main board and MXDI is the time-multiplexed line from the MVME761 transition module. A 16-to-1 multiplexing scheme is used with a 10MHz bit rate.

MXSYNC# is clocked out using the falling edge of MXCLK and MDXO is clocked out with the rising edge of the MXCLK. MXDI is sampled at the rising edge of MXCLK (the transition module synchronizes MXDI with MXCLK's rising edge).

The timing relationships among MXCLK, MXSYNC#, MXDO, and MXDI are illustrated in the next figure.

*Figure 3-4    Multiplex Signal Timing Chart*
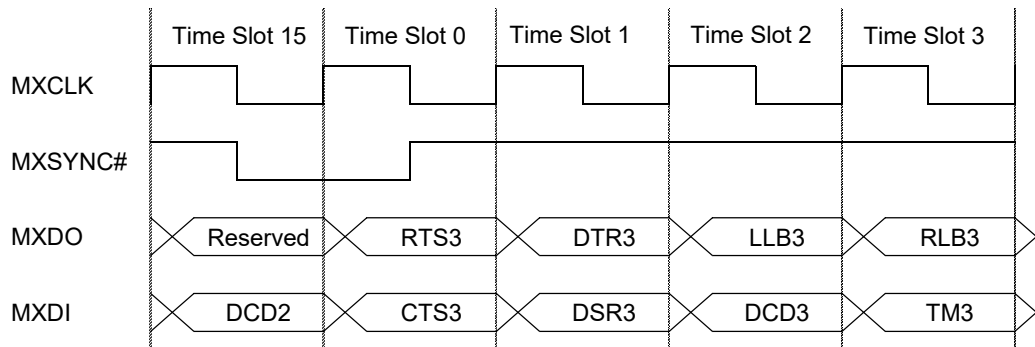


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# 3.4    Serial Interface Module Circuitry

Each Serial Interface Module has a 60-pin connector that provides all signal and power connections to the MVME761 transition module.

TTL-level signals
All TTL-level signals, with the exception of data and clocks, are active low. The pullup resistors on the MVME761 transition module drive all TTL inputs to the SIM to a known logic level.

SIMs
The SIMs have surge suppression circuitry for all port signals going to the external connector. This consists of a series resistor and a dual 15V clamp diode to chassis ground. All series resistors are 100 ohms except on the EIA-530 balanced drives, which use 10 ohm series resistors.

EIA-232-D SIMs employ MC145406 ICs as line transmitters to convert the TTL output signals from the host VMEmodule to EIA-232-D voltage levels. As line receivers, the MC145406 ICs convert the EIA-232-D input signals to TTL voltage levels which are sent to the VME module.

The MC145406 transceiver IC requires a series diode on the +12V supply and a clamp diode to logic ground on the -12V supply. The diodes are located on the transition module rather than on the SIM due to space limitations.

For all port interfaces, the SIMs support the transmitter signal element timing as either input or output signals.

# 3.5   COM1 and COM2 Asynchronous Serial Ports

The asynchronous serial port (COM1 and COM2) configuration is shown in the next figures..

*Figure 3-5    EIA-574 DTE Port Configuration*
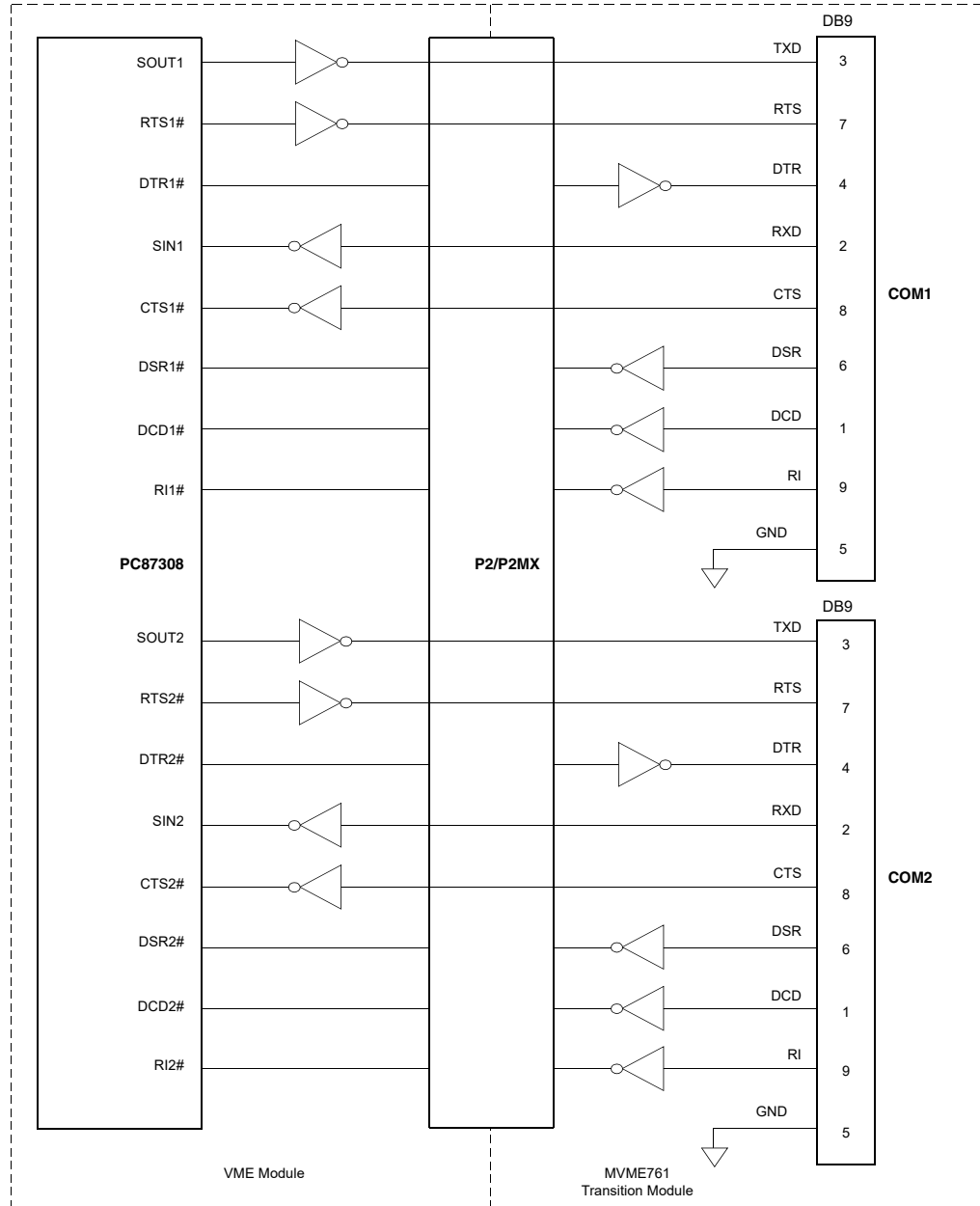
# 3.6    Asynchronous/Synchronous Serial Ports

The asynchronous/synchronous serial port (Port 3 and Port 4) interface configuration diagrams are on the following pages.

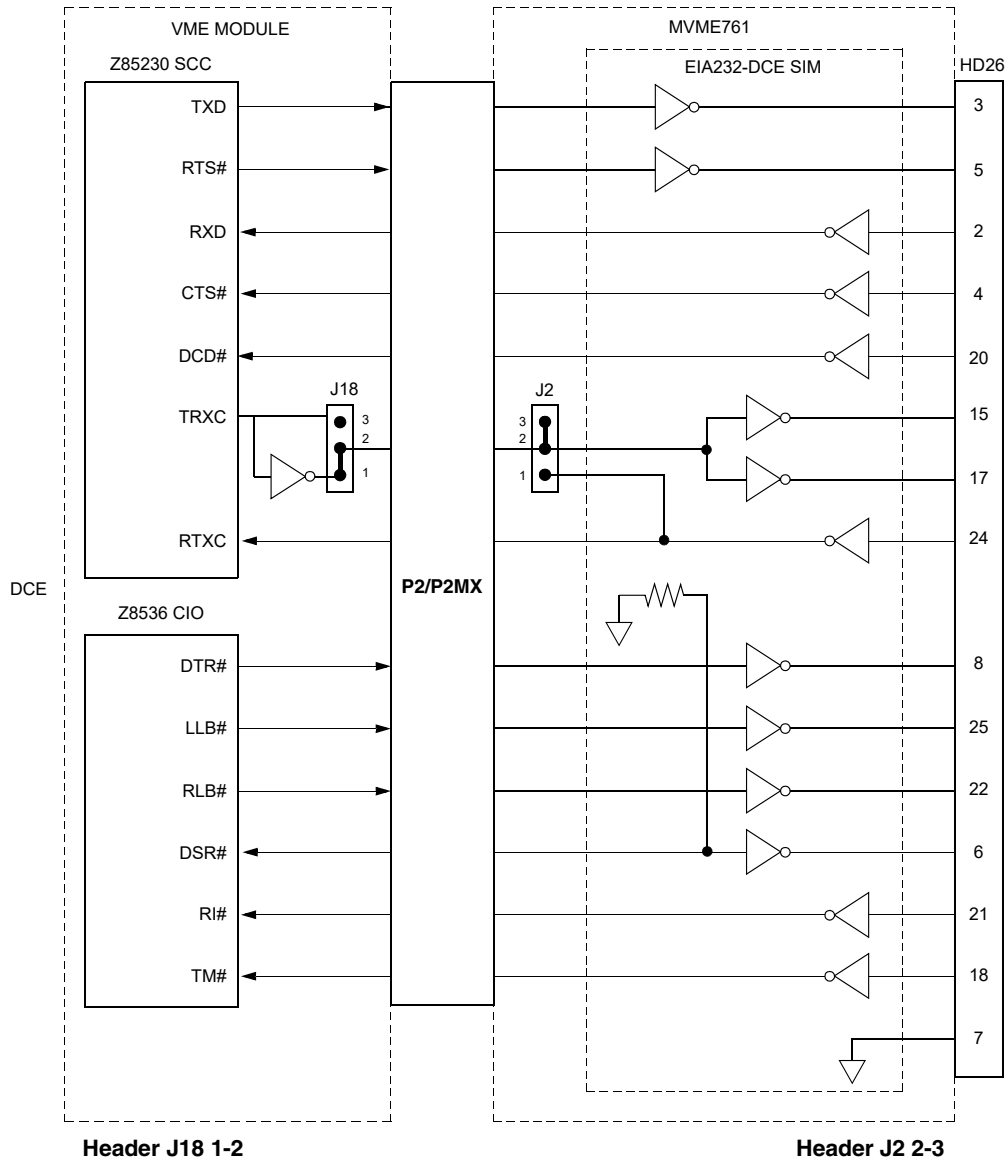*Figure 3-6    EIA232-DCE Copnfirguration Port 3*
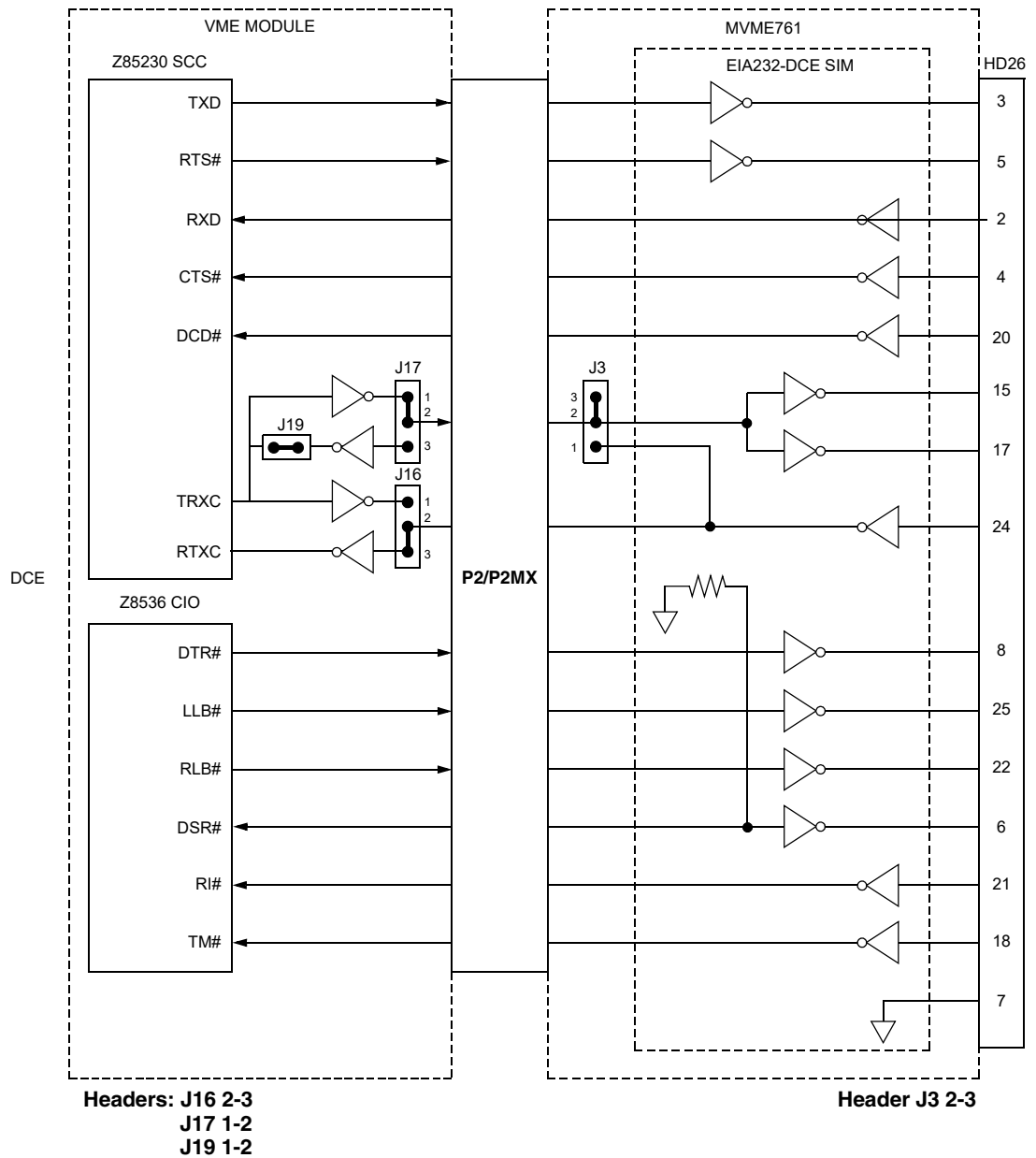
*Figure 3-7    EIA232-DCE Configuration Port 4*



**Headers: J16 2-3**
**J17 1-2**
**J19 1-2**

**Header J3 2-3**

*Figure 3-8    EIA232-DTE Configuration Port 3*
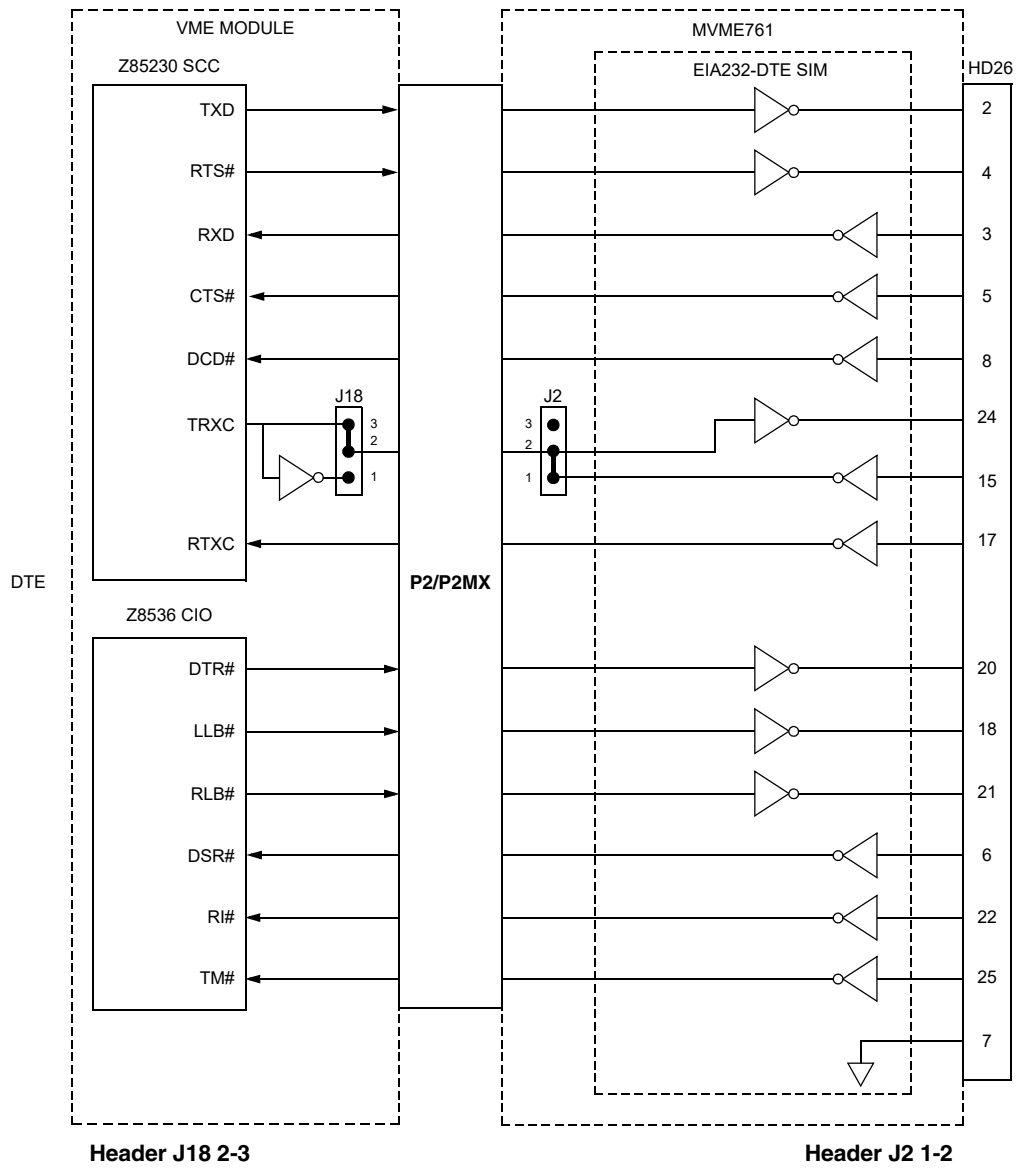
*Figure 3-9    EIA232-DTE Configuration Port 4*

# *Connector Pin Assignments*

**4**
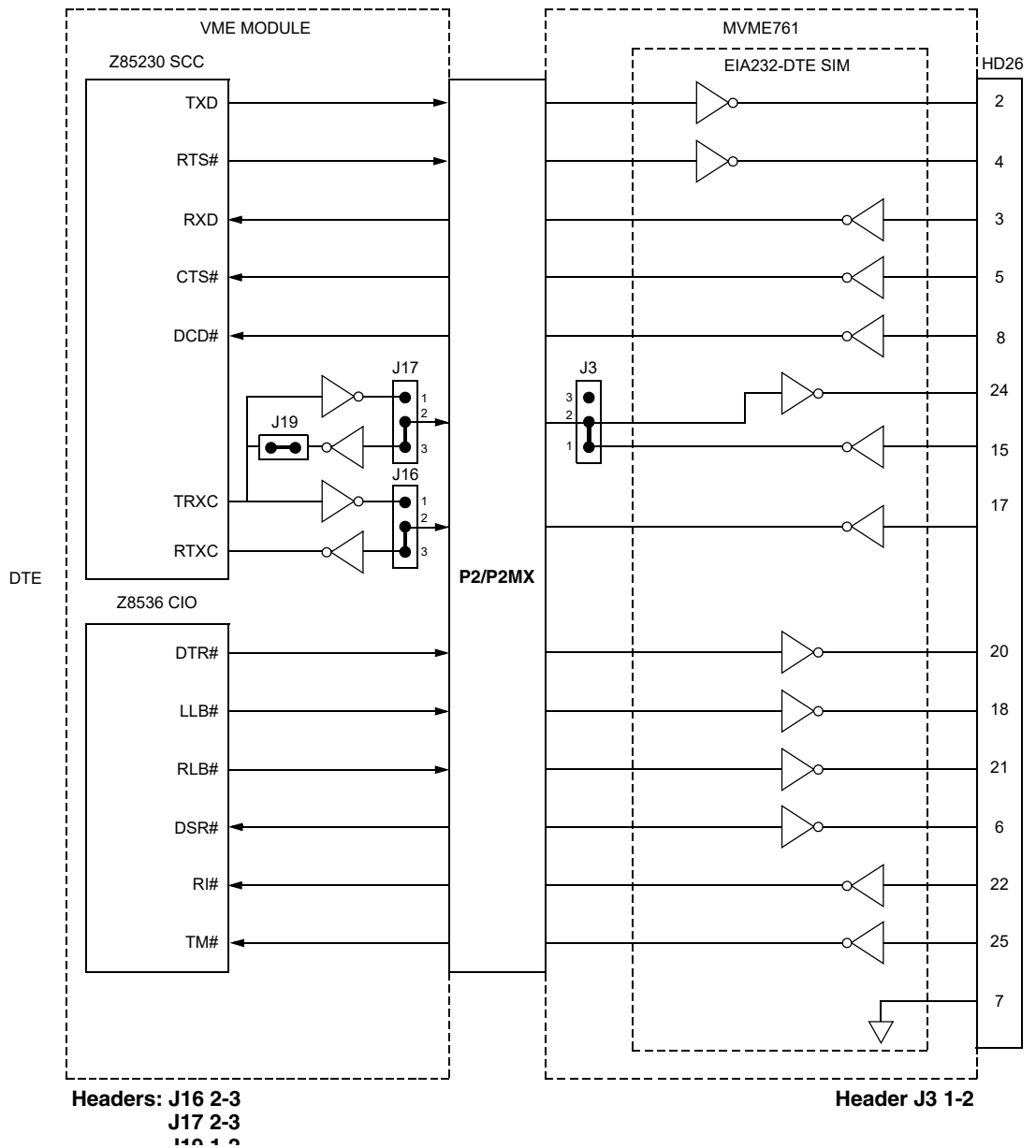
## 4.1 Overview

This chapter provides the pin assignments for the P2 connector and front panel port connectors on the MVME761 transition module, as well as for the SCSI and PMC I/O connectors on the P2 adapters.

## 4.2 P2 Connector

Signaling and power from the host VMEmodules are received through connector P2, a 64-pin DIN connector. Because the P2 adapter reroutes some of the signals, connector P2 on the MVME761 transition module is not pin-for-pin compatible with connector P2 on the host VMEmodules.

The pin assignments and signal mnemonics for the MVME761 transition module P2 connector are listed in the following table.

*Table 4-1 P2 Connector Pin Assignments*

| Row A Pins | | Row C Pins | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | C- (R- for RJ-45 J9) | 1 | C+ (R+ for RJ-45 J9) |
| 2 | T- | 2 | T+ |
| 3 | R- | 3 | R+ |
| 4 | +12VF | 4 | PRSTB# |
| 5 | GND | 5 | PRD0 |
| 6 | PRD1 | 6 | PRD2 |
| 7 | PRD3 | 7 | PRD4 |
| 8 | PRD5 | 8 | PRD6 |
| 9 | PRD7 | 9 | GND |
| 10 | PRACK# | 10 | GND |
| 11 | PRBSY | 11 | PRPE |
| 12 | PRSEL | 12 | INPRIME# |
| 13 | PRFAULT# | 13 | GND |
| 14 | AUTOFD# | 14 | GND |
| 15 | SELIN# | 15 | GND |
| 16 | TXD3 | 16 | RXD3 |
| 17 | RTXC3 | 17 | TRXC3 |

*Table 4-1 P2 Connector Pin Assignments  (continued)*

| Row A Pins | | Row C Pins | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 18 | GND | 18 | TXD1_232 |
| 19 | GND | 19 | RXD1_232 |
| 20 | GND | 20 | RTS1_232 |
| 21 | CTS1 | 21 | GND |
| 22 | TXD4 | 22 | GND |
| 23 | RXD4 | 23 | GND |
| 24 | RTXC4 | 24 | GND |
| 25 | TRXC4 | 25 | GND |
| 26 | No Connect | 26 | -12VF |
| 27 | MSYNC# | 27 | GND |
| 28 | MCLK | 28 | GND |
| 29 | TXD2_232 | 29 | GND |
| 30 | RXD2_232 | 30 | GND |
| 31 | RTS2_232 | 31 | CTS2_232 |
| 32 | MDO | 32 | MDI |

# 4.3    Asynchronous Serial Port Connectors (J5/J6)

The interface for the asynchronous serial ports, COM1 and COM2, is provided with two standard DB9 connectors, J5 and J6. The connector shields for these ports are tied to chassis ground. The pin assignments and signal mnemonics for these connectors are listed in Table 4-2.

*Table 4-2 COM1 and COM2 Pin Assignments*

| Pin | Signal |
|---|---|
| 1 | DCD |
| 2 | RXD |
| 3 | TXD |
| 4 | DTR |
| 5 | GND |
| 6 | DSR |
| 7 | RTS |
| 8 | CTS |
| 9 | RI |

## 4.4    Asynchronous/Synchronous serial Port connectors (J7/J8)

The interface for the asynchronous/synchronous serial ports 3 and 4 is provided by two HD-26 connectors, J7 and J8. The connector shields for these ports are tied to chassis ground.

The pin assignments and signal mnemonics for serial ports 3 and 4 are listed in the following tables.

*Table 4-3 Serial Port 3 Pin Assignments*

| Pin | Signal | Pin | Signal |
|-----|------------|-----|------------|
| 1 | No Connect | 14 | SP3_P14 |
| 2 | TXD3 | 15 | TXCI3 |
| 3 | RXD3 | 16 | SP3_P16 |
| 4 | RTS3 | 17 | RXCI3 |
| 5 | CTS3 | 18 | LLB3 |
| 6 | DSR3 | 19 | SP3_P19 |
| 7 | GND | 20 | DTR3 |
| 8 | DCD3 | 21 | RLB3 |
| 9 | SP3_P9 | 22 | RI3 |
| 10 | SP3_P10 | 23 | SP3_P23 |
| 11 | SP3_P11 | 24 | TXCO3 |
| 12 | SP3_P12 | 25 | TM3 |
| 13 | SP3_P13 | 26 | No Connect |

*Table 4-4 Serial Port 4 Pin Assignments*

| Pin | Signal | Pin | Signal |
|-----|------------|-----|------------|
| 1 | No Connect | 14 | SP4_P14 |
| 2 | TXD4 | 15 | TXCI4 |
| 3 | RXD4 | 16 | SP4_P16 |
| 4 | RTS4 | 17 | RXCI4 |
| 5 | CTS4 | 18 | LLB4 |
| 6 | DSR4 | 19 | SP4_P19 |
| 7 | GND | 20 | DTR4 |
| 8 | DCD4 | 21 | RLB4 |
| 9 | SP4_P9 | 22 | RI4 |
| 10 | SP4_P10 | 23 | SP4_P23 |
| 11 | SP4_P11 | 24 | TXCO4 |
| 12 | SP4_P12 | 25 | TM4 |

*Table 4-4 Serial Port 4 Pin Assignments  (continued)*

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 13 | SP4_P13 | 26 | No Connect |

# 4.5    Parallel I/O Port Connector (J4)

The interface for the parallel port is a standard IEEE P1284-C, 36-pin connector, J4. The functionality of each signal depends on the mode of operation of this bidirectional Parallel Peripheral Interface. Refer to the IEEE P1284 D2.00 Standard for a complete description of each signal function. The connector shield is tied to chassis ground.

The pin assignments and signal mnemonics for this connector are listed in .

*Table 4-5 Parallel I/O Connector Pin Assignments*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 1 | PRBSY | GND | 19 |
| 2 | PRSEL | GND | 20 |
| 3 | PRACK_ | GND | 21 |
| 4 | PRFAULT_ | GND | 22 |
| 5 | PRPE | GND | 23 |
| 6 | PRD0 | GND | 24 |
| 7 | PRD1 | GND | 25 |
| 8 | PRD2 | GND | 26 |
| 9 | PRD3 | GND | 27 |
| 10 | PRD4 | GND | 28 |
| 11 | PRD5 | GND | 29 |
| 12 | PRD6 | GND | 30 |
| 13 | PRD7 | GND | 31 |
| 14 | INPRIME_ | GND | 32 |
| 15 | PRSTB_ | GND | 33 |
| 16 | SELIN_ | GND | 34 |
| 17 | AUTOFD_ | GND | 35 |
| 18 | Pull-up | No Connect | 36 |

# 4.6    Ethernet Connector (J9)

The 10Base-T/100Base-TX Ethernet interface is a RJ-45 connector, J9. The connector shield is tied to chassis ground. The pin assignments and signal mnemonics for this connector are listed in Table 4-6.

*Table 4-6 10Base-T/100Base-TX Pin Assignments*

| Pin | Signal |
|-----|--------|
| 1 | TD+ |
| 2 | TD- |
| 3 | RD+ |
| 4 | Terminated |
| 5 | Terminated |
| 6 | RD- |
| 7 | Terminated |
| 8 | Terminated |

# 4.7    P2 Adapter Connectors

## 4.7.1    3-Row P2 Adapter (J2)

The 8-bit SCSI connector on the 3-row DIN backplane P2 Adapter is a 50-pin connector, J2. The pin assignments and signal mnemonics for this connector are listed in Table 4-7.

*Table 4-7 8-bit SCSI Connector (3-Row P2 adapter)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 1 | GND | TERMPWR | 26 |
| 2 | SDB0 | GND | 27 |
| 3 | GND | GND | 28 |
| 4 | SDB1 | GND | 29 |
| 5 | GND | GND | 30 |
| 6 | SDB2 | GND | 31 |
| 7 | GND | ATN | 32 |
| 8 | SDB3 | GND | 33 |
| 9 | GND | GND | 34 |
| 10 | SDB4 | GND | 35 |
| 11 | GND | BSY | 36 |
| 12 | SDB5 | GND | 37 |

*Table 4-7 8-bit SCSI Connector (3-Row P2 adapter)  (continued)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 13 | GND | ACK | 38 |
| 14 | SDB6 | GND | 39 |
| 15 | GND | RST | 40 |
| 16 | SDB7 | GND | 41 |
| 17 | GND | MSG | 42 |
| 18 | DBP | GND | 43 |
| 19 | GND | SEL | 44 |
| 20 | GND | GND | 45 |
| 21 | GND | D/C | 46 |
| 22 | GND | GND | 47 |
| 23 | GND | REQ | 48 |
| 24 | GND | GND | 49 |
| 25 | No Connect | O/I | 50 |

## 4.7.2    3-Row P2 Adapter (J3)

The pin assignments and signal mnemonics for this connector are listed in Table 4-8.

*Table 4-8 VME Connector (3-Row P2 adapter)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 1 | C+ | DCD3 | 33 |
| 2 | C- | DTR3 | 34 |
| 3 | T+ | TXD1 | 35 |
| 4 | T- | GND | 36 |
| 5 | R+ | RXD1 | 37 |
| 6 | R- | GND | 38 |
| 7 | PRSTB_L | RTS1 | 39 |
| 8 | +12VF | GND | 40 |
| 9 | PRD0 | GND | 41 |
| 10 | GND | CTS1 | 42 |
| 11 | PRD2 | GND | 43 |
| 12 | PRD1 | TXD4 | 44 |
| 13 | PRD4 | GND | 45 |
| 14 | PRD3 | RXD4 | 46 |
| 15 | PRD6 | GND | 47 |
| 16 | PRD5 | RTS4 | 48 |

*Table 4-8 VME Connector (3-Row P2 adapter)  (continued)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 17 | GND | GND | 49 |
| 18 | PRD7 | TRXC4 | 50 |
| 19 | GND | DTR4 | 51 |
| 20 | PRACK_L | CTS4 | 52 |
| 21 | PRPE | GND | 53 |
| 22 | PRBSY | DCD4 | 54 |
| 23 | PRINIT_L | GND | 55 |
| 24 | PRSEL | RTXC4 | 56 |
| 25 | GND | GND | 57 |
| 26 | PRFAULT_L | TXD2 | 58 |
| 27 | GND | GND | 59 |
| 28 | TXD3 | RXD2 | 60 |
| 29 | GND | CTS2 | 61 |
| 30 | RXD3 | RTS2 | 62 |
| 31 | CTS3 | DCD2 | 63 |
| 32 | RTS3 | DTR2 | 64 |

## 4.7.3    5-Row P2 adapter (J1)

The 16-bit SCSI connector on the 5-row DIN backplane P2 Adapter is a 68-pin connector, J1. The pin assignments and signal mnemonics for this connector are listed in Table 4-9.

*Table 4-9 16-bit SCSI Connector (5-Row P2 adapter)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 1 | GND | SDB12 | 35 |
| 2 | GND | SDB13 | 36 |
| 3 | GND | SDB14 | 37 |
| 4 | GND | SDB15 | 38 |
| 5 | GND | DBP1 | 39 |
| 6 | GND | SDB0 | 40 |
| 7 | GND | SDB1 | 41 |
| 8 | GND | SDB2 | 42 |
| 9 | GND | SDB3 | 43 |
| 10 | GND | SDB4 | 44 |
| 11 | GND | SDB5 | 45 |
| 12 | GND | SDB6 | 46 |

*Table 4-9 16-bit SCSI Connector (5-Row P2 adapter)  (continued)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 13 | GND | SDB7 | 47 |
| 14 | GND | DBP0 | 48 |
| 15 | GND | GND | 49 |
| 16 | GND | GND | 50 |
| 17 | TERMPWR | TERMPWR | 51 |
| 18 | TERMPWR | TERMPWR | 52 |
| 19 | No Connect | No Connect | 53 |
| 20 | GND | GND | 54 |
| 21 | GND | ATN | 55 |
| 22 | GND | GND | 56 |
| 23 | GND | BSY | 57 |
| 24 | GND | ACK | 58 |
| 25 | GND | RST | 59 |
| 26 | GND | MSG | 60 |
| 27 | GND | SEL | 61 |
| 28 | GND | D/C | 62 |
| 29 | GND | REQ | 63 |
| 30 | GND | O/I | 64 |
| 31 | GND | SDB8 | 65 |
| 32 | GND | SDB9 | 66 |
| 33 | GND | SDB10 | 67 |
| 34 | GND | SDB11 | 68 |

## 4.7.4    PMC I/O, 5-Row P2 Adapter (J3)

The PMC I/O connector on the 5-row DIN backplane P2 Adapter is a 64-pin connector, J3. The pin assignments and signal mnemonics for this connector are listed in Table 4-10.

*Table 4-10 PMC I/O Connector (5-Row P2 adapter)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 1 | GND | GND | 33 |
| 2 | PMCIO0 | PMCIO16 | 34 |
| 3 | GND | GND | 35 |
| 4 | PMCIO1 | PMCIO17 | 36 |
| 5 | GND | GND | 37 |
| 6 | PMCIO2 | PMCIO18 | 38 |

*Table 4-10 PMC I/O Connector (5-Row P2 adapter)  (continued)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 7 | GND | GND | 39 |
| 8 | PMCIO3 | PMCIO19 | 40 |
| 9 | GND | GND | 41 |
| 10 | PMCIO4 | PMCIO20 | 42 |
| 11 | GND | GND | 43 |
| 12 | PMCIO5 | PMCIO21 | 44 |
| 13 | GND | GND | 45 |
| 14 | PMCIO6 | PMCIO22 | 46 |
| 15 | GND | GND | 47 |
| 16 | PMCIO7 | PMCIO23 | 48 |
| 17 | GND | GND | 49 |
| 18 | PMCIO8 | PMCIO24 | 50 |
| 19 | GND | GND | 51 |
| 20 | PMCIO9 | PMCIO25 | 52 |
| 21 | GND | GND | 53 |
| 22 | PMCIO10 | PMCIO26 | 54 |
| 23 | GND | GND | 55 |
| 24 | PMCIO11 | PMCIO27 | 56 |
| 25 | GND | GND | 57 |
| 26 | PMCIO12 | PMCIO28 | 58 |
| 27 | GND | GND | 59 |
| 28 | PMCIO13 | PMCIO29 | 60 |
| 29 | GND | GND | 61 |
| 30 | PMCIO14 | PMCIO30 | 62 |
| 31 | GND | GND | 63 |
| 32 | PMCIO15 | PMCIO31 | 64 |

## 4.7.5    5-Row P2 adapter (J4)

The J4 connector on the 5-row P2 adapter is a VME, 64-pin male connector used for output to the P2 connector on the MVME761.

*Table 4-11 VME Connector (3-Row P2 adapter)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 1 | C+ | DCD3 | 33 |
| 2 | C- | DTR3 | 34 |

*Table 4-11 VME Connector (3-Row P2 adapter)  (continued)*

| Pin | Signal | Signal | Pin |
|-----|--------|--------|-----|
| 3 | T+ | TXD1 | 35 |
| 4 | T- | GND | 36 |
| 5 | R+ | RXD1 | 37 |
| 6 | R- | GND | 38 |
| 7 | PRSTB_L | RTS1 | 39 |
| 8 | +12VF | GND | 40 |
| 9 | PRD0 | GND | 41 |
| 10 | GND | CTS1 | 42 |
| 11 | PRD2 | GND | 43 |
| 12 | PRD1 | TXD4 | 44 |
| 13 | PRD4 | GND | 45 |
| 14 | PRD3 | RXD4 | 46 |
| 15 | PRD6 | GND | 47 |
| 16 | PRD5 | RTS4 | 48 |
| 17 | GND | GND | 49 |
| 18 | PRD7 | TRXC4 | 50 |
| 19 | GND | DTR4 | 51 |
| 20 | PRACK_L | CTS4 | 52 |
| 21 | PRPE | GND | 53 |
| 22 | PRBSY | DCD4 | 54 |
| 23 | PRINIT_L | GND | 55 |
| 24 | PRSEL | RTXC4 | 56 |
| 25 | GND | GND | 57 |
| 26 | PRFAULT_L | TXD2 | 58 |
| 27 | GND | GND | 59 |
| 28 | TXD3 | RXD2 | 60 |
| 29 | GND | CTS2 | 61 |
| 30 | RXD3 | RTS2 | 62 |
| 31 | CTS3 | DCD2 | 63 |
| 32 | RTS3 | DTR2 | 64 |

# *Index*