CoreModule™ 800
PCI-104
Single Board Computer
QuickStart Guide

P/N 5001756A Revision A

Notice Page

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REVISION HISTORY

Revision	Reason for Change	Date
A, A	Initial Release	Sept/06

Ampro Computers, Incorporated
5215 Hellyer Avenue
San Jose, CA 95138-1007
Tel. 408 360-0200
Fax 408 360-0222
www.ampro.com

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Audience Assumptions

This guide is for the person who designs computer related equipment, including but not limited to hardware and software design and implementation of the same. Ampro Computers, Inc. assumes you are qualified in designing and implementing your hardware designs and its related software into your prototype computer equipment.

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Chapter 1   Setting Up the CoreModule 800

Using this Guide

This guide provides the most efficient way to set up your CoreModule™ 800 SBC (single board computer). The instructions provided in this guide include:

- Removing the CoreModule 800 from the shipping container and inventorying the accessories

- Connecting cables to the CoreModule 800 SBC

- Connecting the I/O Board, Cable Adapter Board, peripherals, boot devices, and power supply to the CoreModule

- Powering up the CoreModule 800 SBC

Information not provided in this QuickStart Guide includes:

- CoreModule 800 Specifications

- Environmental requirements

- CoreModule 800 connector/pin numbers and definitions

- Supplied software use and programming considerations

Requirements

The following peripherals and boot devices are not provided in the QuickStart Kit, but are needed to make full use of the CoreModule 800.

- Peripherals (Customer provided):
    - PS/2 Keyboard
    - PS/2 Mouse
    - CRT (VGA) Monitor

- Power Supply (Customer provided):
    - AT or +5V lab power supply – Typically, an AT power supply is required to provide power to the CoreModule 800 and its associated peripherals.

- Boot Devices (one or more - Customer provided):
    - Floppy Disk drive
    - CD-ROM
    - IDE hard disk drive

- Optional Devices/Connections (Customer provided):
    - LVDS Flat Panel
    - Ethernet connection (Ampro provided (RJ-45) board with magnetics)
    - USB devices

What's in the Box

Refer to the QuickStart Kit Contents Sheet for a list of the items in the shipping container.

Setup Steps

It is important to follow the setup steps in this section in the exact order listed here, but skip any steps that do not apply to your situation. References are provided to chapters within this guide or other Ampro guides, for more information about installation and use of this CoreModule 800.

Preparation

1) Open shipping box	• Locate the QuickStart Kit Contents Sheet • Unpack the contents of the shipping box
2) Verify Contents	• Verify the contents of the shipping box against the QuickStart Contents Sheet included with your CoreModule 800 shipping box. • If anything is missing or damaged, call your sales representative or Tech Support.
3) Support Documentation (CoreModule 800 Documentation and Support Software CD-ROM)	*CoreModule 800 QuickStart Guide* This document describes how to setup, install, and power up the CoreModule 800 found in the QuickStart Kit and is provided on the CoreModule 800 Documentation and Support Software (Doc & SW) CD-ROM as a PDF file.
	CoreModule 800 Reference Manual This document describes the CoreModule 800 and provides detailed reference information for your CoreModule 800 and is located on the CoreModule 800 Documentation and Support Software (Doc & SW) CD-ROM as a PDF file.

Setting Up the Workspace

CAUTION	To prevent damage to the CoreModule 800 SBC, do not handle the board until you have followed good Electrostatic Discharge precautions. Always touch a grounded, unpainted metal surface before touching the CoreModule 800 SBC or any of the components on the board. Always use an anti-static wrist strap connected to a grounding mat, which has static-dissipating characteristics and attached to earth ground.

4) Select workbench location	• The workbench location should have a non-conductive, static-free mat (or the equivalent) to place the CoreModule 800, I/O Interface Board, and I/O Cable Adapter Board on for setup and operation (including the connection of the power supply, peripherals, and support devices).
5) Connect an ESD strap to your body	• Connect an ESD strap between your body (wrist or ankle) and ground on the static-free mat. If you do not have your own ESD strap, an ESD kit is provided in the QuickStart Kit with an anti-static wrist strap.
6) Unpack CoreModule 800	• Remove the CoreModule 800 from its protective plastic case and place it on a non-conductive, static-free work surface. • Remove the I/O Interface Board (I/O Board) and the I/O Cable Adapter Board (I/O Adapter) from the respective protective container (usually in the cable bag) and place each one on a non-conductive, static-free work surface.

Connecting Cables to the CoreModule 800

Connect the cables provided with the CoreModule 800 QuickStart Kit to the respective connectors on the CoreModule 800 SBC. Skip any cable(s) that do not apply to your situation.
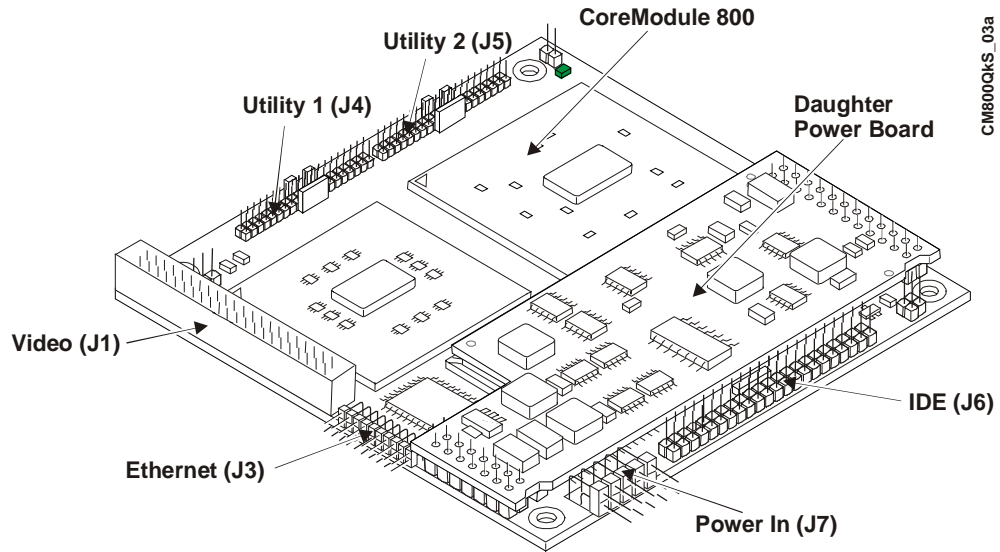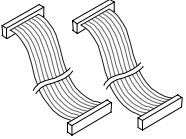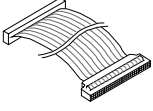
Figure 1-1. CoreModule 800 Connector Locations
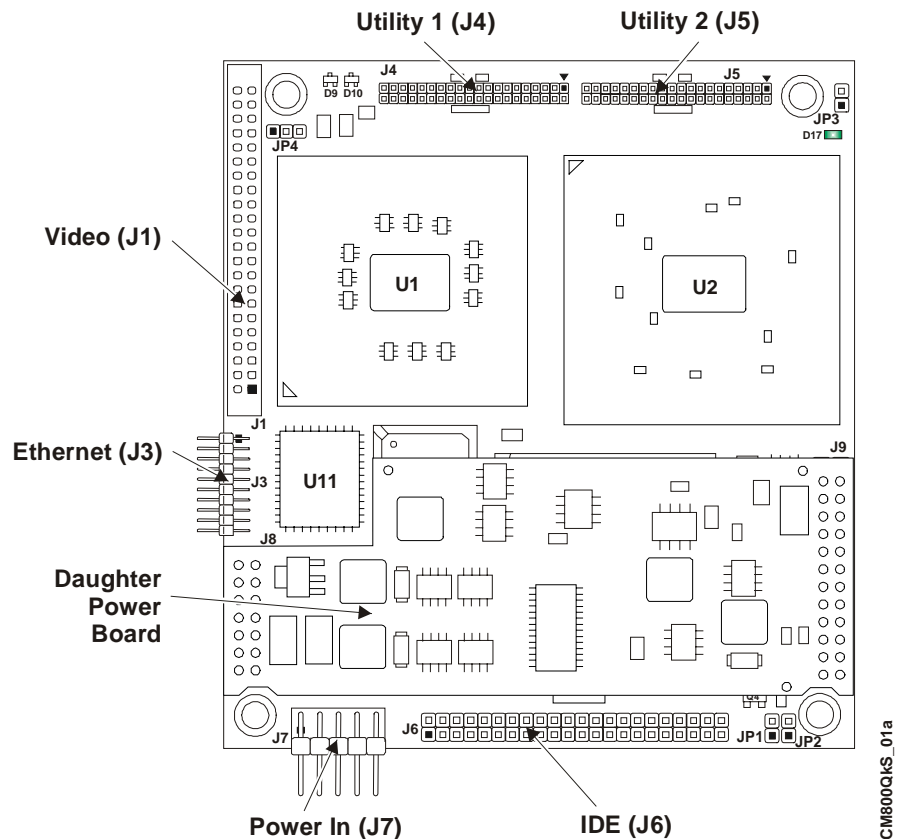
Figure 1-2. Connector and Pin-1 Locations

NOTE	Pin-1 is shown as a black pin (square or circle) in all connectors and jumpers in all illustrations. A small arrow head may also indicate pin-1.

Skip any steps that do not apply to your situation.	
1) Connect Utility 1 & 2 Cables	• Connect Utility 1 cable to J4 on the CoreModule 800 as shown in Figure 1-3. • Connect Utility 2 cable to J5 on the CoreModule 800 as shown in Figure 1-3. Utility 1 and 2 cables are identical and can be interchanged.
2) Connect IDE cable	• Connect the IDE cable to J6 on the CoreModule 800 as shown in Figure 1-3.
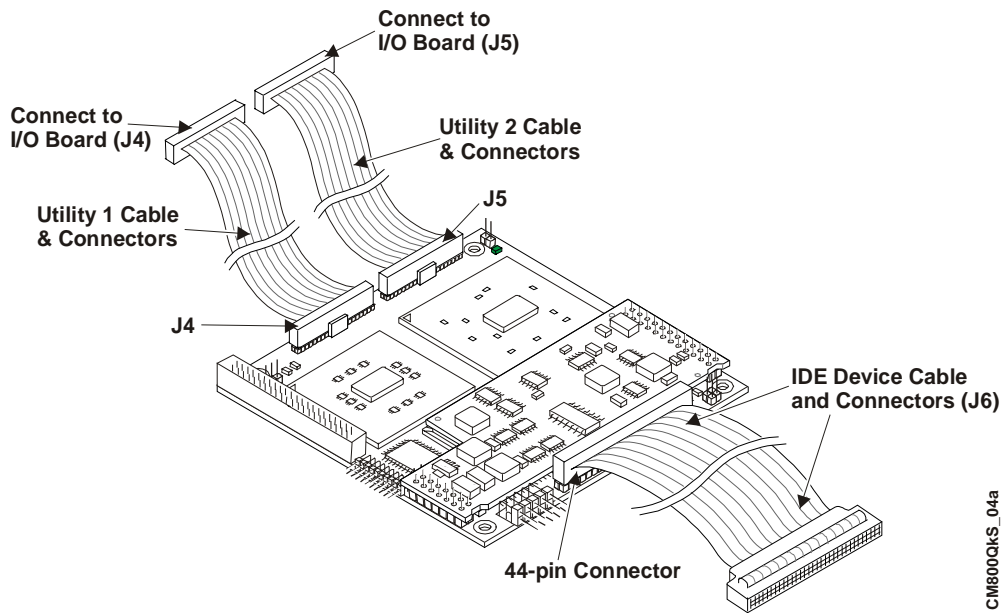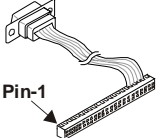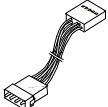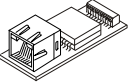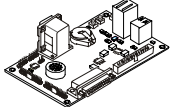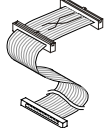
Figure 1-3. Connecting the IDE and Utility Cables
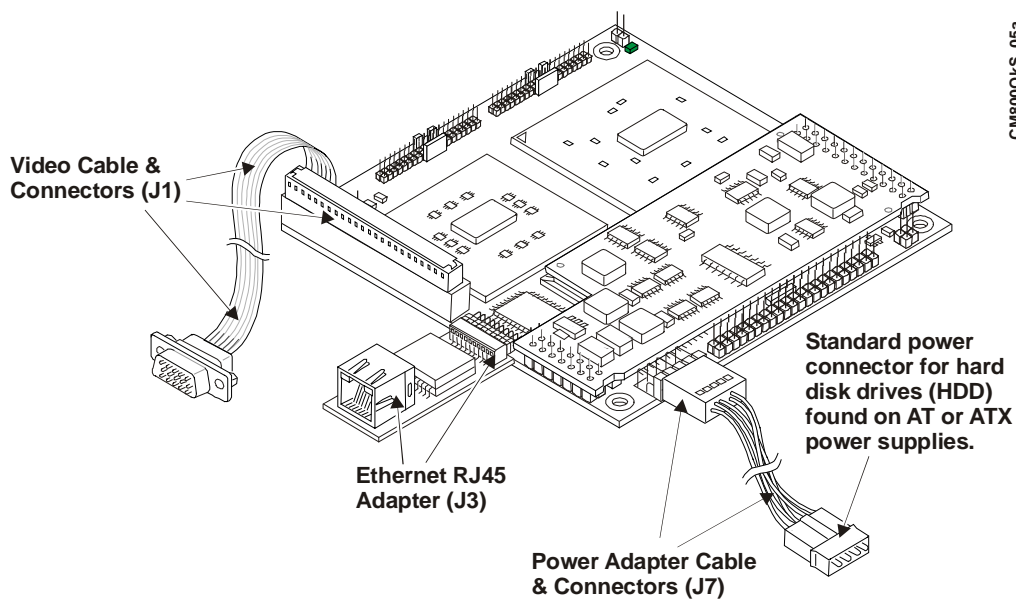
Figure 1-4. Connecting Video, Ethernet and Power Cables/Adapter

3) Connect the Video Cable	• Connect the Video cable to the Video connector (J1) on the CoreModule 800 as shown in Figure 1-4.
4) Connect Power Adapter Cable	• Connect the Power Adapter Cable to the Power In connector (J7) on the CoreModule 800 as shown in Figure 1-4. See Table 1-2 for Power Adapter Cable wiring and pin connections.
5) Connect the Ethernet Adapter board	• Connect the Ethernet adapter board provided in the QuickStart Kit to the Ethernet connector (J3) on the CoreModule 800 as shown in Figure 1-4. Refer to the *CoreModule 800 I/O Interface Design Library* on the CoreModule 800 Doc & SW CD-ROM for more information.
6) Connect Utility Cables 1 & 2 to the I/O Board	• Connect free end of Utility 1 Cable on the CoreModule 800 to J4 on the I/O Board as shown in Figures 1-5 and 1-6. • Connect free end of Utility 2 Cable on the CoreModule 800 to J5 on the I/O Board as shown in Figures 1-5 and 1-6.
7) Connect Floppy Drive Cable	• Connect a standard 34-pin Floppy drive cable to the Floppy drive port (J11) on the I/O Board. The floppy drive interface (J11) is shared with the Parallel (LPT1) interface (J12), so you can only use one of these connectors at a time on the I/O Board.

I/O Interface Board
(I/O Board)

Utility 1a (J4)

Connect Utility 1 cable
between J4 (Utility 1) on
CoreModule 800 and
J4 (Utility 1a) on
the I/O Board.

Floppy Disk
Drive (FDD)
Interface (J11)

Utility 2a (J5)

Connect Utility 2 cable between
J5 (Utility 2) on CoreModule 800 and
J5 (Utility 2a) on the I/O Board.
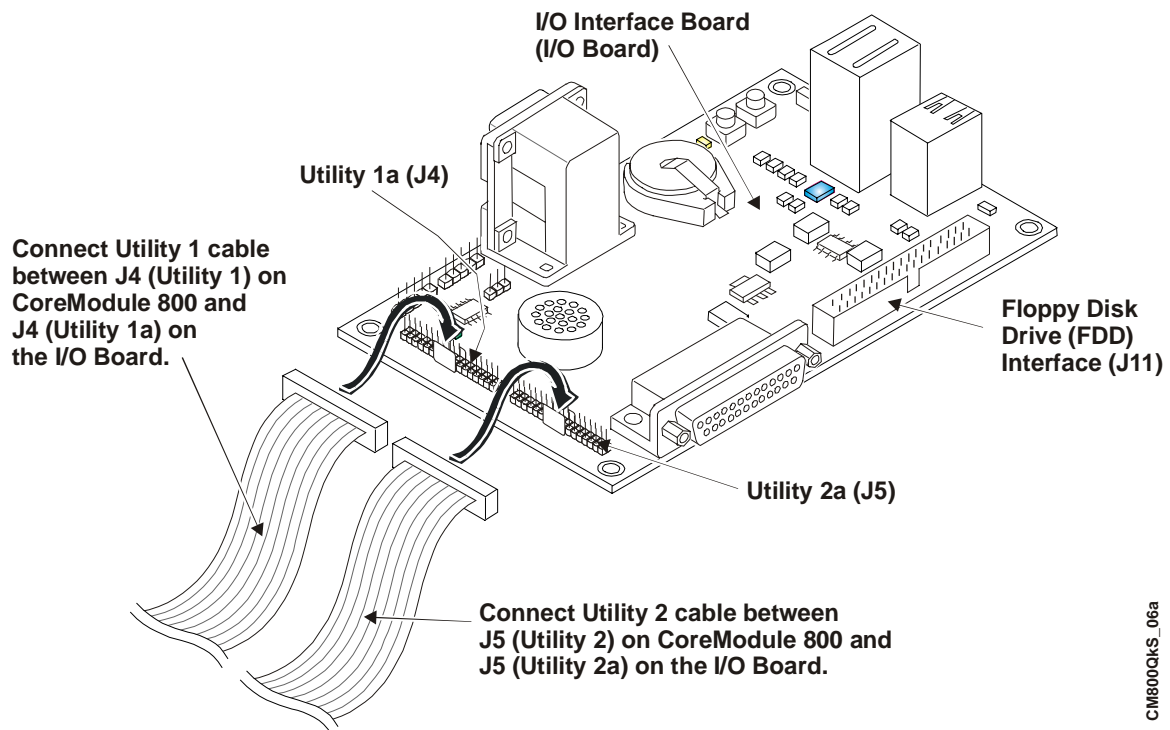
CM800QkS_06a

Figure 1-5. Connecting Utility Cables to the I/O Interface Board

I/O Interface Board
(I/O Board)

Utility 1a
Connector (J4)

Utility 1 Cable
connected between
J4 on I/O Board
and J4 on
CoreModule 800

Utility 2a
Connector (J5)

Utility 2 Cable connected
between J5 on I/O Board
and J5 on CoreModule 800

Floppy Disk Drive
(FDD) Cable &
Connectors (J11)

Utility 2
Connector (J5)

Utility 1
Connector (J4)

Video Cable &
Connectors (J1)

IDE Cable &
Connectors (J6)
(Second IDE
connector not
shown for
simplicity.)

CoreModule 800

Ethernet (RJ45)
Adapter Board (J3)

Power In
Cable &
Connectors (J7)

CM800QkS_07a

Figure 1-6. Complete CoreModule 800 Cable Assembly

Power Button
Switch (SW1)

PS/2 Keyboard/Mouse
(J9A/B)

Serial Ports
1 & 2 (J7A/B)

Reset Switch
(SW2)

USB Ports
0 & 1 (J8A/B)

Serial TX/TTL
Jumper (JP1)

SMBus (J10)

Floppy Disk
Drive (FDD)
Interface (J11)

Utility 1a (J4)

Parallel (LPT1)
Port (J12)

Utility 2a (J5)

I/O Interface Board
(I/O Board)

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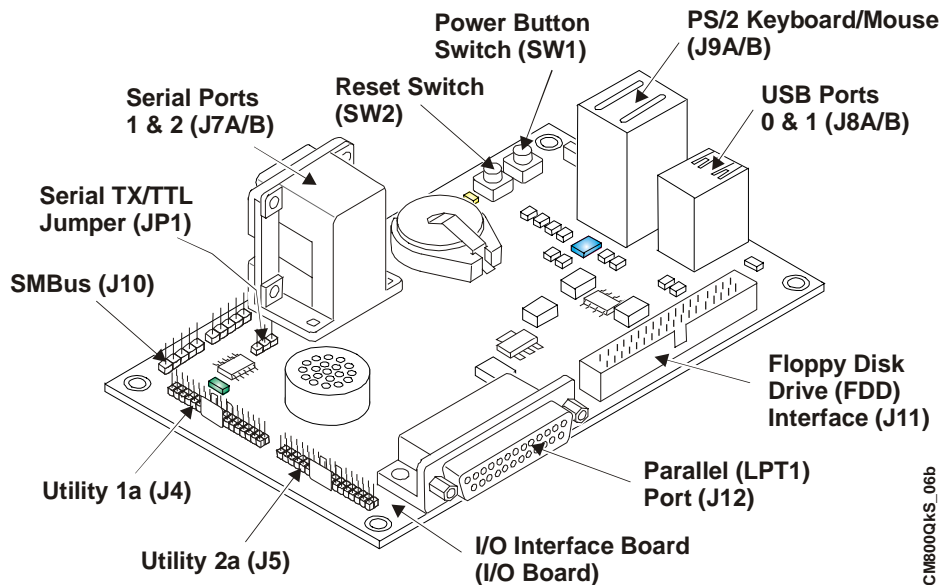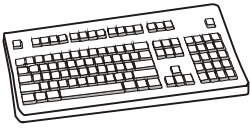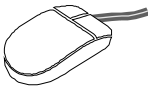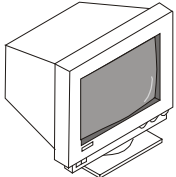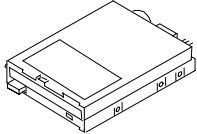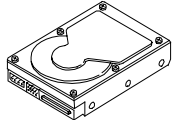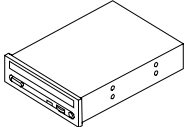
Figure 1-7. I/O Interface Board Connections

Connecting Peripherals

8) Connect peripheral I/O devices to the I/O Board.	This includes the keyboard, mouse, and CRT.
	Skip any devices that are not applicable to your situation.
	• Connect the keyboard to the keyboard connector (J9A) on the I/O Board (lower connection).
	Or, Connect a USB keyboard to one of the USB ports on the I/O Board.
	• Connect the mouse to the PS/2 connector (J9B) on the I/O Board.
	Or, Connect a USB mouse to one of the USB ports on the I/O Board.
	• Connect the CRT (VGA) monitor cable to the standard 15-pin Video connector from J1 on the CoreModule 800.
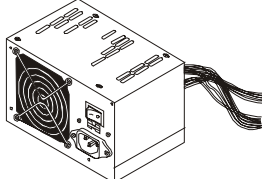
Connecting Boot Devices

9) Connect OS boot device (s)	• There are four device options for connecting an (OS) boot device to the CoreModule 800:
	a. Connect a floppy disk drive (FDD) to the floppy drive cable on the floppy port connector (J11) on the I/O Board. See Step 7.
	Or, Connect a USB floppy drive to one of the USB ports on the I/O Board.
	b. Connect an IDE hard disk drive (HDD) to one of the free connectors on the IDE cable from J6 on the CoreModule 800.
	• Ampro does not recommend using a preinstalled OS on a hard disk drive to boot and load the operating system. See Note with Step 21.
	Or, Connect a USB hard disk drive to one of the USB ports on the I/O Board.
	c. Connect a CD-ROM drive to the available connector on the IDE cable from J6 on the CoreModule 800.
	Or, Connect a USB CD-ROM drive to one of the USB ports on the I/O Board (USB0 is lower connector).
Ethernet Connection	d. Connect an Ethernet cable to Ethernet port (J3) for the PXE server, if you are using the LAN Boot feature. Refer to Steps 17, 18, 19d, 19e, 19f and the LAN Boot Note at the end of this chapter.
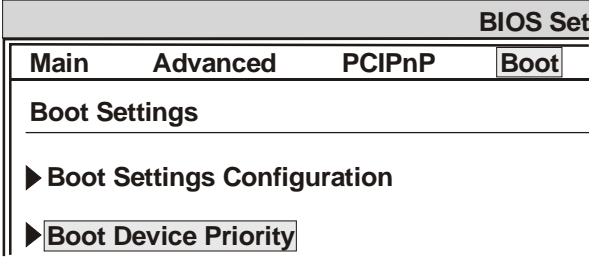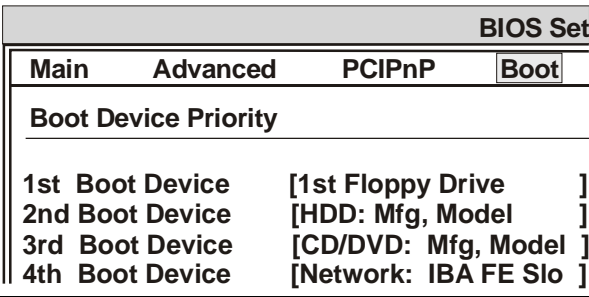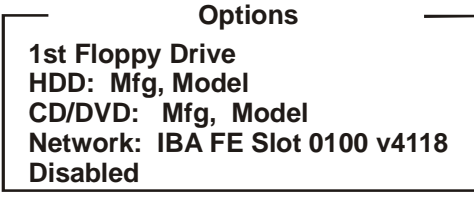
NOTE	For the most current Hardware and BIOS Information, refer to the CoreModule 800 Hardware Release Notes provided as hard copy in the shipping container.

Connecting the Power Supply

12) Connect the Power Supply	• Connect the AT power supply to the power adapter cable connected to J7 on the CoreModule 800. The available connector mates with the standard power connectors used for hard disk drives on AT or ATX power supplies.
13) Connect all support devices to the power supply	• Ensure all of the support devices you have plugged into the connectors (except the CRT (VGA) from the CoreModule 800 have good power connections to the AT power supply.
14) Check/Set jumper settings	• Check or set the jumpers on the CoreModule 800 and the I/O Board. Refer to Table 1-1 and Figure 1-8 for CoreModule 800 jumper settings. Refer to Table B-1 and Figure B-1 for the I/O Board settings.

Applying Power to the CoreModule 800

15) Check/Set the Power Supply Input Voltage	• If the power supply uses auto-ranging operation at 50/60 Hz, skip this step. • Check the input voltage switch on the power supply located on the rear of the supply just below the power connector. The input voltage switch typically has two positions: 115 or 230 volts – 115 volts is typically the default position.
16) Power up the CoreModule 800	a. Plug the CRT monitor's power cord into an AC outlet and turn on the monitor. b. Plug the AT power supply's power cord into the AC outlet. c. Turn the AT power supply's power switch to On before continuing.
17) Verify the CoreModule 800 powers-up satisfactorily	• Verify the CoreModule 800 passes POST successfully • If a bootable device, the LAN Boot image, or the desired operating system is not loaded on one of the boot devices (floppy drive or CD-ROM) prior to power up, you will see an error message *Reboot and Select proper Boot device, or Insert Boot Media in selected Boot device and press a key* near the end of the boot process. The boot process stops until you intervene, by selecting from: ♦ Reboot the system and go to Step 18 (Enter BIOS Setup), **or** a. Turn off the power switch on the power supply. b. Connect a bootable device to the CoreModule 800, reapply power to the system, which reboots the system, and then skip to Step 18 or 20. **NOTE** Ampro does not recommend using a hard disk drive with a preinstalled OS from another model computer to boot the CoreModule 800. This has proven to cause problems or provide unreliable operation. Use a bootable device (floppy or CD-ROM) to load the desired OS onto the hard drive and then the drivers, while attached to the Core Module 800. See Step 20.

18) Enter BIOS Setup	• Press the <Del> key early in the boot process to enter BIOS Setup. • Use BIOS Setup during the initial boot to set the desired options (time and date, alter the boot order for the floppy drive, CD-ROM, hard disk drive, or select Network: (LAN Boot), etc.). • Refer to Step 19 to alter the boot sequence, while in BIOS Setup.
19) Alter Boot Order, only if needed.	• If you need to alter the boot sequence to select a bootable device, use the sub-steps listed here and refer to the Hardware Release Notes.
The sub-steps listed here show you how to change the Boot Sequence while in the BIOS Setup Utility. a) Select the *Boot* menu and scroll down to *Boot Device Priority* as shown in the figure to the right.	**BIOS Set** **Main** **Advanced** **PCIPnP** **Boot** **Boot Settings** ▶ **Boot Settings Configuration** ▶ **Boot Device Priority**
b) Press <Enter> on *Boot Device Priority* and a menu similar to the one shown to the right appears. This example assumes 1st Boot Device is a 3 ½" floppy drive, 2nd Boot Device is an IDE HDD, 3rd Boot Device is an IDE CD-ROM, and the 4th Boot Device is Network (Ethernet - LAN Boot).	**BIOS Set** **Main** **Advanced** **PCIPnP** **Boot** **Boot Device Priority** **1st Boot Device** **[1st Floppy Drive]** **2nd Boot Device** **[HDD: Mfg, Model]** **3rd Boot Device** **[CD/DVD: Mfg, Model]** **4th Boot Device** **[Network: IBA FE Slo]**
c) Scroll to 1st Boot Device and press <Enter> key. The Options list appears with all of the connected devices listed in the menu similar to the one shown to the right.	**Options** **1st Floppy Drive** **HDD: Mfg, Model** **CD/DVD: Mfg, Model** **Network: IBA FE Slot 0100 v4118** **Disabled**
d) To move the CD-ROM up in the Boot Order. 	**NOTE**	You can also use the F11 key early in the Boot process to access the BBS (BIOS Boot Specification) popup menu to change the boot order. Follow the instructions on screen.		• Scroll down to *CD/DVD: Mfg, Model* and press the <**Enter**> key. The CD-ROM swaps place with the 1st Floppy Drive, putting the CD-ROM, or any device you select, including Network, in the 1st Boot Device position, while putting the 1st Floppy Drive in the 3rd Boot Device position. • If you select *Disabled*, the 1st Floppy Drive moves to the 4th position (last), labeled *Disabled*, while all other devices move up in the Boot order. • For more information, refer to the BIOS Chapter in the CoreModule 800 Reference Manual.
e) Check settings, Save Changes and Exit (This step reboots the system).	• Check the other settings in the BIOS before exiting BIOS Setup to save changes. • If you are using the LAN Boot feature, refer to the step f.

f) For LAN Boot, go to PXE Boot Agent BIOS Setup after rebooting	• Enter PXE BIOS by pressing **Ctrl** + **S**, when you see the following prompt appear on screen: *Initializing Intel (R) Boot Agent FE v4.x.xx* *PXE v2.0 Build 084 (WfM 2.0)* ***Press Ctrl + S to enter the setup Menu..*** • Make the necessary changes in the PXE BIOS Setup before saving changes. Refer to Appendix C of the CoreModule 800 Reference Manual for more information.
20) Install the desired Operating System (OS)	• Use the LAN Boot feature to load the boot (OS) image onto the hard disk drive, or other media. (See Note below) **Or** • Locate the desired Operating System (OS) diskette(s) or CD-ROM and follow the manufacturer's instructions for installing the OS and the necessary drivers. For Windows Operating Systems, most of the necessary drivers are found on the manufacturer's installation CD-ROM. For non-Windows Operating Systems, some or all of the necessary drivers may be found on the manufacturer's diskette(s) or CD-ROM. • If you require drivers that are not available on the OS manufacturer's diskette(s) or CD-ROM, refer to ***Installing Software, Drivers, and Utilities*** in Chapter 2 and the software subdirectory on the CoreModule 800 Doc & SW CD-ROM for the files and instructions.

NOTE	The CoreModule 800 ships from the factory configured only for CRT support. Ampro provides LCD/TFT support for flat panels with specific resolutions. Refer to the CoreModule 800 Reference Manual, the Release Notes, and Virtual Technician at http://ampro.custhelp.com for instructions and additional information when customizing the BIOS to a particular flat panel.

NOTE	LAN Boot Feature – The LAN Boot process puts the Ethernet connection at the top of the boot order, but it requires more than just selecting the correct BIOS Setup options. You will also need a PXE server with its tools and utilities, which Ampro does not provide. For the PXE BIOS settings and more information refer to Appendix C of the CoreModule 800 Reference Manual.

See Figures 1-1, 1-2, and 1-8 for the CoreModule 800 jumper locations. For the I/O Board jumper settings refer to Table B-1 and Figures 1-7 and B-1 for the I/O Board jumper location.

Table 1-1. CoreModule 800 Jumper Settings

Jumper #	Installed	Removed/Enabled
JP1 – CMOS Normal/Clear	Clear (1-2)	Normal (Removed) **Default**
JP2 – Serial 2 RS-485 Termination	Enable Termination (1-2)	Disable Termination (Removed) **Default**
JP3 – Serial 1 RS-485 Termination	Enable Termination (1-2)	Disable Termination (Removed) **Default**
JP4 – LVDS Flat Panel Voltage Select	Enable +3.3V (pins 1-2) **(Default)**	Enable +5V (pins 2-3)

Notes: Jumpers (or shunts) use 2 mm spacing. A jumper that is removed may be placed on one of the jumper pins for safe keeping.
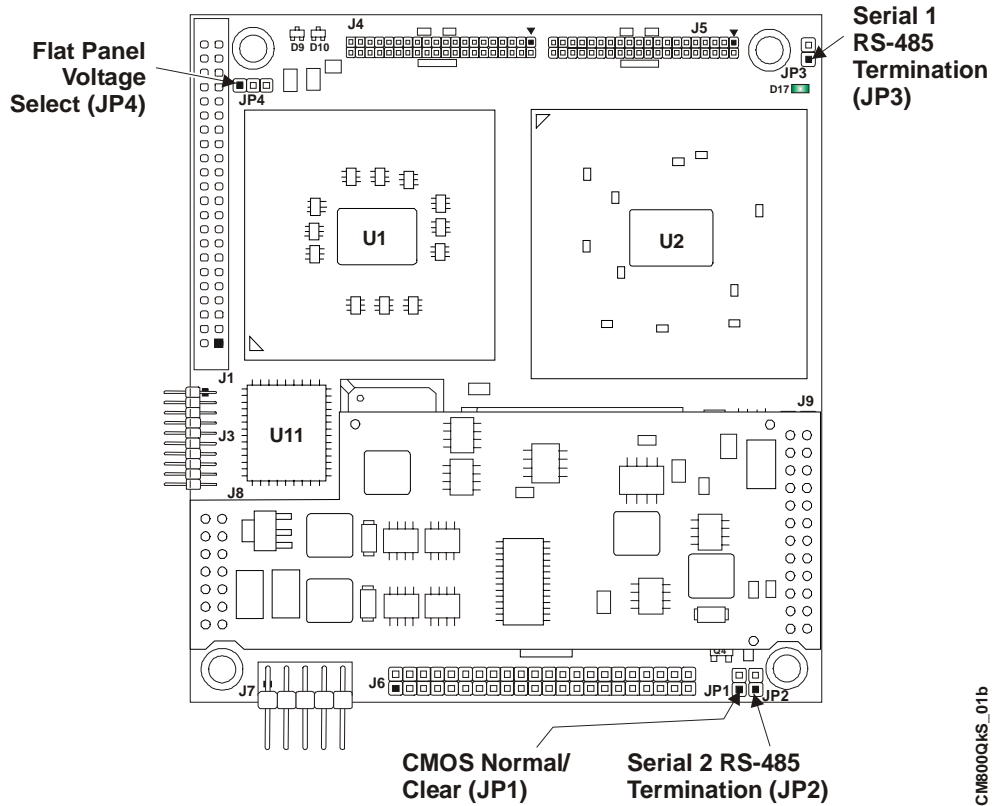
Figure 1-8. CoreModule 800 Jumper Locations

The power adapter cable is connected between the Power In connector (J7) and the power supply connector. See Steps 5 and 12.

Table 1-2. Power Adapter Cable Wiring

Wire Color	Four Pin #	To	Ten Pin #	Signal
Yellow	P-1	To	P-4	+12V
Black	P-2	To	P-1	GND
Black	P-3	To	P-7	GND
Black	P-3	To	P-9	GND
Red	P-4	To	P-2	+5V
Red	P-4	To	P-8	+5V
Red	P-4	To	P-10	+5V
–	–	–	P-3	Key

Note: The shaded area denotes power or ground.

Chapter 2   Installing CoreModule 800 Options

The procedures in the first part of this chapter describe how to install or remove the CoreModule 800 SBC (Single Board Computer) options onto or from the board, including the SODIMM card. Brief instructions for loading supported Operating Systems and accessing the CoreModule 800 Doc & SW (Documentation and Software) CD-ROM are also provided at the end of this chapter.

Memory Installation

The CoreModule 800 uses a single SODIMM socket available on the underside of the board. The CoreModule 800 supports PC 2700 DDR 333 (333 Mbps, 166 MHz) or PC 2100 DDR 266 (266 Mbps, 133 MHz), +2.5V, 200-pin, DDR RAM SODIMM.

NOTE	Ampro recommends using PC 2700 DDR 333 (333 Mbps, 166 MHz, 6 ns), +2.5V, 200-pin, DDR RAM SODIMM for maximum performance. The CoreModule will operate acceptably with a PC 2100 DDR 266 (266 Mbps, 133 MHz, 7.5 ns) SODIMM.

Tools Required

Use an anti-static service kit (or the equivalent) to remove or install the SODIMM. An anti-static service kit should include a static-dissipating work surface, a chassis clip lead, and a wrist or ankle strap.

Installation Guidelines

- When handling a SODIMM, observe anti-static discharge precautions to avoid damage.

- The CoreModule 800 uses PC 2700 DDR 333 (166 MHz) or PC 2100 DDR 266 (133 MHz), RAM SODIMMs, which are electrically different from SDR (Single Stroke) SODIMMs.

- The following DDR SODIMMs sizes are available from Ampro: 128 MB, 256 MB, 512 MB, or 1 GB.

- The CoreModule 800 supports up to 1 GB of memory in the SODIMM socket.

Removing the SODIMM

Use this procedure to remove the SODIMM from the SODIMM socket on the CoreModule 800.

1. Prepare the CoreModule 800 for SODIMM removal:

   ♦ If the CoreModule 800 is already prepared for SODIMM removal, with the power turned off, and the power cord disconnected, skip to Step 4.

   ♦ If the CoreModule 800 is operating, power down the system and continue with next step.

CAUTION	To prevent damage to the CoreModule 800 and the SODIMM, ensure the power switch on the AT or ATX power supply is turned off and the power cord has been removed from the AC power source. The typical ATX power supply will continue to provide standby current to the board until the power cord is disconnected.

2. Disconnect the ATX or AT power supply's power cord from the AC power source.

CAUTION	To prevent damage to the CoreModule 800 or the SODIMM, do not touch the either one until you have discharged yourself and have followed good Electrostatic Discharge principals. The CoreModule 800 and the SODIMM are sensitive to static electricity and can be easily damaged by improper handling. Do the following when handling either one:
	Use an anti-static wrist/ankle strap and a grounding mat connected to ground.
	Before you touch the CoreModule 800 or SODIMM, touch a grounded, unpainted metal surface to discharge any static electricity.

3. Disconnect any cables that would prevent you from turning the CoreModule 800 over exposing the bottom of the board.

4. Turn the CoreModule 800 over to access the bottom of the board and lay it on a flat anti-static surface. See Figures 2-1 and 2-2.

5. Locate the SODIMM socket (J22) on the bottom of the CoreModule 800. See Figure 2-1.
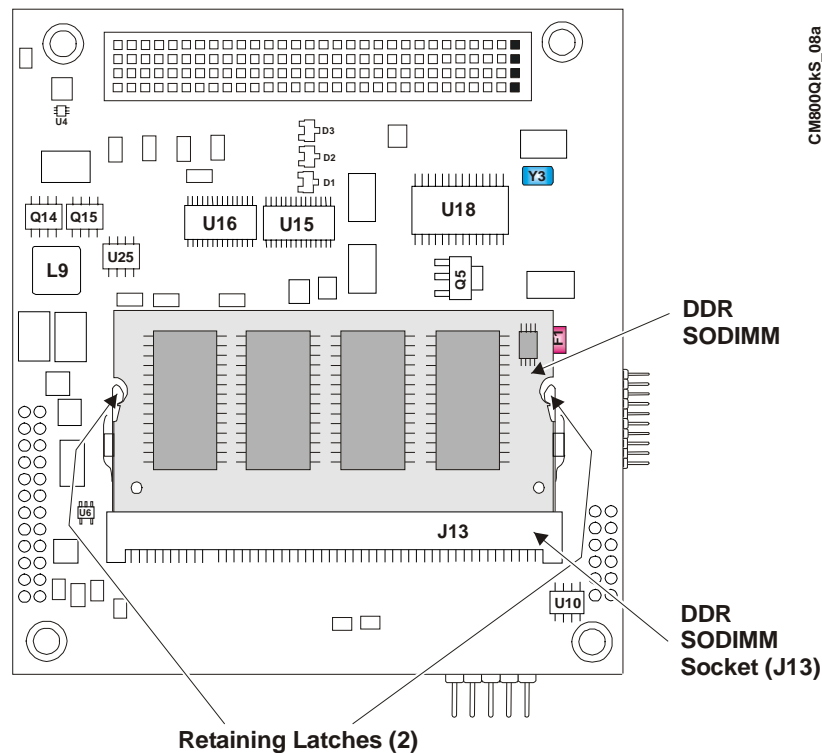
Figure 2-1. CoreModule 800 SODIMM Location (Bottom view)

6. Open both retaining latches to release the SODIMM from the socket. See Figure 2-1.

   The SODIMM will spring up to a 45° angle to the board once you open both retaining latches. If the SODIMM does not spring up to a 45° angle, then the retaining latches have not released the SODIMM from the socket. See Figure 2-2.

7. Using the card edges, lift the SODIMM completely away from the socket. See Figure 2-2.

8. Place the SODIMM on an anti-static surface or in an anti-static bag.

NOTE	If you remove the SODIMM and restore power without a SODIMM installed, you will not see a display and your system will not work properly.
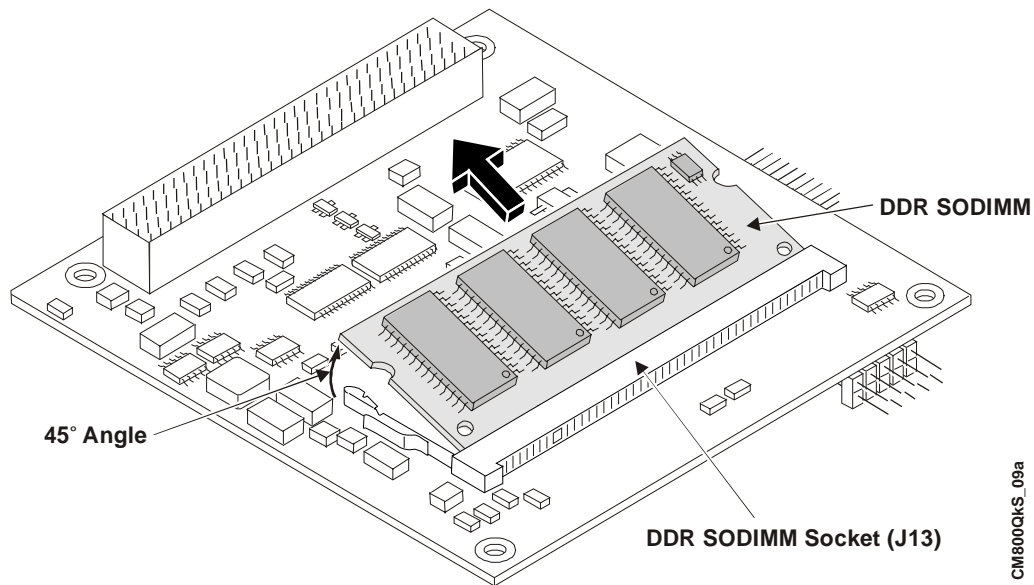
Figure 2-2. Removing SODIMM from Socket

Installing the SODIMM

If you want to install a different size SODIMM or replace the existing SODIMM, refer to the following procedure.

1. Prepare the CoreModule 800 for SODIMM installation:

    ♦   If the CoreModule 800 is already prepared for SODIMM installation, with the power turned off, the power cord disconnected, and an empty SODIMM socket, skip to Step 4.

    ♦   If the CoreModule 800 is operating, power down the system and continue with next step.

CAUTION	To prevent damage to the CoreModule 800 and the SODIMM, ensure the power switch on the power supply is turned off and the power cord has been removed from the power source. The typical ATX power supply will continue to provide standby current to the board until the power cord is disconnected.

2. Disconnect the ATX or AT power supply's power cord from the AC power source.

CAUTION	To prevent damage to the CoreModule 800 or the SODIMM, do not touch the either one until you have discharged yourself and have followed good Electrostatic Discharge principals. The CoreModule 800 and the SODIMM are sensitive to static electricity and can be easily damaged by improper handling. Do the following when handling either one:
	Use an anti-static wrist/ankle strap and a grounding mat connected to ground.
	Leave the SODIMM in the anti-static bag until you are ready to install it.
	Before you touch the CoreModule 800 or SODIMM, touch a grounded, unpainted metal surface to discharge any static electricity.

3. Disconnect any cables that would prevent you from turning the CoreModule 800 over exposing the bottom of the board.

---

4. Turn the CoreModule 800 over to access the bottom of the board and lay it on a flat anti-static surface. See Figures 2-1 and 2-3.

5. Remove the existing SODIMM from the SODIMM socket before continuing.

    Refer to the Step 4 in the proceeding procedure, *Removing the SODIMM*, and follow the remaining steps in that procedure before continuing with the next step in this procedure.

6. Remove the SODIMM from the anti-static surface or the protective bag, handling the SODIMM by the edges.

NOTE	Ampro recommends using PC 2700 DDR 333 (333 Mbps, 166 MHz, 6 ns), +2.5V, 200-pin, DDR RAM SODIMM for maximum performance. The PC 2100 DDR 266 (266 MBps, 133 MHz) SODIMM will operate acceptably.

7. Ensure there is nothing in the SODIMM socket that would prevent the installation.

8. Insert the SODIMM into the socket at 45° angle to the bottom of the CoreModule 800 with the components facing up. See Figure 2-3.

    The SODIMM card edge and socket are keyed to install into the socket in only one orientation.
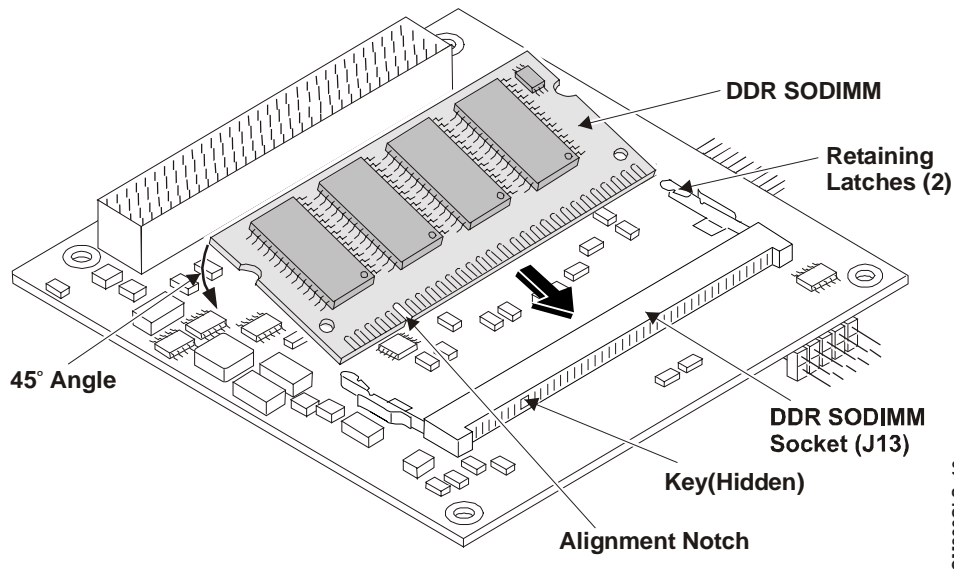
Figure 2-3. Inserting SODIMM into Socket

9. Press the edges of the SODIMM down between the latches, until the latches snap into place. See Figure 2-4.

    The latches should open to accept the SODIMM without any resistance. If you encounter any resistance, you may not have inserted the SODIMM far enough into the socket.

CM800QkS_11a

DDR SODIMM

Press down on SODIMM at both corners until you hear a snap.
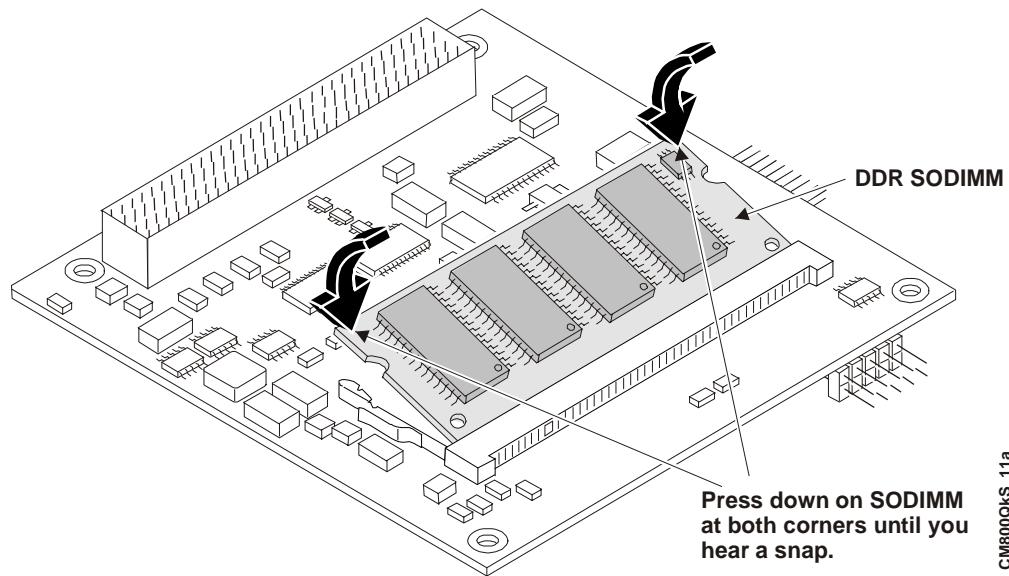
Figure 2-4. Pressing down on SODIMM

10. If the retaining latches do not close completely on the SODIMM, remove it and repeat Steps 7 to 9.

11. Turn the CoreModule 800 back over onto the bottom of the board, placing it on the work surface.

12. Reconnect any cables you disconnected earlier and verify all other connections to the CoreModule 800 are still connected.

13. Reconnect the ATX or AT power supply's power cord to the AC power source.

14. Restore power to the CoreModule 800 and observe the boot screen for new memory recognition.

     If the system does not boot or there is a problem recognizing the new memory, the new SODIMM could be defective or the SODIMM was not properly installed or recognized.

Installing Software, Drivers, and Utilities

To install the operating system and respective software drivers, refer to the following procedure.

1. Install the desired operating system (OS) and related drivers from the source files (LAN Boot) or from the manufacturer's diskette(s) or CD-ROM.

   ♦ If you are using the LAN Boot feature to load the boot (OS) image, skip the remaining Steps that do not apply.

   Follow the manufacturer's instructions to install the desired OS and respective drivers.

   ♦ For Windows Operating Systems, some of the necessary drivers may be found on the manufacturer's installation diskette or CD-ROM. If more software drivers are needed, refer to the CoreModule 800 Doc & SW CD-ROM.

   ♦ For other Operating Systems, some or all of the necessary drivers may be found on the manufacturer's installation diskette(s) or CD-ROM. If not, refer to the CoreModule 800 Doc & SW CD-ROM.

2. Run the CoreModule 800 Doc & SW CD-ROM to access the documentation, various utilities, and OS drivers not on the manufacturer's diskette(s) or CD-ROM.

   The CoreModule 800 Doc & SW CD-ROM will operate on any Windows PC, allowing you to view, download, or print the contents of the CD-ROM. This includes the:

   ♦ CoreModule 800 QuickStart Guide

   ♦ CoreModule 800 Reference Manual

   ♦ CoreModule 800 Software Release Notes

   ♦ Software drivers

   ♦ Various utilities and code examples

NOTE	You must have an Internet browser to view the main menu and make selections (examples: Microsoft Internet Explorer 4.x, or greater, Netscape Navigator version 4.x, or greater, or the equivalent on a PC). Software download links are provided for Adobe Acrobat Reader version 4.x or greater to view the manuals and documents.
	An Internet connection is required for the Adobe Acrobat link or access to the Ampro web site.

   The CoreModule 800 Doc & SW CD-ROM should auto-start, but if it does not, go to the root level of the CD-ROM and locate the index.htm by:

   a. Selecting Run from the Start menu in any Windows PC.

   b. Browsing the contents of the CD-ROM until you find the index.htm at the root level.

   c. Select this file and press OK to start the CD-ROM.

      The CD-ROM starts and opens the main menu of the CD-ROM.

3. Select from the directories as shown below:

   ♦ CoreModule 800 Documentation (CoreModule 800 Reference Manual, QuickStart Guide, Software Release Notes)

   ♦ CoreModule 800 Software (Supported operating system (OS) Board Support Packages (BSPs), drivers, and code examples)

   ♦ CoreModule 800 SBC Interface Design Library (includes the PCB layout, schematic, and BOM/AVL for I/O Interface board, and Ethernet Interface board).

There are directories and subdirectories under these topics that should provide you with the needed manuals, utilities, and tools not explained earlier.

4. Install any special OS drivers not found on the manufacturer's diskette(s) or CD-ROM.

    Refer to the directories and subdirectories on the CoreModule 800 Doc & SW CD-ROM for instructions when installing the drivers for the desired OS.

    If the desired drivers can not be found, contact Ampro through the Virtual Technician on the web site with a request for the driver(s). Refer to the Appendix A, Technical Support for more information.

5. Install any utilities or other development tools you may need from the CoreModule 800 Doc & SW CD-ROM.

    Refer to the directories on the CoreModule 800 Doc & SW CD-ROM for instructions on installing and using the utilities or development tools for the desired OS.

Appendix A   Technical Support

Ampro Computers, Inc. provides a number of methods for contacting Technical Support listed below in Table A-1. Requests for support through the Virtual Technician are given the highest priority, and usually will be addressed within one working day.

- Ampro Virtual Technician – This is a comprehensive support center designed to meet all your technical needs. This service is free and available 24 hours a day through the Ampro web site at http://ampro.custhelp.com. This includes a searchable database of Frequently Asked Questions, which will help you with the common information requested by most customers. This is a good source of information to look at first for your technical solutions. However, you must register online if you wish to use the "Ask a Question" feature.

- Personal Assistance – You may also request personal assistance by creating a Virtual Technical account and then going to the "Ask a Question" feature. Requests can be submitted 24 hours a day, 7 days a week. You will receive immediate confirmation that your request has been entered. Once you have submitted your request, you must log in to go to the "My Stuff" area where you can check status, update your request, and access other features.

- Embedded Design Resource Center – This service is also free and available 24 hours a day at the Ampro web site at http://www.ampro.com. However, you must be registered before you can login to access this service.

  The Embedded Design Resource Center was created as a resource for embedded system developers to share Ampro's knowledge, insight, and expertise gained from years of experience. This page contains links to White Papers, Specifications, and additional technical information.

Table A-1. Technical Support Contact Information

Method	Contact Information
Virtual Technician	http://ampro.custhelp.com
Web Site	http://www.ampro.com
Standard Mail	Ampro Computers, Incorporated 5215 Hellyer Avenue San Jose, CA 95138-1007, USA

Appendix B   I/O Interface Board

Overview

The I/O Interface Board (I/O Board) provides the I/O device connections and interface to the CoreModule 800 in the Utility connectors (J4, J5) on the I/O Interface Board.

The I/O Interface Board (I/O Board) provides the I/O connections for the keyboard, mouse, floppy/parallel port, serial ports (2) and USB ports (2). The I/O Board also provides the Infrared (IR) transceiver for IrDA connections, a battery socket with Lithium battery, PC "Beep" speaker, a reset switch and power on switch.

I/O Interface Board Layout
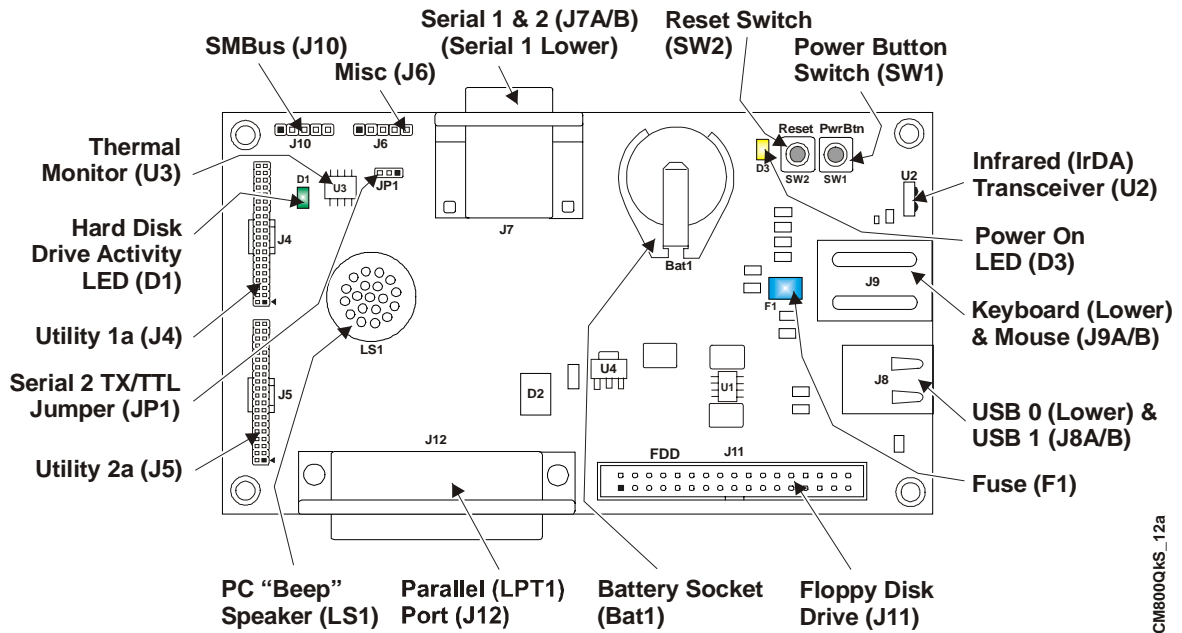
Figure B-1. I/O Interface Board Connectors (Top view)

NOTE	If you need more information concerning the I/O Board than is provided in this Appendix, refer to the I/O Interface Design Library on the CoreModule 800 Doc & SW CD-ROM for a schematic, BOM, and AVL.

Table B-1. I/O Interface Board Jumper (JP1) Settings

Jumper #	Installed	Removed/Enabled
JP1 – Serial 2 TX/TTL Jumper (onboard)	Normal (**Default**) TX signal (pins 1-2) to Serial Port 2 (J4-3)	TTL signal (pins 2-3) to Serial Port 2 (J4-3)

NOTE	Pin-1 is shown as a black pin (square or circle) in all connectors and jumpers in all illustrations. A small diamond may also indicate pin-1.

I/O Interface Board Connectors

Table B-2 lists the interface between Utility 1a (J4) and the other connectors/devices on the I/O Board.

Table B-2. Utility 1a Interface Pin/Signal Descriptions (J4)

J4 Pin #	Signal	Pin # On-board	Description
1	DCD0* (Serial 1/ COM1)	J7-1	Data Carrier Detect 0 – Indicates external serial device is detecting a carrier signal (i.e., a communication channel is currently open). In direct connect environments, this is be driven by DTR0 as part of the DTR0/DSR0 handshake.
2	DSR0*	J7-6	Data Set Ready 0 – Indicates external serial device is powered, initialized, and ready. Used as hardware handshake with DTR0 for overall readiness to communicate.
3	RXD0	J7-2	Receive Data 0 Input – This receive data line is typically held at a logic 1 (mark) when no data is being transmitted, and is held "Off" for a brief interval after an "On" to "Off" transition on the RTS0 line to allow the transmission to complete.
	RX0-		Receive Data 0 Negative – If in RS-485 mode, this pin is RX0-.
4	RTS0*	J7-7	Request To Send 0 – Indicates serial port is ready to transmit data. Used as hardware handshake with CTS0 for low level flow control.
	TX0+		Transmit Data 1 Positive – If in RS-485 mode, this pin is TX0+.
5	TXD0	J7-3	Transmit Data 0 Output – This line is typically held to a logic 1 when no data is being sent. A logic 0 (On) must be present on RTS0, CTS0, DSR0, and DTR0 before data can be transmitted on this line.
	TX0-		Transmit Data 0 Negative – If in RS-485 mode, this pin is TX0-.
6	CTS0*	J7-8	Clear To Send 0 – Indicates external serial device is ready to receive data. Used as hardware handshake with RTS0 for low level flow control.
	RX0+		Receive Data 0 Positive – If in RS-485 mode, this pin is RX0+.
7	DTR0*	J7-4	Data Terminal Ready 0 – Indicates port is powered, initialized, and ready. Used as hardware handshake with DSR0 for overall readiness.
8	RI0*	J7-9	Ring Indicator 0 – Indicates external serial device is detecting a ring condition. Used by software to initiate operations to answer and open the communications channel.
9	GND	J7-5	Digital Ground
10	PS_ON	SW1-3/ -4	Power Supply On –
11	DCD1* (Serial 2/ COM2)	J7-10	Data Carrier Detect 1 – Indicates external serial device is detecting a carrier signal (i.e., a communication channel is currently open). In direct connect environments, this input is driven by DTR1 as part of the DTR1/DSR1 handshake.
12	DSR1*	J7-15	Data Set Ready 1 – Indicates external serial device is powered, initialized, and ready. Used as hardware handshake with DTR1 for overall readiness.
13	RXD1	J7-11	Receive Data 1 Input – This line is typically held at a logic 1 (mark) when no data is being transmitted, and is held "Off" for a brief interval after an "On" to "Off" transition on the RTS1 line to allow the transmission to complete.

J4 Pin #	Signal	Pin # On-board	Description
14	RTS1*	J7-16	Request To Send 1 – Indicates serial port is ready to transmit data. Used as hardware handshake with CTS1 for low level flow control.
15	TXD1 (through JP1)	J7-12	Transmit Data 1 Output – This line is typically held to a logic 1 when no data is being sent. A logic 0 (On) must be present on RTS1, CTS1, DSR1, and DTR1 before transmitting data on this line.
16	CTS1*	J7-17	Clear To Send 1 – Indicates external serial device is ready to receive data. Used as hardware handshake with RTS1 for low level flow control.
17	DTR1*	J7-13	Data Terminal Ready 1 – Indicates port is powered, initialized, and ready. Used as hardware handshake with DSR1 for overall readiness to communicate.
18	RI1*	J7-18	Ring Indicator 1 – Indicates external serial device is detecting a ring condition. Used by software to initiate operations to answer and open the communications channel.
19	GND	J7-14	Digital Ground
20	S1_TXD	JP1-3	Serial Port 2 Transmit TTL – Places TTL TX signals on pin 3 of the Serial Port 2 (J4) when jumper (JP1) on I/O Board is set to pins 2-3.
21	USBOC0	J4-21	USB 0 Over Current – The Power Distribution Switch (U1) monitors power and disables port if this input is low.
22	USB Pwr	J4-22	USB Port 0 power (+5V +/-5%)
23	USBP0-	J4-23	Universal Serial Bus Port 0 Data Negative
24	USBP0+	J4-24	Universal Serial Bus Port 0 Data Positive
25	GND	J4-25	USB Ground
26	USBOC1	J4-26	USB 1 Over Current – The Power Distribution Switch (U1) monitors power and disables port if this input is low.
27	USB Pwr	J4-27	USB Port 0 power (+5V +/-5%)
28	USBP1-	J4-28	Universal Serial Bus Port 1 Data Negative
29	USBP1+	J4-29	Universal Serial Bus Port 1 Data Positive
30	GND	J4-30	USB Ground
31	MSDT	J4-31	Mouse Data
32	MSCK	J4-32	Mouse Clock
33	GND	J4-33	Ground
34	MSPwr	J4-34	Mouse Power (+5V +/-5%)
35	HDDAct	D1-1	IDE Hard Disk Drive Activity – IDE activity signal to HDD Activity LED (D1).
36	ExtSMI*	J6-2	External SMI – Provides external SMI signal to the CoreModule 800.
37	ThermDP	U3-3	Thermal Data Positive – Thermal data positive received from CPU.
38	BatLow*	J6-3	Battery Low –
39	ThermDN	U3-4	Thermal Data Negative – Thermal data negative received from CPU.
40	NC	J4-40	Not Connected (External –5V input)

Notes: The shaded area denotes power or ground. The signals marked with * = Negative true logic.
NC = Not Connected at CoreModule 800.

Table B-3 lists the interface between Utility 2a (J5) and the other connectors/devices on the I/O Board.

Table B-3. Utility 2a Interface Pin/Signal Descriptions (J5)

J5 Pin #	Signal	OnBoard Pin #	Description
1	STB*	J12-1	Parallel Strobe* – Output used to strobe data into the printer. I/O pin in ECP/EPP mode.
	NC	J11-14	Not connected (DS0 – Drive Select 0)
2	AFD*	J12-2	Parallel Auto Feed – This is a Request signal sent to the printer to automatically feed one line after each line is printed.
	DEN0	J11-2	Floppy Drive Density Select Bit 0 – This signal indicates a low (250/300 kbps) or high (500 kbps) data rate has been selected.
3	PD0	J12-3	Parallel Data 0 – These signals (0 to 7) provide the parallel port data to the printer.
	INDEX*	J11-8	Floppy Index – Sense detects the head is positioned over the beginning of a track
4	ERR*	J12-4	Parallel Error – This is a Status output signal from the printer. A Low State indicates an error condition on the printer.
	HDSel*	J11-32	Floppy Head Select – Selects FDD side for Read/Write operations (0 = side 1, 1 = side 0)
5	PD1	J12-5	Parallel Data 1 – Refer to PD0, pin 3, for more information.
	TRK0	J11-26	Floppy Track 0 – Sensor detects the head is positioned over track 0.
6	PInit*	J12-6	Parallel Initialize – This signal used to Initialize printer. Output in standard mode, I/O in ECP/EPP mode.
	DIR*	J11-18	Floppy Direction – Direction of floppy head movement (0 = inward motion, 1 = outward motion).
7	PD2	J12-7	Parallel Data 2 – Refer to PD0, pin 3, for more information.
	WrtPrt*	J11-28	Floppy Write Protect – Senses the diskette is write protected.
8	SLIn*	J12-8	Parallel Select In – This signal used to select the printer. I/O pin in ECP/EPP mode.
	STEP*	J11-20	Floppy Step – Low pulse for each track-to-track movement of the head.
9	PD3	J12-9	Parallel Data 3 – Refer to PD0, pin 3, for more information.
	RData*	J11-30	Floppy Read Data – Raw serial bit stream from the drive for read operations.
10	SMB_ Alert	U3-11	SMBus Alert – This pin receives signals from thermal monitor (U3).
		J10-3	SMBus Alert – This pin sends/receives to/from external devices.
11	PD4	J12-11	Parallel Data 4 – Refer to PD0, pin 3, for more information.
	DskChg*	J11-34	Floppy Disk Change – Senses the drive door is open or the diskette has been changed since the last drive selection.
12	GND	GND	Ground
13	PD5	J12-13	Parallel Data 5 – Refer to PD0, pin 3, for more information.
14	GND	GND	Ground
15	PD6	J12-15	Parallel Data 6 – Refer to PD0, pin 3, for more information.
	NC	J11-10	Not Connected (MTR0 – Motor Control 0)
16	GND	GND	Ground

J5 Pin #	Signal	OnBoard Pin #	Description
17	PD7	J12--17	Parallel Data 7 – Refer to PD0, pin 3, for more information.
18	GND	GND	Ground
19	ACK*	J12-19	Parallel Acknowledge – Status output signal from the printer. A Low State indicates it data received and is ready to accept new data.
	DS1	J11-12	Floppy Drive Select 1 – Selects drive 1.
20	GND	GND	Ground
21	BSY	J12-21	Parallel Busy – Status output signal from the printer. A High State indicates the printer is not ready to accept data.
	MTR1*	J11-16	Floppy Motor Control 1 – Selects motor on drive 1.
22	GND	GND	Ground
23	PE	J12-23	Parallel Paper End – Status output signal from the printer. A High State indicates it is out of paper.
	WData*	J11-22	Floppy Write Data – Encoded data sent to drive for write operations.
24	GND	GND	Ground
25	Slct	J12-25	Parallel Select – Status output signal from the printer. A High State indicates it is powered on.
	Wgate*	J11-24	Floppy Write Gate – Enables drive current flow in the write head.
26	IRFIRM	J6-5	Infrared Function Mode Select – To external device from J6-5.
27	PM_Sus Clk	J6-4	Power Management Suspend Clock –
28	GND	GND	Ground
29	IRTX	U2-7	IR Transmit Data – To infrared transceiver TX pin (U2, HSDL-3200)
30	IRRX	U2-6	IR Receive Data – To infrared transceiver TX pin (U2, HSDL-3200)
31	SPKR+	LS1-1	Speaker + Drive – To positive terminal on *Beep* Speaker (LS1)
32	GND	GND	Ground
33	RstSW	SW2-3/4	Reset Switch – Puts ground on this pin when pressed.
34	PwrBtn	SW1-3/4	Power On Switch – Puts ground on this pin when pressed.
35	KBDT	J9-A1	Keyboard Data signal
36	KBCK	J9-A6	Keyboard Clock signal
37	GND	GND	Digital Ground
38	VCC	VCC	+5V +/-5%
39	BATV+	BAT1-1	Battery + Voltage – To + terminal on Battery socket (BAT1).
40	GND	GND	Ground

Notes: The shaded area denotes power or ground. The signals marked with * = Negative true logic.

Table B-4 lists the connections on the I/O Board between the Serial Port 1 connector (J7) and the Utility 1Connector (J1).

Table B-4. Serial Port 1 Interface Pin/Signal Descriptions (J7B)

J7 Pin #	Signal	From Onboard Connector & Pin #	Description
1	DCD1*	J4-1	Data Carrier Detect 1 – Indicates external serial device is detecting a carrier signal (i.e., a communication channel is currently open). In direct connect environments, this input is driven by DTR1 as part of the DTR1/DSR1 handshake.
2	RXD1 RX1-	J4-3	Receive Data 1 Input – This line is typically held at a logic 1 (mark) when no data is being transmitted, and is held "Off" for a brief interval after an "On" to "Off" transition on the RTS1 line to allow the transmission to complete. Receive Data 1 Negative – If in RS485 mode, this pin is RX1-.
3	TXD1 TX1-	J4-5	Transmit Data 1 Output – This line is typically held to a logic 1 when no data is being sent. Typically, a logic 0 (On) must be present on RTS1, CTS1, DSR1, and DTR1 before data is transmitted on this line. Transmit Data 1 Negative – If in RS485 mode, this pin is TX1-.
4	DTR1*	J4-7	Data Terminal Ready 1 – Indicates port is powered, initialized, and ready. Used as hardware handshake with DSR1 for overall readiness.
5	GND	J4-9	Ground
6	DSR1*	J4-2	Data Set Ready 1 – Indicates external serial device is powered, initialized, and ready. Used as hardware handshake with DTR1 for overall readiness to communicate.
7	RTS1* TX1+	J4-4	Request To Send 1 – Indicates serial port is ready to transmit data. Used as hardware handshake with CTS1 for low level flow control. Transmit Data 1 Positive – If in RS485 mode, this pin is TX1+.
8	CTS1* RX1+	J4-6	Clear To Send 1 – Indicates external serial device is ready to receive data. Used as hardware handshake with RTS1 for low level flow control. Receive Data 1 Positive – If in RS485 mode, this pin is RX1+.
9	RI1*	J4-8	Ring Indicator 1 – Indicates external serial device is detecting a ring condition. Used by software to initiate operations to answer and open the communications channel.

Notes: The shaded area denotes power or ground. The signals marked with * = Negative true logic.

To implement the two-wire RS485 mode on either serial port, you must tie the equivalent pins together for each port.

For example; on Serial Port 1, tie pin 2 (RX1-) to 3 (TX1-) and pin 7 (TX1+) to 8 (RX1+) at the (DB9) Serial 1 port connector (J7) as shown in Figure B-2. Refer to either table for the specific pins on the port connectors. The RS-422 mode uses a four-wire interface and does not need any pins tied together, but you must select RS-485 in BIOS Setup.
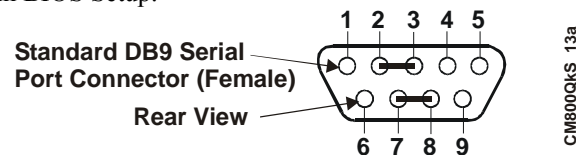

Figure B-2. RS-485 Serial Port Implementation

Table B-5 lists the connections on the I/O Board between Serial Port 2 connector (J7A) and the Utility 1a interface connector (J4) or other connections on the board.

Table B-5. Serial Port 2 (COM2) Interface Pin/Signal Descriptions (J7A)

J7A Pin # (DB9)	Signal	From Onboard Connector & Pin #	Description
1	DCD2*	J4-11	Data Carrier Detect 2 – Indicates external serial device is detecting a carrier signal (i.e., a communication channel is currently open). In direct connect environments, this input is driven by DTR2 as part of the DTR2/DSR2 handshake.
2	RXD2	J4-13	Receive Data 2 Input – This line is typically held at a logic 1 (mark) when no data is being transmitted, and is held "Off" for a brief interval after an "On" to "Off" transition on the RTS2 line to allow the transmission to complete.
3	TXD2	JP1-2 (J4-15, or J4-20)	Serial Transmit Data 2 Output – The signal on this line comes from J4-15 or J4-20 thorough the only jumper (JP1) on the I/O Interface Board.
			TXD2 signal – This signal (J4-15) is available if jumper JP1 on the I/O Board is set to pins 1-2 (default setting). This line (TXD2) is typically held to a logic 1 when no data is being sent. Typically, a logic 0 (On) must be present on RTS1, CTS1, DSR1, and DTR1 before data can be transmitted on this line.
	TTL		TTL signal – This signal (J4-20) is available if jumper JP1 on the I/O Board is set to pins 2-3.
4	DTR2*	J4-17	Data Terminal Ready 2 – Indicates port is powered, initialized, and ready. Used as hardware handshake with DSR2 for overall readiness.
5	GND	J4-19	Ground
6	DSR2*	J4-12	Data Set Ready 2 – Indicates external serial device is powered, initialized, and ready. Used as hardware handshake with DTR2 for overall readiness to communicate.
7	RTS2*	J4-14	Request To Send 2 – Indicates serial port is ready to transmit data. Used as hardware handshake with CTS2 for low level flow control.
8	CTS2*	J4-16	Clear To Send 2 – Indicates external serial device is ready to receive data. Used as hardware handshake with RTS2 for low level flow control.
9	RI2*	J4-18	Ring Indicator 2 – Indicates external serial device is detecting a ring condition. Used by software to initiate operations to answer and open the communications channel.

Notes: The shaded area denotes power or ground. The signals marked with * = Negative true logic.

Table B-6. Miscellaneous Interface Pin/Signal Descriptions (J6)

J6 Pin #	Signal	From Onboard Connector & Pin #	Description
1	PS_ON	J4-10	Power Supply On – This signal from the I/O hub on CoreModule 800 can be used to turn on a power supply.
2	EXTSMI*	J4-36	External SMI – External System Management Interrupt (SMI) signal from an external source is fed directly to the I/O Hub.
3	BATLOW*	J4-38	Battery Low – This signal from an external device or battery indicates there is insufficient power to system.
4	PM_SUSCLK	J5-27	Suspend Clock – This output signal from the I/O Hub can be used by external devices as a refresh clock.
5	FIRMODE	J5-26	IR Mode Select – Terminated with 10k ohm resistor to ground on CoreModule 800.

Notes: The shaded area denotes power or ground. The signals marked with * = Negative true logic.

Table B-7. USB Port 0 & 1 Interface Pin/Signal Descriptions (J8)

J8 Pin #	Signal	From Onboard Connector & Pin #	Description
1	USBPWR0	U1-8	+5V (+/-5%) – Power through Power Distribution Switch (U1) with current limit. Disables this pin if current exceeds limit.
2	USB0-	J4-23	USB Port 0 Data Negative Polarity
3	USB0+	J4-24	USB Port 0 Data Positive Polarity
4	USB GND	NA	Ground
5	USBPWR1	U1-5	+5V (+/-5%) – Power through Power Distribution Switch (U1) with current limit. Disables this pin if current exceeds limit.
6	USB1-	J4-28	USB Port 1 Data Negative Polarity
7	USB1+	J4-29	USB Port 1 Data Positive Polarity
8	USB GND	NA	Ground
9, 10	SHLD GND	NA	Shield Ground
11, 12	SHLD GND	NA	Shield Ground

Note: The shaded area denotes power or ground.

Table B-8. Keyboard Interface Pin/Signal Descriptions (J9A)

J9A Pin #	Signal	From Onboard Connector & Pin #	Description
1	KBDAT	J5-35	Keyboard Data
2, 4	NC	NA	Not connected
3	GND	J5-37	Ground
5	KBVCC	J5-38	Keyboard Power (+5V +/-5%) – Through shared Fuse (F1) to keyboard voltage pin.
6	KBCLK	J5-36	Keyboard Clock

Note: The shaded area denotes power or ground.

Table B-9. Mouse Interface Pin/Signal Descriptions (J9B)

J9B Pin #	Signal	From Onboard Connector & Pin #	Description
1	MSDAT	J4-31	Mouse Data
2, 4	NC	NA	Not connected
3	GND	J5-37	Ground
5	KBVCC	J5-38	Mouse Power (+5V +/-5%) – Provided through shared Fuse (F1) to mouse voltage pin.
6	MSCLK	J4-32	Mouse Clock

Note: The shaded area denotes power or ground.

Table B-10. SMBus Interface Pin/Signal Descriptions (J10)

J10 Pin #	Signal	From Onboard Connector & Pin #	Description
1	SMB_Clk	J5-22	System Management Bus Clock
2	SMB_Data	J5-16	System Management Bus Data
3	SMB_Alert	J5-10	System Management Bus Alert
4	VCC	J5-38	+5 volts +/-5%
5	GND	NA	Ground

Note: The shaded area denotes power or ground.

Table B-11. Floppy Drive Interface Pin/Signal Descriptions (J11)

Pin #	Signal	Description
2	DRVEN0	Drive Density Select 0 – This signal indicates a low (250/300 kbps) or high (500 kbps) data rate has been selected.
4	NC	Not connected
6	NC	Not connected
8	INDEX	Index – Detects the drive head is positioned over the track 0.
10	NC	Not connected (MTR0 - Motor Control 0)
12	DS1	Drive Select 1 – Selects drive 1.
14	NC	Not connected (DS0 - Drive Select 0)
16	MTR1	Motor Control 1 – Selects drive motor 1.
18	DIR	Direction – Direction of head movement (0 = inward motion, 1 = outward motion).
20	STEP	Step – Low pulse for each track-to-track movement of the head.
22	WDATA	Write Data – Encoded data to the drive for write operations.
24	WGATE	Write Gate – Signal to the drive to enable current flow in the write head.
26	TRK0	Track 0 – Sense detects the head is positioned over track 0.
28	WRTPRT	Write Protect – Senses the diskette is write protected.
30	RDATA	Read Data – Raw serial bit stream from the drive for read operations.
32	HDSEL	Head Select – Selects the side for Read/Write operations (0 = side 1, 1 = side 0)
34	DSKCHG	Disk Change – Senses the drive door is open or the diskette has been changed since the last drive selection.
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33	GND	Ground (All odd pins are grounded)

Notes: The shaded area denotes power or ground. The signals marked with * indicate signal inversion.

Table B-12. Parallel Port (LPT) Interface Pin/Signal Descriptions (J12)

Pin #	Signal	Description
1	Strobe*	Strobe* – This is an output signal used to strobe data into the printer. I/O pin in ECP/EPP mode.
2	PD0	Parallel Port Data 0 – These signals <0 to 7> provide the parallel port data signals
3	PD1	Parallel Port Data 1 – Refer to pin-2 for more information.
4	PD2	Parallel Port Data 2 – Refer to pin-2 for more information.
5	PD3	Parallel Port Data 3 – Refer to pin-2 for more information.
6	PD4	Parallel Port Data 4 – Refer to pin-2 for more information.
7	PD5	Parallel Port Data 5 – Refer to pin-2 for more information.
8	PD6	Parallel Port Data 6 – Refer to pin-2 for more information.
9	PD7	Parallel Port Data 7 – Refer to pin-2 for more information.
10	ACK*	Acknowledge – This is a status output signal from the printer. A Low State indicates it has received the data and is ready to accept new data.
11	BUSY	Busy – This is a Status output signal from the printer. A High State indicates the printer is not ready to accept data.
12	PE	Paper End – This is a status output signal from the printer. A High State indicates it is out of paper.
13	SLCT	Select – This is a status output signal from the printer. A High State indicates it is selected and powered on.
14	ALF*	Auto Feed – This is a request signal into the printer to automatically feed one line after each line is printed.
15	ERR*	Error – This is a status output signal from the printer. A Low State indicates an error condition on the printer.
16	INIT*	Initialize – This signal used to Initialize printer. Output in standard mode, I/O in ECP/EPP mode.
17	SLCTIN*	Select In – This output signal is used to select the printer. I/O pin in ECP/EPP mode.
18, 19, 20, 21, 22, 23, 24, 35	GND	Ground

Notes: The shaded area denotes power or ground. The signals marked with * = Negative true logic.

Miscellaneous Components

Table B-13 list the helpful components on the I/O Interface Board.

Table B-13. Miscellaneous Components

Component	Description
Battery	Battery Socket (BAT1) – Supports external Lithium (3.0V) battery for the Real Time Clock on CoreModule 800.
Fuse (F1)	Auto-reset, 1.5 Amp shared fuse for keyboard and mouse.
LED (D1)	Green Hard Disk Drive Activity LED (D1) – Indicates activity on the IDE connector (J6) located on the CoreModule 800. • Steady Green = No IDE devices connected. • Flashing Green = IDE device activity • Steady Off = IDE device connected, but no activity.
LED (D3)	Yellow Power On LED (D3) – Indicates power state of the CoreModule 800. • Steady Yellow = Power On • Steady Off = Power Off
Switch (SW1)	Power Button Switch – Provides external Power on signal (ground) through the interface to CoreModule 800 on pin J5-34.
Switch (SW2)	Reset Switch – Provides external reset signal (ground) to CoreModule 800 on pin J5-33.

Appendix C   Connector Part Numbers

The following tables provide the connectors, including the manufacturers and part numbers for the used on the CoreModule 800, I/O Board, or Cable Adapter Board. These part numbers can be used to determine the mating connectors, when making your own cables. All connectors use 0.100" (2.54 mm) pin spacing unless otherwise indicated.

Table C-1. CoreModule 800 Connector and Manufacturer's Part Numbers

Connector	Pin Number	Mfg	Manufacturer's PN
J1 – Video	44-pin, 2 mm	ADAM Tech	2BHR-44-VUB-0.138-HT
J3 – Ethernet	20-pin, 1.27 mm	Samtec	FTSH-110-04-LM-DH
J4 – Utility 1	40-pin, 1.27 mm	Samtec	FTSH-1-20-01-LM-DV-K
J5 – Utility 2	40-pin, 1.27 mm	Samtec	FTSH-1-20-01-LM-DV-K
J6 – IDE	44-pin, 2 mm	ADAM Tech	2PH2-44-SGB-0.138/.370-HT
J7 – Power	10-pin, 0.150"	Samtec	ASP-16939-17-M

Note: The following list provides the Manufacturer abbreviations used in this table and the web sites where you can locate the required mating connector information.

- Adam Tech = Adam Technologies @   http://www.adam-tech.com
- Astron Tech = Astron Technology Co., Ltd. @   http://www.astron.com.tw
- Keystone Electronics @   http://www.keyelco.com
- Tyco Electronics = TYCO Electronics Corp @   http://www.tycoelectronics.com
- Samtec = Samtec, Inc. @   http://www.samtec.com

Table C-2. I/O Interface Board Connector and Manufacturer's Part Numbers

Connector	Pin Number	Manufacturer	Manufacturer's PN
BT1 – Battery	2-pin, 20 mm Lithium Coin Cell	Keystone Electronics	1061
J4 – Utility 1a Interface	40-pin, 1.27 mm	Samtec	FTSH-1-20-01-LM-DV-K
J5 – Utility 2a Interface	40-pin, 1.27 mm	Samtec	FTSH-1-20-01-LM-DV-K
J6 – Miscell J10 – SMBus	5-pin, 0.100"	Samtec	HMTSW-105-08-LM-S-300
J7 – Serial Ports 1 & 2	9-pins each in stack	Tyco Electronics	1734279-3
J8 – USB Ports 0 & 1	4-pins each in stack	ADAM Tech	USB-A-D-RA-RC
J9 – Keyboard/ Mouse	6-pins each in stack	Astron Tech	13-2302-66S3-5T-R
J11 – Floppy Disk Drive	34-pin, 0.100"	ADAM Tech	BHR-34-VUA-HT
J12 – Parallel Port (LPT1)	25-pin	Tyco Electronics	5747846-4

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