PDI-00446-00
June, 1998

AM-446 RAID Subsystem Installation Instructions

The AM-446 is an UltraWide SCSI RAID (Redundant Array of Independent Disks) subsystem from PMD Inc. As provided by Alpha Micro, the AM-446 consists of up to eight 4.3GB or 9GB SCSI disk drives and a RAID controller, all contained in a single enclosure. The AM-446 includes management and monitoring software which you can use either over TCP/IP or through a serial connection and character-based interface. The TCP/IP management facilities include Web pages, Telnet capability, e-mail, and SNMP.

The AM-446 is supported only under AMOS 2.X. It is not supported under 1.X versions of the operating system!

For topics not covered in this document, such as switching drives inside the RAID cabinet, please refer to the PMD documentation included with the AM-446.

INSTALLATION OVERVIEW

Whether it's provided as part of a complete computer system or shipped independently, the AM-446 is fully configured before it leaves the factory. Therefore, the installation procedure at your site is very straightforward:

1. Attach the AM-446 to the computer's SCSI bus.
2. Enable the built-in management software by making either a serial or Ethernet connection.
3. If you want, enable the AMOS RAID monitoring program, RADMON.

The following sections discuss these steps in more detail.

ATTACHING THE SCSI CABLE

To attach the AM-446 to your computer's SCSI bus, first make sure power is off to both your computer and the AM-446. Remove the external terminator from the computer chassis and plug in an external SCSI cable. Attach the other end of the cable to the HOST IN port on the AM-446. Attach an external terminator to the HOST OUT port on the AM-446. See the next page for more about SCSI termination.

The AM-446 is an UltraWide SCSI device; its SCSI port accepts only a 68-pin Wide SCSI connector. If you are attaching the AM-446 to a Wide SCSI-2 bus, use a standard external Wide cable (PRF-00297-84). To attach the AM-446 to a narrow SCSI-2 bus, you must use a 50-pin to 68-pin cable (PRF-00297-82). The proper cable is included in your AM-446 Accessory Kit.

If you have a Wide SCSI-2 bus, and use an external narrow SCSI device, you should attach it beyond the AM-446, with proper termination of the high nine lines of the Wide SCSI-2 bus where the cable changes from Wide to narrow (the PRF-00297-82 cable does this), and termination of the remaining lines at the end of the bus. See the next section.

SCSI Termination

For your convenience, we disable the internal SCSI terminators in the AM-446 before it leaves the factory. Just plug an external active Wide SCSI terminator into the HOST OUT port on the back of the AM-446. If your computer uses the Wide SCSI-2 bus, you already have this terminator; if your computer uses the narrow SCSI-2 bus, your AM-446 Accessory Kit includes the necessary terminator, PRA-00222-20.

To connect another SCSI device beyond the AM-446, remove the terminator and plug the SCSI cable into HOST OUT. If the additional device is a Wide SCSI device, make sure to terminate the bus after that device. Usually, this just means moving the external terminator to the new device. If the additional device is a narrow SCSI device, you should use a cable terminating the high nine lines of the bus (such as PRF-00297-82) at the AM-446, and a narrow active terminator (PRA-00222-21) attached to the additional device to terminate the remaining lines.

Setting the SCSI ID

The AM-446 comes with its SCSI ID already set according to your configuration request. If you need to change the ID for any reason, you can do so using the management software as described in the PMD documentation.

To boot from the AM-446, you must set your computer's boot ID correctly using the CMOS configuration menu. If your computer doesn't offer a CMOS menu, you must set the AM-446 to SCSI ID 0 if you want to boot from it.

ENABLING THE MANAGEMENT SOFTWARE

The AM-446 includes powerful management and monitoring software which lets you perform functions such as changing the IP address and SCSI ID of the subsystem, setting operational thresholds, and enabling e-mail warning notifications, as well as checking the status of the subsystem and the individual drives at any time. You can use this software through either a character-based interface or a graphical set of World Wide Web pages.

There are both a serial port and a 10BaseT Ethernet port on the AM-446 back panel. You can use the character-based software interface by connecting to either port; to use the Web interface you must connect to the Ethernet port. Some diagnostic features are available only when you use the serial RS-232 interface.

Both the character-based interface and the Web interface are described in detail in the PMD documentation shipped with the AM-446. The following sections discuss compatibility issues, then explain how to connect to the AM-446 so you can use the software.

Terminal Compatibility

To use all the features of the character-based interface, the computer you're connecting from must be capable of VT-100 emulation. If you are connecting from an Alpha Micro computer, it must have a communications package, such as VersiCOMM Plus, which supports VT-100. If you are using a PC, Windows 95 and many other operating systems support VT-100 emulation.

You can use some Alpha Micro terminals—for example, an AM-65—to change some AM-446 settings, such as the IP address, though the display will be garbled and may be difficult to read. You cannot, however, change any of the RAID controller settings, such as the SCSI ID, without a VT-100 emulation.

Connecting Through the Serial Port

The AM-446 serial port is a DB-9 female connector. In the AM-446 Accessory Kits, Alpha Micro includes all the necessary cables and connectors for you to connect from this port to any of the following:

- An AM-359-style RJ-45 connector.
- An AM-355-style DB-9 connector.
- A DB-9 serial port on a PC.
- A DB-25 connector directly to a terminal.

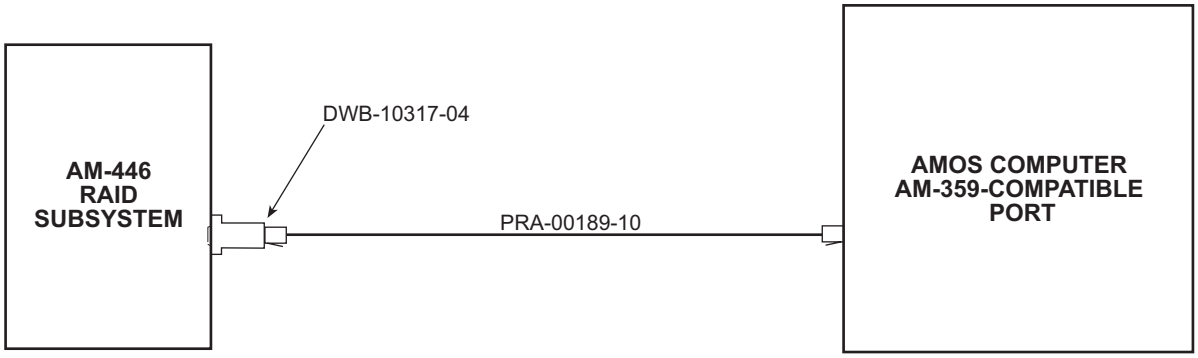
If you are monitoring the AM-446 from an AMOS system, that system can be, but does not have to be, the host system. That is, you can use the AM-446 as a disk drive on one AMOS computer, and attach its monitoring port to a different AMOS computer.

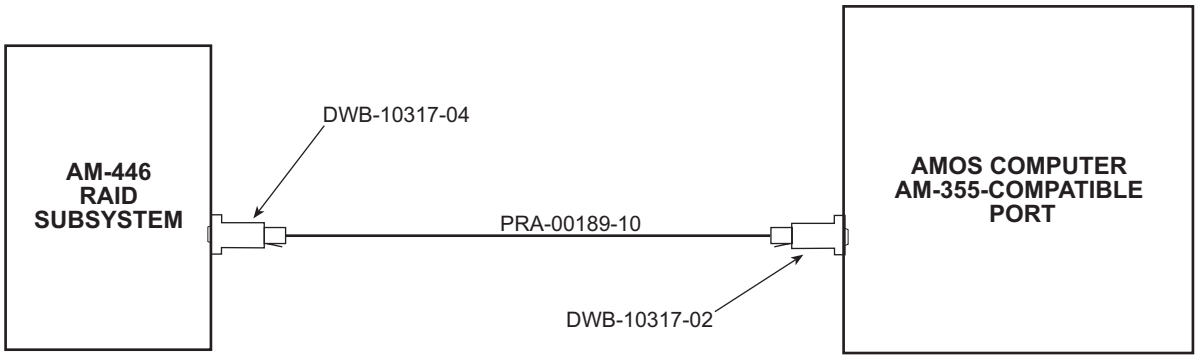
For all of these connections, first plug the DB-9 to RJ-45 adapter, DWB-10317-04, into the serial port on the AM-446, and attach the provided RJ-45 cable, PRA-00189-10, to it. Then continue as shown below:

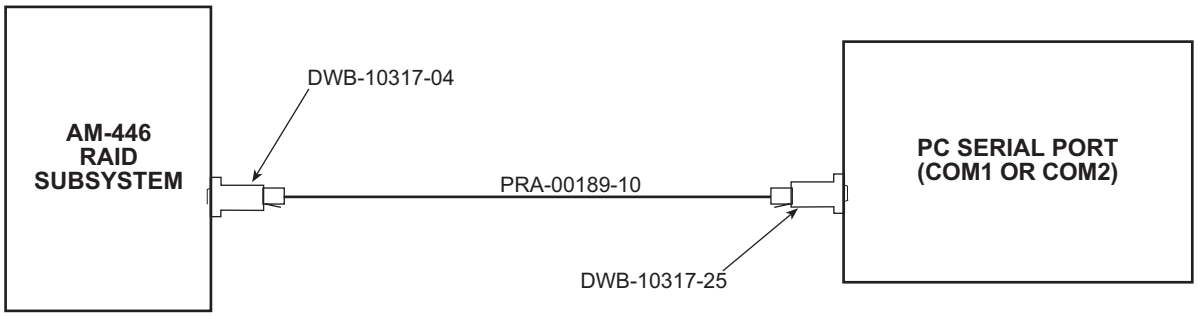
- **To connect to an AM-359-style port:** Plug the other end of the RJ-45 cable into the desired AM-359-compatible port.
- **To connect to an AM-355-style port:** Attach an RJ-45 to DB-9 male adapter, DWB-10317-02, to the other end of the RJ-45 cable. Plug the DB-9 side of the connector into an AM-355-compatible port.
- **To connect to a PC serial port:** Attach an RJ-45 to DB-9 female adapter, DWB-10317-25, to the other end of the RJ-45 cable. Plug the DB-9 side of the connector into a serial port on the PC.
- **To connect directly to a terminal:** Attach an RJ-45 to DB-25 male adapter, PRA-00188-31, to the other end of the RJ-45 cable. Plug the DB-25 connector into the terminal.

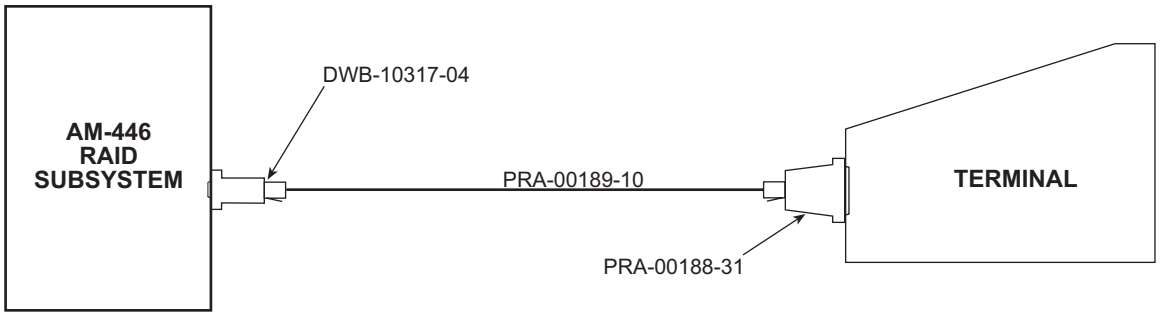
Once the AM-446 is connected to the computer or terminal you will use for management and monitoring, use a VT-100-capable communications program to access the management software. See the PMD documentation for the communications settings to use and detailed instructions on the management software.

The following illustration shows each type of connection:


AM-446
RAID
SUBSYSTEM
DWB-10317-04
PRA-00189-10
AMOS COMPUTER
AM-359-COMPATIBLE
PORT


AM-446
RAID
SUBSYSTEM
DWB-10317-04
PRA-00189-10
DWB-10317-02
AMOS COMPUTER
AM-355-COMPATIBLE
PORT


AM-446
RAID
SUBSYSTEM
DWB-10317-04
PRA-00189-10
DWB-10317-25
PC SERIAL PORT
(COM1 OR COM2)


AM-446
RAID
SUBSYSTEM
DWB-10317-04
PRA-00189-10
PRA-00188-31
TERMINAL

Connecting via Ethernet

You can connect the AM-446 to a 10BaseT Ethernet hub using the supplied RJ-45 connector cable, PRA-00189-10. Of course, you'll need the appropriate adapter for other Ethernet configurations.

If you supplied us with the IP address and subnet mask you wanted for the AM-446, we set these parameters at the factory, and you should be able to access the AM-446 at that address as soon as it is connected and turned on. Otherwise, the AM-446 is still set to its default address, as shown on the back of the unit, and you'll need to change it to its correct IP address and subnet mask using the management software.

Refer to the PMD manual which came with your AM-446 for information on using the Web interface to the management software, and for instructions on changing the IP address and subnet mask, if necessary.

If you are going to access the AM-446 over the Internet, we strongly recommend you change its login and password, as described in the PMD documentation.

As stated in the PMD documentation, if you need to change the IP address of the AM-446 via TCP/IP, the computer you use to do so must be on the same physical and logical network as the AM-446.

MONITORING THROUGH AMOS—THE RADMON UTILITY

AMOS includes a software utility, RADMON, to monitor the status of the RAID drives and report any failures to the system operator's terminal and, optionally, via e-mail messages. You can set this program to run automatically on a background job by modifying your system initialization command file.

What RADMON Does

Once a minute, RADMON checks the AM-446's internally maintained log file to see if any reported events warrant user notification (which events qualify depends on the switches used when you start RADMON, as described below). If it finds any, it sends a message to the system operator's terminal and to any e-mail address(es) you've specified. If the error is not corrected, RADMON repeats the message to the system operator terminal once an hour, and repeats the e-mail message every 24 hours. If another qualifying event is detected, it sends another message immediately.

RADMON Requirements

RADMON works only on AMOS computers which use the SCSI dispatcher. If you want RADMON to send notification messages via e-mail, there are additional requirements:

- Your computer must run AMOS 2.2C or later.
- Your e-mail package must use an e-mail driver.
- SNDMAL.LIT and LODEMD.LIT must be in the SYS: account.

Setting Up RADMON

RADMON runs on a background job attached to a pseudo-terminal. There is no reason to run it on a real terminal, since it sends all messages to the system operator's terminal, not to the terminal it is running on. Follow the steps below to set up RADMON. If you want more information about any part of the initialization file, see the *System Operator's Guide to the System Initialization Command File*.

1. If you want to use e-mail notification, run MUSER and add a user name to uniquely identify the RADMON job on this computer. This will be the FROM name on any mail message RADMON sends.

   Allocate a mailbox for the user name you've just created. Refer to your mail package documentation for instructions.

2. Log to the SYS: account, then create a test copy of your initialization file:

   COPY TEST.INI=AMOS32.INI RETURN

   Then VUE the test file.

3. Add one to the number of jobs in the JOBS statement.

4. Add a JOBALC statement defining a job called RADMON.

5. Add a TRMDEF statement for a pseudo-terminal called RADMON. For example:

   ```
   TRMDEF RADMON,PSEUDO,NULL,80,80,80
   ```

6. Add a SETJOB command to attach the RADMON job to the RADMON pseudo-terminal:

   ```
   SETJOB RADMON,RADMON,70K,RADMON.JIN
   ```

7. If you want RADMON to send e-mail notification, make sure the e-mail driver program is loaded into memory somewhere before the first SYSTEM statement. This statement must also be before the SETJOB statement for the RADMON job.

8. Finish from the test initialization file.

9. In SYS:, create a file called RADMON.JIN containing these statements:

   ```
   :T
   LOG user-name
   RADMON {/ID=id} {/EMAIL=address{,address}}{/option(s)}
   ```

   user-name is the name you set up in step 1. If you aren't using e-mail notification, it can be any user name.

   id is the SCSI ID of the RAID controller. If you don't include the SCSI ID, RADMON will poll the SCSI bus until it finds the controller.

   Each optional ***address*** is an e-mail address you want RADMON to send notification messages to. Each one must be in standard Internet address format: *person@system.*

Option may be:

/O Display messages for event types other than those which normally qualify. This adds event types 2, 14, 22, 24, 27, 28, 29, and 31. For a description of event types, see the PMD manual.

/R Display all event types.

/S Suppress the e-mail message sent when the program starts.

/Z Monitor events from the beginning of the RAID log file; otherwise, when RADMON restarts, it begins checking events from the point where it left off.

The /O, /R, and /Z switches are generally used only when a problem is suspected or known and you need more diagnostic information. They work only with the AM-446, not the earlier AM-445 Raid Controller.

10. Make sure no one else is using the computer and use MONTST to test your new initialization file.

If everything is correct, STAT should show the RADMON job in an Sl (sleep) state. If you set up e-mail notification, a message is sent to the specified addresses telling them that RADMON is running, unless you also used the /S switch.

If there is a problem, change the SETJOB statement to attach RADMON to a real terminal and MONTST again. Check the terminal for error messages so you can correct the situation.

Once you’re satisfied everything is working correctly, rename your test initialization file to make it your standard initialization file.