ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *DIGITAL/Storage Works DS-BA356-SF* at our website: *Click HERE*

DIGITAL Server Cluster with BA356 Ultra Storage

Installation Guide

Part Number: ER-CLUSU-IA. A01

Digital Equipment Corporation

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

November 1997

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation.
Digital Equipment Corporation assumes no responsibility for any errors that might appear in this document.
The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license. No responsibility is assumed for the use or reliability of software or equipment that is not supplied by Digital Equipment Corporation or its affiliated companies.
Restricted Rights: Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.
Copyright© Digital Equipment Corporation.
All Rights Reserved.
DEC, DIGITAL, StorageWorks, ServerWORKS, Quick Launch, and the DIGITAL logo are trademarks of Digital Equipment Corporation.
Adaptec and SCSISelect are trademarks of Adaptec, Inc.
Intel and Pentium are registered trademarks of Intel Corporation.
Windows and MS-DOS are registered trademarks of Microsoft Corporation.
Windows NT and MSCS are trademarks of Microsoft Corporation.
All other trademarks and registered trademarks are the property of their respective holders.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Contents

1
About This Guide

Introduction 1-1
Organization 1-1
Special Notices 1-2
Obtaining More Information 1-2

2
Hardware Installation and Configuration

Overview 2-1
UltraSCSI Single BA356 Configuration 2-2
    Configuring the Shared SCSI Bus Interconnect 2-2
UltraSCSI Dual BA356 Configuration 2-6
    Configuring the Shared Servers/Storage Enclosure SCSI Bus Interconnect 2-6
Configuring the Personality Module 2-9
Adapter Setup 2-12
    Installing an Adaptec Host Adapter 2-12
    Adaptec Host Adapter Configuration 2-13
    Setting Adaptec Host Adapter SCSI IDs 2-13
    Deactivating On-Board Termination through the BIOS 2-14
    Disabling Power-On Reset 2-14
    Booting Windows NT 2-15
    Installing Adaptec Host Adapter Device Drivers 2-15
Verifying Adapter Installation 2-16
Installing Windows NT Clusters Software 2-16

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figures

1. Single BA356 Enclosure Configuration for Windows NT Clusters 2-2
2. Dual BA356 Enclosure Configuration for Windows NT Clusters.....2-6
3. Differential UltraSCSI Personality Module (Bottom view).....2-9
4. DIP Switch Location on Differential UltraSCSI Personality Module (Top view).....2-10
5. Installing an Adaptec Host Adapter.....2-13

Tables

1. FR-CK356-UP Parts List for Single BA356 Pedestal Enclosure Configuration 2-3
2. FR-CK356-UR Parts List for Single BA356 Rackmount Configuration 2-4
3. Compatible Disk Drives Parts List.....2-5
4. Parts List for Dual BA356 Pedestal Enclosure Configuration 2-7
5. Parts List for Dual BA356 Rackmount Configuration.....2-8
6. Compatible Disk Drives Parts List.....2-9
7. DIP Switch Settings for Differential UltraSCSI Personality Module 2-11

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1
About This Guide

Introduction

This guide explains requirements and installation of Windows NT Clusters on DIGITAL Servers with the BA356 Ultra Storage array.



NOTE: This guide applies to DIGITAL Clusters for Windows NT (DIGITAL P/N QB-53V9A-5A) and Microsoft Cluster Server (MSCS - included with Windows NT Enterprise Server Edition) on Intel platforms.

Organization

This guide contains the following:

Chapter 1: *About This Guide* —Describes the purpose and organization of this installation guide.

Chapter 2: *Hardware Installation and Configuration*—Describes how to install and/or set up the DIGITAL Cluster kit components.

For instructions on installing Windows NT Clusters software, see that product's documentation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Special Notices

Three kinds of special notices are used in this guide to emphasize specific information.



WARNING: Indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.



CAUTION: Indicates the presence of a hazard that might cause damage to hardware or that might corrupt software.



NOTES: Used to provide additional information.

Obtaining More Information

Check the DIGITAL web site for the latest drivers, technical tips, and documentation. This information can be found in the DIGITAL web page:

http://www.digital.com/

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2

Hardware Installation and Configuration

Overview

This guide explains requirements and installation of Windows NT Clusters on DIGITAL Servers with the BA356 Ultra Storage array.

Windows NT Clusters provides a high-availability solution for today's client/server LANs. It enables two Windows NT systems to be coupled together, via a shared SCSI bus, to create a single system environment, or cluster. End-users have access to all the cluster resources, such as shared disks, file shares, and database applications, without having to know the names of the individual servers in the cluster. If one server system fails, the second server in the cluster immediately assumes its workload, reconnects clients, and fails-over shared storage and file shares.

The use of differential components – differential SCSI Adapters, differential converters, and differential cabling – is required for this application, as described in the following sections. Use of differential components allows the SCSI bus interconnect length to approach 25 meters, an advantage when creating a cluster configuration.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

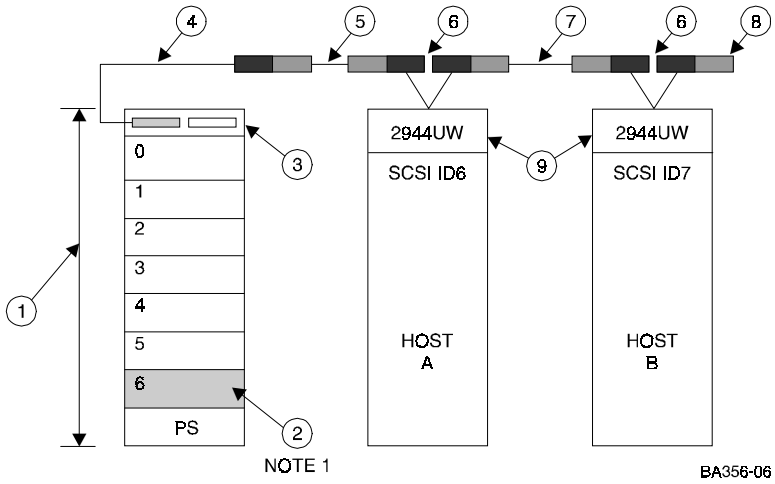
UltraSCSI Single BA356 Configuration

This section explains how to configure one StorageWorks BA356 UltraSCSI Expansion Enclosure.

Configuring the Shared SCSI Bus Interconnect

The components of the cluster are connected through the SCSI bus. The recommended configuration for the StorageWorks Expansion Enclosure (BA356) is shown in Figure 1.

The figure shows the subsystem connected at one end of the shared differential SCSI bus. The differential end-of-bus termination is provided by the Differential UltraSCSI Personality module located in the Expansion Enclosure. DIP switches located in the Differential UltraSCSI Personality module are set to enable SCSI bus termination and to specify the enclosure device IDs.



NOTE 1: Enclosure SCSI ID6 cannot be used for a disk drive because that ID is taken by the host. It may be used as a redundant power supply position.

Figure 1. Single BA356 Enclosure Configuration for Windows NT Clusters

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The table below lists the parts provided in the FR-CK356-UP kit for a Single BA356 Pedestal Enclosure Configuration.

Table 1. FR-CK356-UP Parts List for Single BA356 Pedestal Enclosure Configuration

Key	Part number	Quantity	Description
1	FR-BA356-KH	1	UltraSCSI Wide Differential Pedestal Expansion Enclosure (includes 1 Power Supply - BA35X-HH, and a Differential UltraSCSI Personality module – BA35X-DA)
2	BA35X-HH	1	Optional, 2nd power supply (180 watts) – for redundancy
3	DS–BA35X–DA	1	Included with FR-BA356-KH, differential UltraSCSI Personality Module*****
4	DS–BN37A–05	1	5.0 meter VHDCI male to VHDCI male******
5	DS–BN38E–0B	1	0.2 meter VHDCI female to Straight HD68 male
6	DS–BN21W–0B	2	"Y" Cable, 0.15 meter, one HD68 male to two HD68 females
7	DS–BN21K–05	1	5.0 meter HD68 male to Right HD68 male******
8	H879–AA	1	HD68 SCSI-3 Wide Differential Terminator (male)
9	2944UW	2	PCI to SCSI, Ultra Wide, Differential Host Adapter

***** The Differential UltraSCSI Personality module is part of the BA356-KH UltraSCSI Wide Differential Expansion Enclosure. The BA356-KH UltraSCSI Differential Enclosure will accept only one Personality module.

****** The sum of the lengths of these cables must not exceed 24 meters.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The table below lists the parts provided in the FR-CK356-UR kit for a single BA356 Rackmount configuration.

Table 2. FR-CK356-UR Parts List for Single BA356 Rackmount Configuration

Part number	Quantity	Description
FR-BA356-JF	1	UltraSCSI Wide Differential Rack Expansion Enclosure (includes 1 Power Supply - BA35X-HH, and a Differential UltraSCSI Personality module – BA35X-DA)
BA35X-HH	1	Optional, 2nd power supply (180 watts) – for redundancy
DS–BA35X–DA	1	Included with FR-BA356-JF, differential UltraSCSI Personality Module*
DS–BN37A–05	1	5.0 meter VHDCI male to VHDCI male**
DS–BN38E–0B	1	0.2 meter VHDCI female to Straight HD68 male
DS–BN21W–0B	2	“Y” Cable, 0.15 meter, one HD68 male to two HD68 females
DS–BN21K–05	1	5.0 meter HD68 male to Right HD68 male**
H879–AA	1	HD68 SCSI-3 Wide Differential Terminator (male)
2944UW	2	PCI to SCSI, Ultra Wide, Differential Host Adapter
BA35X-RB	1	Rack Mounting Kit
FR-PCSRA-DJ	1	Chassis support rails
FR-PCSRA-DP	1	19" Mounting Angle

* The Differential UltraSCSI Personality module is part of the BA356-KH UltraSCSI Wide Differential Expansion Enclosure. The BA356-KH UltraSCSI Differential Enclosure will accept only one Personality module.

** The sum of the lengths of these cables must not exceed 24 meters.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 3 lists the number and size of UltraSCSI Wide disk drives that are compatible with the UltraSCSI BA356 StorageWorks configurations.

Table 3. Compatible Disk Drives Parts List

StorageWorks Part Number	Description	Speed	Quantity
FR-RZ1BB-VW	2.10 GB UltraSCSI Wide Disk Drive	7200 rpm	up to 6 drives
FR-RZ1CB-VW	4.29 GB UltraSCSI Wide Disk Drive	7200 rpm	up to 6 drives
FR-RZ1DB-VW	9.10 GB UltraSCSI Wide Disk Drive	7200 rpm	up to 6 drives

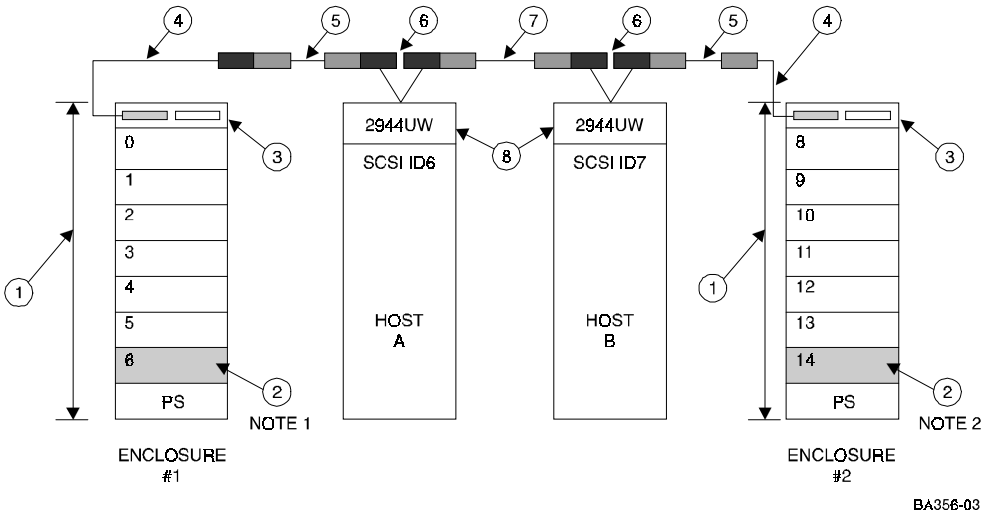
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

UltraSCSI Dual BA356 Configuration

This section explains how to configure two StorageWorks BA356 UltraSCSI Expansion Enclosures connected through the SCSI bus.

Configuring the Shared Servers/Storage Enclosure SCSI Bus Interconnect

The components of the cluster are connected through the SCSI bus. The recommended configuration for two BA356-KH StorageWorks Wide Expansion Enclosures is shown below. Figure 2 shows the storage enclosures connected at each end of the shared differential SCSI bus.



NOTES:

1. Enclosure #1/SCSI ID6 may only be used for a redundant power supply.
2. Enclosure #2/SCSI ID14 may be used for a redundant power supply or a disk drive.

Figure 2. Dual BA356 Enclosure Configuration for Windows NT Clusters

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 1 on page 2-3 lists the parts provided in the kit for a single BA356 Pedestal configuration. Table 4 below lists the single BA356 Pedestal configuration plus the additional parts required for a dual BA356 Pedestal configuration.

Table 4. Parts List for Dual BA356 Pedestal Enclosure Configuration

Key	Part number	Quantity	Description
1	FR-BA356-KH*	2	UltraSCSI Wide Differential Pedestal Expansion Enclosure (includes 1 Power Supply - BA35X-HH, and a Differential UltraSCSI Personality module – BA35X-DA)
2	BA35X-HH	1	Optional, 2nd power supply (180 watts) – for redundancy
3	DS–BA35X–DA	2	Included with FR-BA356-KH, differential UltraSCSI Personality Module**
4	DS–BN37A–05*	2	5.0 meter VHDCI male to VHDCI male***
5	DS–BN38E–0B*	2	0.2 meter VHDCI female to Straight HD68 male
6	DS–BN21W–0B	2	“Y” Cable, 0.15 meter, one HD68 male to two HD68 females
7	DS–BN21K–05	1	5.0 meter HD68 male to Right HD68 male***
8	SWXA3-BD	2	PCI to SCSI, Ultra Wide, Differential Host Adapter

* One of each of these items must be ordered separately to upgrade from a single pedestal configuration to a dual pedestal configuration.

** The Differential UltraSCSI Personality module is part of the BA356-KH UltraSCSI Differential Expansion Enclosure. The BA356-KH UltraSCSI Differential Enclosure will accept only one Personality module.

*** The sum of the lengths of these cables must not exceed 24 meters.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 2 on page 2-4 lists the parts provided in the kit for a single BA356 Rackmount configuration. Table 5 below lists the single BA356 Rackmount configuration plus the additional parts required for a dual BA356 Rackmount configuration.

Table 5. Parts List for Dual BA356 Rackmount Configuration

Part number	Quantity	Description
FR-BA356-JF*	1	UltraSCSI Wide Differential Rack Expansion Enclosure (includes 1 Power Supply - BA35X-HH, and a Differential UltraSCSI Personality module – BA35X-DA)
BA35X-HH	1	Optional, 2nd power supply (180 watts) – for redundancy
DS–BA35X–DA	1	Included with FR-BA356-JF, differential UltraSCSI Personality Module**
DS–BN37A–05*	1	5.0 meter VHDCI male to VHDCI male***
DS–BN38E–0B*	1	0.2 meter VHDCI female to Straight HD68 male
DS–BN21W–0B	2	"Y" Cable, 0.15 meter, one HD68 male to two HD68 females
DS–BN21K–05	1	5.0 meter HD68 male to Right HD68 male***
H879–AA	1	HD68 SCSI-3 Wide Differential Terminator (male)
2944UW	2	PCI to SCSI, Ultra Wide, Differential Host Adapter
BA35X-RB*	1	Rack mounting Kit
FR-PCSRA-DJ*	1	Chassis support rails
FR-PCSRA-DP*	1	19" Mounting Angle

* One of each of these items must be ordered separately to upgrade from a single rackmount configuration to a dual rackmount configuration.

** The Differential UltraSCSI Personality module is part of the BA356-KH UltraSCSI Differential Expansion Enclosure. The BA356-KH UltraSCSI Differential Enclosure will accept only one Personality module.

*** The sum of the lengths of these cables must not exceed 24 meters.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 6 lists the number and size of UltraSCSI disk drives that are compatible with dual StorageWorks configurations.

Table 6. Compatible Disk Drives Parts List

StorageWorks Part Number	Description	Speed	Quantity
FR-RZ1BB-VW	2.10 GB UltraSCSI Wide Disk Drive	7200 rpm	up to 13 drives
FR-RZ1CB-VW	4.29 GB UltraSCSI Wide Disk Drive	7200 rpm	up to 13 drives
FR-RZ1DB-VW	9.10 GB UltraSCSI Wide Disk Drive	7200 rpm	up to 13 drives

Configuring the Personality Module

The differential end-of-bus termination is provided by the Differential UltraSCSI Personality module (see Figure 3) located in the Expansion Enclosures. DIP switches located on the Differential UltraSCSI Personality module are set to enable SCSI bus termination and to specify the enclosure device IDs (see Figure 4).

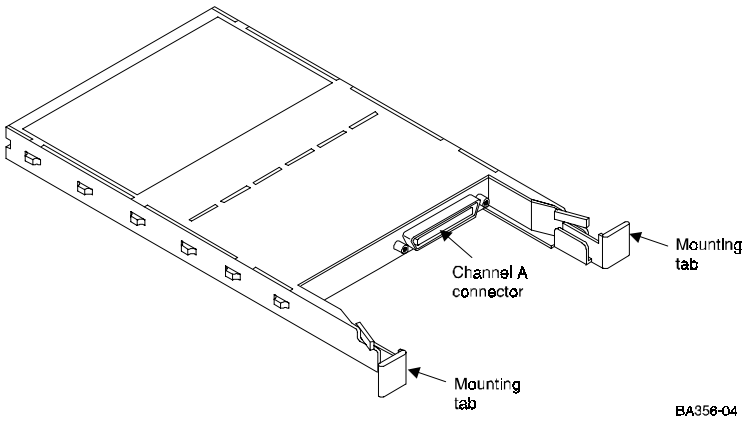


Figure 3. Differential UltraSCSI Personality Module (Bottom view)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

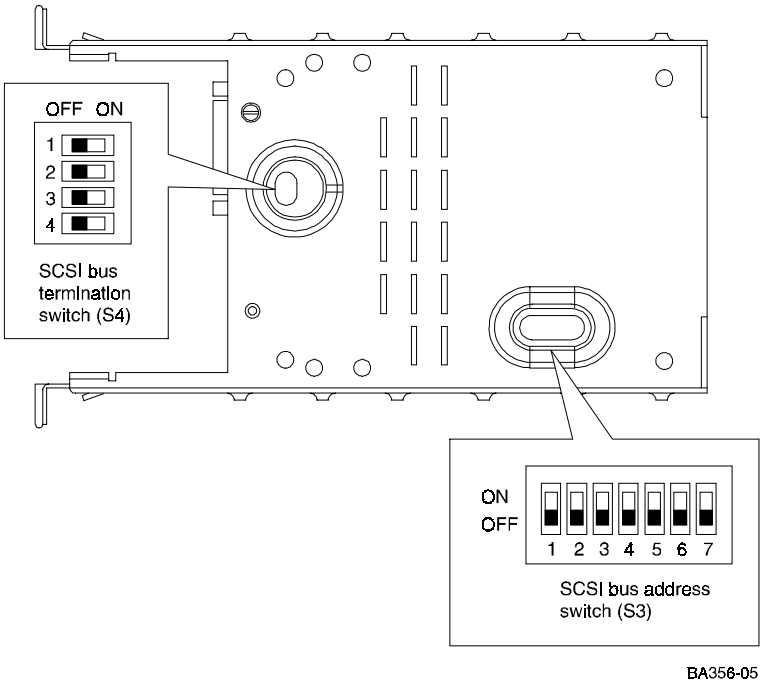


Figure 4. DIP Switch Location on Differential UltraSCSI Personality Module (Top view)

NOTE: Switch position may be described as “ON”, “OFF”, “CLOSED”, or “OPEN”. In this Guide:

“ON” = “CLOSED”
“OFF” = “OPEN”

In all cases the SCSI bus termination switch (S4) will have all four DIP switches in the “OFF” position. The SCSI bus address switch (S3) will have all seven DIP switches in the “OFF” position for the enclosure with SCSI ID0 through SCSI ID5. The SCSI bus address switch (S3) will have DIP switches 1, 2, and 3 in the “ON” position and switches 4, 5, 6, and 7 in the “OFF” position for the enclosure with SCSI ID8 through SCSI ID14. Refer to Figure 4 and Table 7.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 7. DIP Switch Settings for Differential UltraSCSI Personality Module

DIP Switch Number	Switch S3 for SCSI IDs 0–5	Switch S3 for SCSI IDs 8–14	Switch S4 for Bus Termination
1	OFF	ON	OFF
2	OFF	ON	OFF
3	OFF	ON	OFF
4	OFF	OFF	OFF
5	OFF	OFF	N/A
6	OFF	OFF	N/A
7	OFF	OFF	N/A

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Adapter Setup

- Differential end-of-bus termination is provided by the BA35X-DA.
- Single ended end-of-bus internal shelf termination is provided by the BA35X-DA Personality module in each Expansion Enclosure.

For each Adaptec 2944UW, the SCSI*Select* utility must be invoked (Ctrl A) from each host to:

- select SCSI ID 6 or 7 (each adapter must be different)
- disable Power-On Reset
- set host adapter SCSI termination to Low Off/High Off

Installing an Adaptec Host Adapter

To install an Adaptec 2944UW host adapter into a host server, follow these steps:

1. Turn off power to the server and disconnect the power cord.
2. Consult the server documentation to remove the cover of the server case.
3. Remove the host adapter from the anti-static bag. (If you need to put the host adapter down, place it on top of the bag.)
4. Remove the bulkhead cover of an empty 5-volt PCI bus mastering slot.
5. Insert the host adapter into the slot as shown in Figure 5.
6. Press down on the host adapter firmly, so the contacts are securely seated in the slot.
7. Tighten the host adapter against the server frame with the screw shown in Figure 5.

Repeat steps 1 through 7 to install a host adapter in the second host system.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

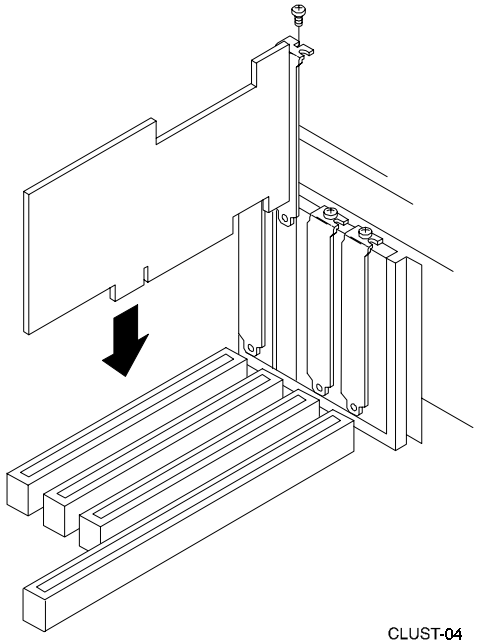


Figure 5. Installing an Adaptec Host Adapter

Adaptec Host Adapter Configuration

Run the Host Adapter Utility to set a unique SCSI ID for each host adapter. Set the host adapter in Host A to SCSI ID 6 and the host adapter in Host B to SCSI ID 7.

Deactivate the on-board termination and disable the power-on reset of an Adaptec Host Adapter using the Adaptec SCSI*Select* Utility.

Setting Adaptec Host Adapter SCSI IDs

To set the SCSI ID for a host adapter, follow these steps:

1. Turn on the power to Host A. While the server boots, simultaneously press the **Ctrl** and **A** keys to invoke the SCSI*Select* Utility. The SCSI*Select* Utility option menu is displayed.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. Highlight the `Configure/View Host Adapter Settings` option and press the **`Enter`** key to select. The configuration menu is displayed.
3. The `Host Adapter SCSI ID` option appears highlighted. Press the **`Enter`** key and a list of SCSI IDs is displayed.
4. Highlight `6` (for Host A) or `7` (for Host B) and press the **`Enter`** key.
5. Go to *Deactivating On-Board Termination through the BIOS.*

Deactivating On-Board Termination through the BIOS

To deactivate on-board termination with the SCSI*Select* Utility, follow these steps:

1. Highlight the `Host Adapter SCSI Termination` option and press the **`Enter`** key. A list of termination settings is displayed.
2. Highlight `Low Off/High Off` and press the **`Enter`** key.
3. Go to *Disabling Power-On Reset.*

Disabling Power-On Reset

To disable power-on reset, follow these steps:

1. Highlight `Advanced Configuration Options` from the SCSI*Select* Utility Configuration menu and press the **`Enter`** key. The Advanced configuration menu is displayed.
2. Highlight the `Reset SCSI Bus at IC Initialization` option. Press the **`Enter`** key. A list of reset options is displayed.
3. Highlight `Disabled` and press the **`Enter`** key.
4. Press the **`Esc`** key to return to the Configuration menu.
5. Press the **`Esc`** key again and save the changes that you made when prompted.
6. Press the **`Esc`** key to exit the SCSISelect Utility.

Go back to the following sections:

1. *Setting Adaptec Host Adapter SCSI IDs* and repeat same steps on Host B.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. *Deactivating On-Board Termination through the BIOS.*
3. *Disabling Power-On Reset*, then go to *Booting Windows NT*.

Booting Windows NT

Boot Windows NT on both servers if Windows NT did not already boot when you exited the host adapter BIOS.

Installing Adaptec Host Adapter Device Drivers

To install Adaptec host adapter device drivers, follow these steps (Adaptec Windows NT diskette contains the appropriate drivers):

1. Log onto the Windows NT system with Administrator privileges.
2. Click on the `Windows NT Setup` icon in the main program group.
3. Select the `Options` menu in the Windows NT Setup window.
4. Select the `Add/Remove SCSI Adapter` function.
5. Click on the `Add` button in the dialog box.
6. A warning message is displayed; click on the `OK` button in the `Confirm` box.
7. From the list of adapters on the display, scroll to the end of the list, and select `Other`. You may have to click on the list to reveal all of the options including the "`Other`" option. The `Insert Disk` window is displayed.
8. Insert the Adaptec Family Driver set diskette for Windows NT, which came with the adapter in your platform kit, into your system's floppy drive.
9. Type, for example: **`A:\winnt\4_0`** and click `OK`. Windows NT Setup momentarily displays a window and then displays the `Select OEM Option` window.
10. Click `OK` to select the driver entry displayed in the Select OEM Option window. The `Select SCSI Adapter Option` window is displayed.
11. Click `Install` to add the selected driver displayed in the `Select SCSI Adapter Option` window. The SCSI Adapter Setup Window appears.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

12. Click `Close` to close the SCSI Adapter Setup Window.
13. Restart the server for the new driver to take effect.

Repeat steps 1–13 on the other server.

Verifying Adapter Installation

To verify that that the 2944UW adapter has been properly installed, follow these steps:

1. Boot Windows NT Operating System for Host A.
2. Verify that the 2944UW banner is displayed signifying that the System has properly configured the 2944UW adapter.
3. After Windows NT boots, launch `Disk Administrator` and verify that either formatted or raw partitions exist for each of the devices you have configured on the shared bus.



NOTE: See the Windows NT manual for information on partition assignments with Windows NT Disk Administrator Host A/Host B.

4. Partition and format drives.
5. Boot Windows NT Operating System for Host B.
6. Again verify that the 2944UW banner is displayed indicating that the System has properly configured the 2944UW adapter.
7. Launch `Disk Administrator`. Verify that formatted partitions exist for each of the devices you have configured on the shared bus.
8. Go to Cluster Management software to complete the procedures for creating your Windows NT cluster.

Installing Windows NT Clusters Software

See that product's documentation for further instructions.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP