# *ASUS*® PCI-SIU2
## Ultra2 PCI SCSI Card

# USER'S MANUAL

# User's Notice

| Product Name: | **ASUS PCI-SIU2** |
|---|---|
| Manual Revision: | **1.00 E437** |
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# Declarations

## Declaration of the Manufacturer/Importer

We hereby certify that the PCI-SIU2 PCI– Ultra2 SCSI Bus Master Host Adapters, in compliance with the requirements of BMPT Vfg 243/1991, is RFI suppressed. The normal operation of some equipment (e.g., signal generators) may be subject to specific restrictions. Please observe the notices in the user's manual.

The marketing and sale of the equipment was reported to the Federal Office for Telecommunication Permits (BZT). The right to retest this equipment to verify compliance with the regulation was given to the ZZF.

## EN 55 PCI-SIU2 Declaration of Conformance

This is to certify that the PCI-SIU2 PCI–Ultra2 SCSI Bus Master Host Adapter is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 9100UW2:1987 Class B (CISPR 22:1985/ BS 6527:1988).

EN50081-1 GENERIC EMISSIONS STANDARD

EN50082-1 GENERIC IMMUNITY STANDARD

1. IEC 801-2 :1984(1000-4-2:1995);

2. IEC 801-3 :1984(1000-4-3:1995);

3. IEC 801-4 :1988(1000-4-4:1995).

## Production Notes

This User's Manual was created using Macintosh versions of Adobe® PageMaker™ 6.52, Adobe® Photoshop™ 5.0.2, and Macromedia® Freehand™ 8.0.1. The body text type used in this manual is "Times" (MAC) or "Times New Roman" (Windows) and headings are "Helvetica" (MAC) or "Arial" (Windows).

# FCC & DOC Compliance

## *Federal Communications Commission Statement*

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

> **WARNING!** Any changes or modifications to this product not expressly approved by the manufacturer could void any assurances of safety or performance and could result in violation of Part 15 of the FCC Rules.

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## *Canadian Department of Communications Statement*

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

**This Class B digital apparatus complies with Canadian ICES-003.**

**Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.**

# Contents

# Contents

# 1. Introduction

*1*

## The ASUS PCI-SIU2 Host Adapter

The ASUS® PCI-SIU2™ is a high-performance Ultra2 (Low Voltage Differential) PCI bus master host adapter which provides the interface between the SCSI bus and the PCI local bus. The PCI-SIU2 supports 32-bit data transfers across the high bandwidth PCI bus at speeds up to 133 Mbytes per second. The advanced Integrated Scatter/Gather Engine (ISGE™) reduces the command overhead time enhancing the overall system response, thus providing exceptional performance for the PCI-SIU2.

An on-board utility program is designed into the host adapter to simplify SCSI bus set-up. The SmartSCSI™ Setup Utility program enables simple integration of the PCI-SIU2 into most platforms and with many operating systems. The SmartSCSI utility will enhance the installation procedure of the host adapter and allow for complete self-integration in those systems that implement the current plug and play standards. The PCI-SIU2 complies with plug and play applications on systems using PCI bus standards.

The PCI-SIU2 will support asynchronous SCSI bus transfer to a maximum rate of 10 Mbytes per second and synchronous Ultra2 SCSI bus transfers to a rate of 80 Mbytes per second. Full support of Ultra2 defined by SCSI specification, disconnect/reconnect and command queuing provides maximum bus utilization in multiple target implementation.

## Minimum System Requirements

- IBM-compatible PC-486, Pentium or above
- Windows 95, Windows 98, Windows NT, Win3.1, DOS 6.0, OS/2, SCO Unix, SCO UnixWare, or Novell NetWare Operating Systems
- One availiable PCI slot
- SCSI peripheral

# 1. Technical Illustration

FIGURE 1 identifies major components pertaining to your PCI-SIU2 host adapter. You will find it helpful to refer to this illustration while installing the host adapter and attaching the cables.
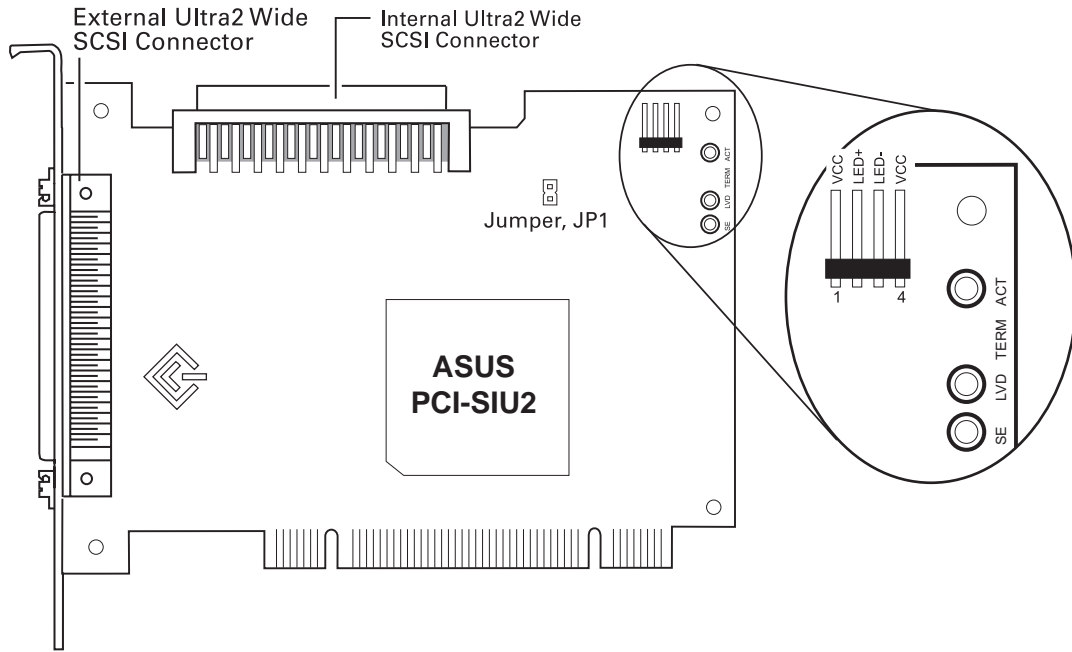


*FIGURE 1* / PCI-SIU2 Board Layout

# 1. Product Features/Specifications

## Product Features

- **PCI Compatibility:** The PCI Bus is a 32-bit bus with multiplexed address and data lines. The PCI-SIU2 is compliant with PCI 2.1 bus protocol, electrical and mechanical specifications.

- **Plug and Play:** The PCI-SIU2 has an on-board read only memory (ROM) to provide the necessary configuration mechanisms for installation, configuration, and booting without user intervention.

- **133 MBytes per second PCI burst mode:** The 32-bit data path for the PCI bus structure running in a synchronous mode at 33 MHz gives maximum operating speeds of 133 MBytes/second.

- **80 MBytes per second data transfer:** Up to 80 MBytes/sec synchronous Ultra2 SCSI data transfers for the PCI-SIU2.

- **Programmable/Automatic SCSI Termination:** Allows the user to choose between programmable or auto-SCSI termination, eliminating the need to remove system unit covers each time a change is made in SCSI bus configuration.

- **Onboard BIOS supports MS-DOS, Windows 3.1x:** The PCI-SIU2 has the necessary software support *on-board*–allowing you to run disk drive operations for MS-DOS and Windows 3.1x *without* any extra drivers.

- **Operating System Support:** Extensively tested and proven reliable, the PCI-SIU2 guarantees compatibility with DOS/Windows, Windows 95/98, Windows NT, OS/2, SCO Unix, UnixWare, and Novell NetWare.

- **ISGE™ Integrated Scatter/Gather Engine:** ASUS host adapters have incorporated advanced hardware functions to provide increased performance in all Scatter/Gather operations.

- **No Hardware Jumpers to set:** ASUS host adapters embed an intelligent software utility to set configuration options.

- **Compatible with Hard Disk, CD-ROM, Optical, Tape, Printer, and other SCSI products:** The PCI-SIU2 is a complete SCSI implementation. All peripherals are compliant with Ultra2 SCSI (LVD), FastSCSI, SCSI-2 and SCSI-1 and can be used with the PCI-SIU2.

# Product Features/Specifications

- **256-byte FIFO:** A 256-byte FIFO buffer is designed into the PCI-SIU2 and is utilized as a caching buffer to manage PCI to SCSI bus structure timing for data and command transfer.

- **Command Queuing:** A unique implementation to provide 255 simultaneous SCSI commands.

- **SCSI compliant:** The PCI-SIU2 is fully SCSI compliant, implementing advanced features such as:

  - Tag Queuing
  - Sync/Async Transfers
  - Disconnect / Reselect Arbitration

## Product Specifications

**Power Requirements**
- 5.0 ± 0.25 V at 0.51 Amps maximum not including bus termination

**Physical Dimensions**
- 5.25" x 3.80" (13.34 cm x 9.96 cm)

## Environmental Specifications

**Operating Temperature**
- 0 to 55°C (32 to 131°F)
- 10% to 90% relative humidity (non-condensing)

**Storage Temperature**
- -40 to 75°C (-40 to 167°F)
- 5% to 95% relative humidity (non-condensing)

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# Host Adapter and the SCSI Bus

The PCI-SIU2 is a bus mastering host adapter which works with the host computer to provide control for the SCSI bus. By daisy chaining peripheral devices together, up to 15 SCSI devices can be connected to the PCI-SIU2. The host adapter can be placed in any standard PCI slot on the bus.

# SCSI Bus Preparation

Peripheral devices attached to the SCSI bus can either be an internal or external device. Each peripheral has a specific device ID, commonly referred to as a "SCSI ID." The SCSI ID determines priority when two or more devices are trying to use the SCSI bus at the same time. No two devices can have the same ID; the device ID uniquely defines the device to the SCSI bus. The PCI-SIU2 is preset to SCSI ID 7 and should not be changed. This gives it the highest priority on the SCSI bus. Please refer to your peripheral documentation to determine switch or jumper settings for SCSI ID's. Here are some general guidelines for SCSI IDs:

- SCSI ID numbers don't have to be sequential, as long as the PCI-SIU2 and each peripheral has a different number. For example, you can have an internal SCSI peripheral with ID 0, and an external SCSI periphera1 with ID 6. Gaps in the sequence of numbers don't matter.

- For internal SCSI peripherals, the SCSI ID usually is set by configuring a jumper on the peripheral.

- For external SCSI peripherals, the SCSI ID usually is set with a switch on the back of the peripheral.

- SCSI ID 7 has the highest priority on the SCSI bus. The priority of the remaining IDs, in descending order, is 6 to 0, 15 to 8.

- Most internal SCSI hard disk drives come from the factory preset for SCSI ID 0.

# 2. Getting Started

- If you have 8-bit SCSI peripherals, they must use SCSI IDs 0, 1, 2, 3, 4, 5, or 6. SCSI ID 0 is recommended for the first SCSI hard disk drive.

- In Windows 95/98, you can use the Device Manager to view the SCSI ID (and other details) assigned to each SCSI device installed.

- Through ASUS's SmartSCSI, you can use the utility to view the SCSI ID (and other details) assigned to each SCSI device installed.

## SCSI Bus Termination

The SCSI bus structure has a length limitation as well as a requirement for termination at each end of the SCSI cable. The cable is designed to connect in a daisy chain fashion. No branching is permitted in the SCSI bus. The first and last physical SCSI device on the SCSI bus must be terminated (see Cabling Examples). To ensure reliable communication on the SCSI bus, the ends of the SCSI bus must be properly terminated. This is accomplished when the peripheral at the end of each cable, or the end of the cable itself, has a terminator installed (or enabled). The peripherals between the ends of each cable must have its terminator removed (or disabled).

Since the method for terminating a SCSI peripheral can vary widely, refer to the peripheral's documentation for instructions on how to enable or disable termination. Here are some general guidelines for termination:

- Internal Ultra2 peripherals are set at the factory with termination disabled and cannot be changed. Proper termination for internal Ultra2 peripherals is provided by the built-in terminator at the end of the Ultra2 internal SCSI cable.

- Termination on internal SCSI peripherals usually is controlled by manually setting a jumper or a switch on the peripheral, or by physically removing or installing one or more resistor modules on the peripheral.

- Termination on external SCSI peripherals is usually controlled by installing or removing a SCSI terminator. On some external peripherals, termination is controlled by setting a switch on the back of the drive.

- By default, termination on the PCI-SIU2 is automatic (the preferred method). To manually set termination on the PCI-SIU2, see **Host Adapter Setup** in Chapter 4.

- Most non Ultra2 SCSI peripherals come from the factory with termination enabled.

# 2. Getting Started

## Mixing UltraSCSI &U2 (LVD) SCSI Devices

The PCI-SIU2 supports legacy drives. However, in order to maximize performance of SCSI I/O's it is recommended to only connect LVD (Ultra2) devices to the PCI-SIU2. If a legacy device is attached to the PCI-SIU2, the devices attached will be switched to SE (Single-Ended) mode. Then all SE SCSI parameters (# of devices, cable length, cable impedence) will become in effect.

## Cabling Examples
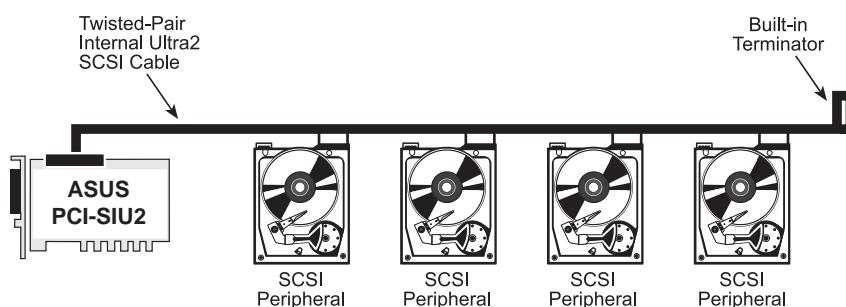


*FIGURE 2* / Connecting internal peripherals
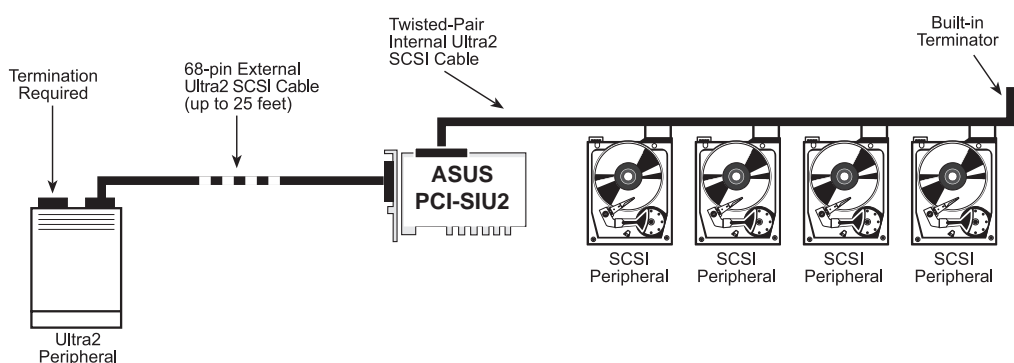


*FIGURE 3* / Connecting point-to-point external peripheral and internal peripherals
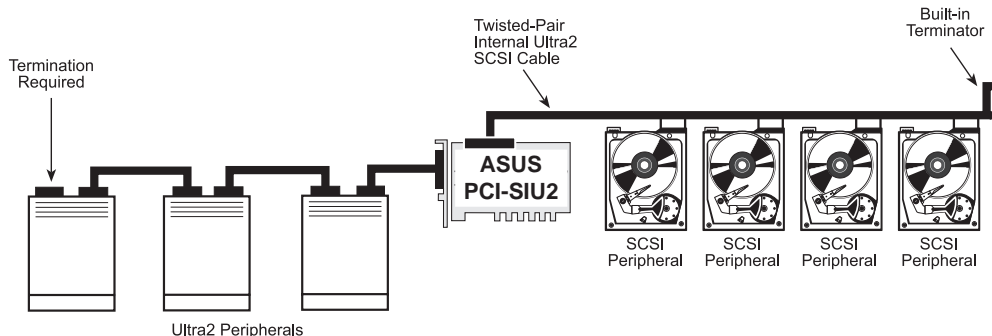


*FIGURE 4* / Connecting three external peripheral and four internal peripherals

# 2. Getting Started

PCI-SIU2's SCSI termination can be set to auto-termination or programmable mode via the SmartSCSI Setup Utility. This feature allows the operator to switch the auto-termination On or Off. If auto-termination is switched Off, the operator can manually program termination for the host adapter. There are several ways to manually control terminating the host adapter on the SCSI bus. The following is a sampling:

| SCENARIO | INT. CONNECTOR | | EXT. CONNECTOR | | Hi Bit | Low Bit |
| | 68-pin SCSI Device(s) | 50-pin SCSI Device(s) | 68-pin SCSI Device(s) | 50-pin SCSI Device(s) | | |
|---|---|---|---|---|---|---|
| 1 | X | | | | ON | ON |
| 2 | | | X | | ON | ON |
| 3 | X | | X | | OFF | OFF |
| 4 | | X | | | ON | ON |
| 5 | | | | X | ON | ON |
| 6 | | X | | | ON | OFF |
| 7 | X | X | | | ON | ON |
| 8 | | | X | X | ON | ON |
| 9 | X | X | X | X | OFF | OFF |
| 10 | X | | | X | ON | OFF |
| 11 | | X | X | | ON | OFF |
| 12 | X | X | X | | OFF | OFF |
| 13 | X | | X | X | OFF | OFF |
| 14 | X | X | | X | ON | OFF |
| 15 | | X | X | X | ON | OFF |

**NOTE: When mixing 68-pin and 50-pin SCSI devices on the same daisy chain, it is highly recommended that the 68-pin SCSI device is connected *furthest away* from the PCI-SIU2 host adapter.**

*FIGURE 5* / Possible Termination Options Settings

[1] Assumption: Host adapter is at the end of the SCSI bus
[2] Assumption: Host adapter is in the middle of the SCSI bus

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## Installation Basics

The internal cable permits connection of multiple internal devices. SCSI devices that are connected to the internal connector are installed inside the host computer enclosure. The external connector is accesible through the D-shell connector at the back of the host system and is designed to connect devices outside the host system enclosure.

The PCI-SIU2 has one internal 68-pin high-density connector and one external 68-pin high-density connector for a combined support for 15 SCSI devices. The two connectors are the same except for the screw holes on the sides of the external connector.

*High Density External...........*
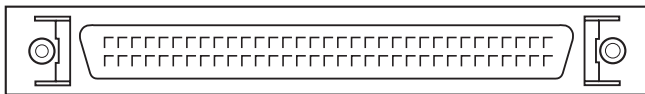
*High Density Internal............*
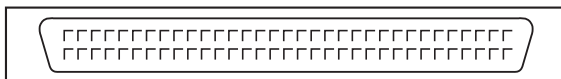
*FIGURE 5* | Connector Details

**NOTE:**
**Attaching UltraWide or UltraSCSI peripherals to the Ultra2 SCSI segment of the SCSI bus causes the Ultra2 SCSI segment and any attached peripherals to drop to UltraSCSI performance levels (40 MBytes/sec). Attaching only Ultra2 peripherals to the PCI-SIU2 ensures that all peripherals on the Ultra2 segment will perform at Ultra2 performance levels (80 Mbytes/sec).**

# Installing the PCI-SIU2 Host Adapter

**1    Power down the host computer and all peripherals**
Remove the cover from the host system. You may need to refer to the system manual for cover removal. If necessary, identify the PCI sockets inside the host system with the aid of the system documentation.

**2    Use static electricity discharge precautions**
Remove possible static discharge potential from any objects that the host adapter may come in contact with before installation. This can be accomplished by touching a bare metal chassis rail after you have turned off the power.

**3    Inserting the host adapter**
Orient the host adapter for installation so that the external connector is facing the back of the system unit and align the card with the PCI connector on the system unit (see FIGURE 6). Holding the adapter by the mounting bracket and the card edge, match up the card edge connector with the PCI host computer socket and insert the card into the socket. Once the connector is in the PCI expansion slot socket tighten the mounting bracket screw to secure the card in place.
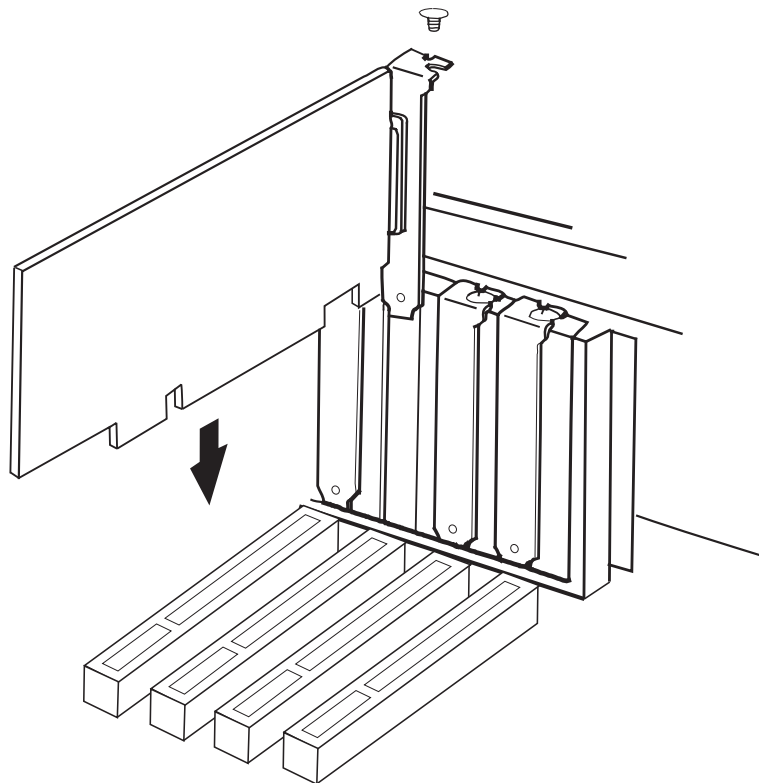


*FIGURE 6*  / Inserting the host adapter into a PCI slot

# 3. Hardware Installation

**4a    Installation of internal SCSI devices**

A total of 15 SCSI peripherals can be connected to the PCI-SIU2.  One internal 68-pin high density Ultra2 cable is included (see FIGURE 7). This cable is used to connect internal target devices.  The internal cable is made with multiple connectors attached and used to daisy chain the host adapters to two or more target devices.  The connector on the host adapter is keyed for proper orientation and insertion. Plug the long end of the cable to the host adapter and the remaining connectors to the target SCSI devices.  It is important to use the cable with the termination on one end of the cable towards the target device side.  The cable is limited to a total lenghth of 12 meters including external cabling. Installation of internal cable must be performed before replacing the cover.
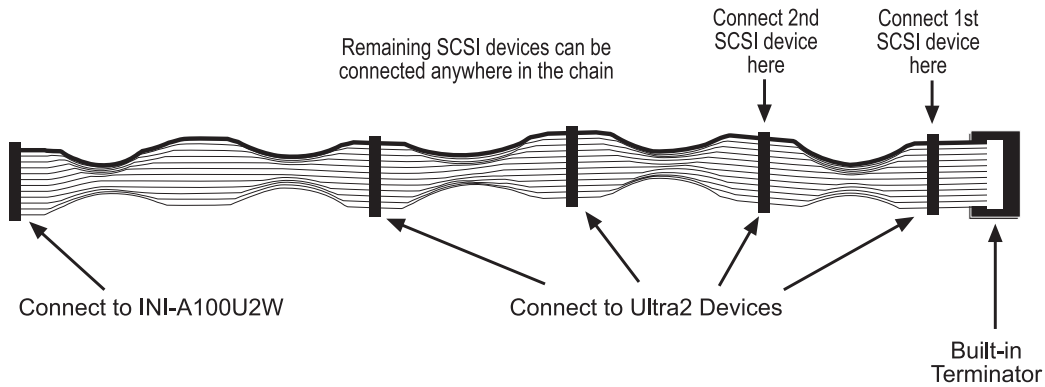


*FIGURE 7 /*
Self-terminating high-density 68-pin Ultra2 internal cable
(included, may vary in length and number of connectors)
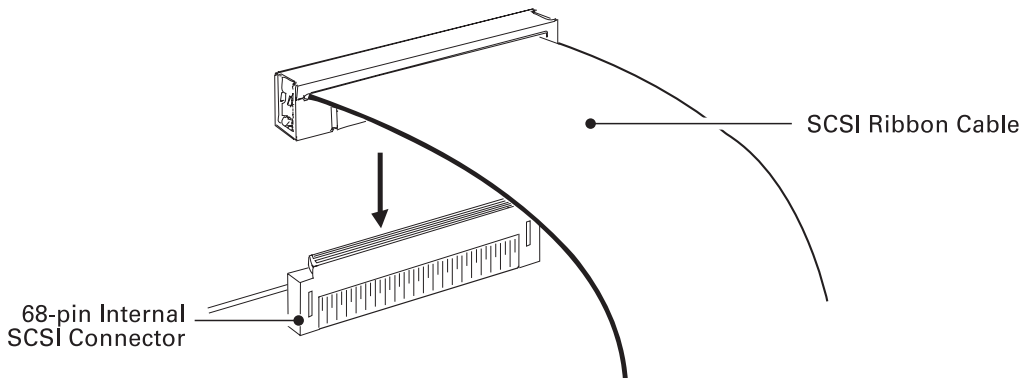


*FIGURE 8  /* Connecting the 68-pin Ultra2 SCSI cable

**4b  Installation of external SCSI devices**

Use the 68-pin external Ultra2 SCSI connector to connect your external Ultra2 peripherals.  Ultra2 external cables are not included in the kit.  Installation of external SCSI cables can be performed after the cover has been closed. The cable is limited in length to a total of 12 meters including any internal cabling. The external cable can be daisy chained to include up to 15 devices with the host adapter in combination with internal devices. The external cable is designed to be inserted only one way, requiring termination at the end peripheral device (FIGURE 9).

Terminating Plug
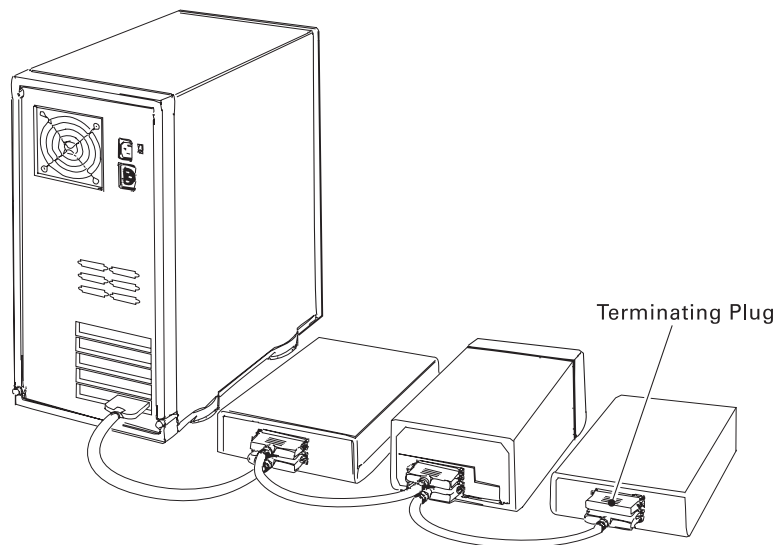
*FIGURE 9*  / External cable connection

**NOTE:**
**We recommend keeping your Ultra2 peripherals seperate from your non-Ultra2 peripherals.  Connecting a non-Ultra2 peripheral to the Ultra2 SCSI connector forces the Ultra2 SCSI segment and any attached peripherals to drop down to UltraSCSI performance levels (40 MBytes/sec).**

To increase the reliability of the cabling being used with the host adapter, it is recommended that the following guidelines be observed:

• SCSI-1 – Cabling up to 6 meters (20 feet)
• UltraSCSI – Four devices, up to 3 meters (10 feet)
• UltraSCSI – Eight devices, up to 1.5 meters (5 feet)
• Ultra2 (point-to-point configuration) – Up to 25 meters (82 feet)
• Ultra2 (multiple interconnect config) – Up to 12 meters (39 feet)
• Impedance of the cable should be 120 (±8 ohms); Ultra2
• Impedance of the cable should be 90 (±8 ohms); UltraSCSI & FastSCSI.
• Use high quality shielded connectors for external devices.

**5    Drive activity LED**

A drive activity LED is designed into the host adapter to indicate when a data transfer is being made.  Connection to the LED is optional and cabling is not included with this kit.  Each host adapter has one four-pin connector.  Please refer to the host adapter's illustration (FIGURE 10) for the LED connector that will accomodate the LED cable.
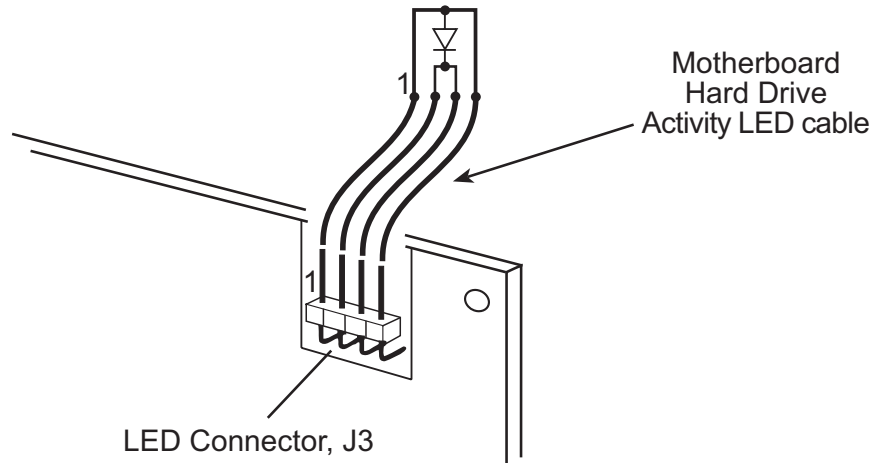


*FIGURE 10* / Connecting to the motherboard LED

**6    Close the cover on the host computer**

Visually inspect the configuration you have installed to verify that all cables have been inserted correctly.  Close the cover on the host computer.  The hardware installation for the host adapter is now complete.

**7    Host computer configuration**

Most computer manufacturers with a PCI bus automatically configure the add on-card or host adapter I/O Port address, IRQ Setting and BIOS address. If this is not the case with your computer system, you will need to manually configure your system.

There are two means of configuring the PCI bus from the host computer system:

1.  Setting jumpers on the host system motherboard.
2.  Setting CMOS BIOS incorporated into the host system.

You will need to refer to the host computer system documentation to complete PCI bus activation and setup.

If the host system will be using a SCSI device to provide system boot capability, then the system CMOS drive type settings may need to be changed.  Under some conditions the system will expect the boot disk to be an IDE drive.  This must be changed in order to boot from a SCSI device.

# 3. Hardware Installation

**8  System startup**

The newly installed SCSI bus is now ready to power up. Switch on peripheral and host computer system power. The system monitor should display the following information, but may vary, based on the system BIOS manufacturer.

• The normal Power-On Self Test and memory test procedure.

• The host adapter sign on message including a list of attached SCSI devices.

The list should match the peripheral devices attached to the bus. In most cases the host computer system is now configured and ready for use.

Some situations will require that a low-level format be performed using the host adapter SmartSCSI Setup Utility to initialize a SCSI disk drive and lay the foundation for a bootable SCSI drive.

**9  SmartSCSI Setup Utility**

The SmartSCSI Setup Utility simplifies the SCSI installation process by eliminating the need for opening the system to change system jumpers and switch settings. All necessary host adapter functions are accessible through the utility, simplifying customization for your system needs. ASUS's SmartSCSI Setup Utility is divided into five segments identified by: *Scan Bus; Device Setup; Adapter Setup; BIOS Setup; and Disk Utility*. These program functions are accessible by typing <CTRL><I> at the boot-up prompt when the message comes to view.

# Hard Disk Drive Preparation

A new SCSI disk drive is normally low-level formatted at the factory to simplify installation. Every SCSI hard disk drive must be physically low-level formatted, partitioned, and logically formatted before it can be used to store data. SCSI hard disks are physically low-level formatted at the factory and do not usually need to be formatted again.

If you connect a newer SCSI hard disk drive to your SCSI card, you must partition and logically format the drive. For DOS and Windows (3.x and 95) use the DOS Fdisk and Format commands (see your computer, DOS, and Windows documentation). For other operating systems, see your operating system documentation.

If you are booting from a SCSI hard disk drive, make sure the Hard Disk (or Drives) setting in your computer's CMOS setup program is set to None or No Drives Installed, as is required for SCSI hard disk drives. See your computer documentation for details.

# 3. Hardware Installation

If both SCSI and non-SCSI (for example, IDE) disk drives are installed, then the non-SCSI disk drive is typically the boot drive. If your computer supports BBS (BIOS Boot Specification), both SCSI and non-SCSI disk drives can coexist and you can specify which drive to boot from. Refer to your computer documentation for more information.

## Low-level Format

A low-level format will erase any data that is stored on the target disk. Before attempting to perform a low-level format be sure the data on the target disk has been backed up. A low-level format can be achieved via the SmartSCSI Setup Utility for PCI-SIU2.

The low level format sets the media to a state which is easily recognized by the host adapter on the SCSI bus. Once this format is completed, you will need to partition the drive. Refer to your operating system documentation for further information on partitioning drives.

## Multiple Initiators & Clustering

A multiple initiator environment is one in which the SCSI bus has two or more host adapters. To work in a cluster, the host adapters must perform properly in such an environment by not resetting the bus without an explicit host command, for example. ASUS's host adapters are built for multi-initiator operation and adhere strictly to the SCSI standard.

FIGURE 11 illustrates the principal components in a cluster's I/O system. It shows a simple cluster with two servers sharing access to online storage (the basic model for Microsoft's MSCS clusters). Both servers contain a host adapter that provides access to the shared external I/O bus. Servers can share disks or arrays attached to this shared I/O bus. The operating system controls contention for disk access by using either a component called a distributed lock manager (DLM) to resolve access conflicts or a shared-nothing model that partitions disks and arrays, giving each server control over a subset of the storage under normal circumstances. MSCS uses the shared-nothing approach.

Under some circumstances multiple initiators can be used on a single SCSI bus. The bus is configured to have more than one host adapter inserted into at least two distinctly different computer systems sharing peripheral devices. In these circumstances, it is possible to have one of the two computer systems turned off. Under these conditions,

the host adapter has a jumper that can be enabled (closed) to set the active on-board termination on all the time, regardless of whether power is applied or not. The host adapter is shipped without the jumper installed and need not be changed in most cases. Visually inspect the configuration you have installed to verify that all cables have been inserted correctly.
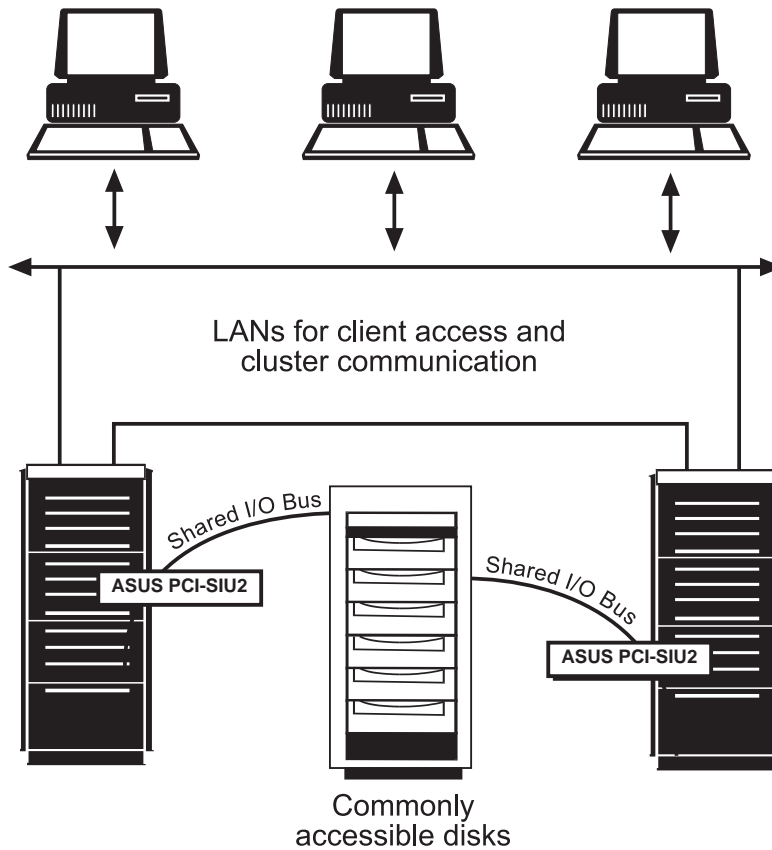


*FIGURE 11* / Simple multiple initiator model

*4*

# Running the SmartSCSI Setup Utility

To start the SmartSCSI Setup Utility, verify that all devices attached to the SCSI bus are powered up when the host computer system is turned on. Once the power switch has been turned on and the system begins its on screen power up sequence, the ASUS banner will be displayed for a brief period. During this time the ASUS SmartSCSI Setup Utility is accessible by pressing the **<Ctrl>** key and the letter**<I>** key at the same time. When displayed on your system monitor, the following message indicates that the SmartSCSI utility is ready to accept your keyboard input.

*!!! Press <Ctrl> <I> for SmartSCSI Setup Utility !!!*

```
           PCI Bus:00    Device:09H   Port:6100H    IRQ:11
  Scan Bus   Device Setup     Adapter Setup     Bios Setup      Disk Utility


  SCSI Device ID            #0     #1     #2     #3     #4     #5     #6     #7
  Asynchronous Transfer     No     Yes    Yes    No     No     Yes    Yes    No
  Max. Synchronous Transfer 80.0   80.0   80.0   80.0   80.0   80.0   80.0   80.0
  DOS Space > 1GB           Yes    Yes    Yes    Yes    Yes    Yes    Yes    Yes
  Spin Up Disk Drive        No     No     No     No     No     No     No     No
  Enable Disconnect         Yes    Yes    Yes    Yes    Yes    Yes    Yes    Yes
  Enable Wide Negotiation   Yes    Yes    Yes    Yes    No     No     No     No


  SCSI Device ID            #8     #9     #10    #11    #12    #13    #14    #15
  Asynchronous Transfer     No     Yes    Yes    No     No     Yes    Yes    No
  Max. Synchronous Transfer 80.0   80.0   80.0   80.0   80.0   80.0   80.0   80.0
  DOS Space > 1GB           Yes    Yes    Yes    Yes    Yes    Yes    Yes    Yes
  Spin Up Disk Drive        No     No     No     No     No     No     No     No
  Enable Disconnect         Yes    Yes    Yes    Yes    Yes    Yes    Yes    Yes
  Enable Wide Negotiation   Yes    Yes    Yes    Yes    No     No     No     No


      ESC:Exit   ↓→↑←:Select    +:Change Value  F8:Load Defaults
```

*FIGURE 12* / SmartSCSI's menu driven interface

# 4. Host Adapter Setup

## Main Menu Options

SmartSCSI's main menu provides five possible setup options for meeting your system configuration:

```
Scan Bus   Device Setup    Adapter Setup    Bios Setup    Disk Utility
```

## Scan Bus

Choosing this option results in the host adapter utility to scan the SCSI bus to determine peripheral devices attached to the host adapter. All device ID's are displayed on the screen including SCSI ID's *without* devices attached. This allows for a better definition of location and priority on the SCSI bus.

- A device ID should only be changed if it conflicts with another device address on the same bus. Refer to your peripheral documentation for changing SCSI ID's.
- The best ID for a *bootable hard disk is SCSI ID-0.*

## Device Setup

**Asynchronous Transfer.** Use this option to set the synchronous data transfer mode. PCI-SIU2 will transfer data at a maximum rate of 80 MBytes per second in synchronous mode and a maximum rate of 10 Mbytes per second in asynchronous mode. Use this option to set the synchronous data transfer mode. The default setting for this option is for synchronous operation. (No)

**Maximum Synchronous Transfer Rate.** This option determines the speed at which data is moved across the SCSI cable. PCI-SIU2 has the option of running from 80 MBytes per second in synchronous mode.

**DOS Space > 1 GB.** Using this option allows for single disk capacities to be extended up to 8 GBytes (Yes). Please refer to the Troubleshooting Section titled DOS Space > 1 GB for further information on this feature.

- (NO) DOS limits the number of cylinders per drive to 1024. The host adapter defines head and sector usage to 64 heads and 32 sectors. This format allows for maximum capacity of 1 gigabyte per disk storage.

- (YES) The upper limit can be extended from 1 GByte to 8 GBytes by increasing the number of heads to 255 and number of sectors used per track to 63. **NOTE: This is a powerful option. Data can be lost by changing settings.**

# 4. Host Adapter Setup

**Spin Up Disk Drive.** This option is used to initiate motor spin-up for SCSI disk drives. The host adapter BIOS can limit system power requirements during power-up. This is accomplished by signaling the device to start at delayed intervals (default setting will be 'No').

**Enable Disconnect.** The host adapter uses this option to allow a device to temporarily disconnect from the SCSI bus (referred to as disconnect/reconnect). This allows the host adapter to perform other functions on the bus while the device is temporarily disconnected. The device and the host adapter can then reconnect when the bus is needed (default setting will be 'Yes').

**Enable Wide Negotiation.** This option determines whether the host adapter initiates wide data transfer with the specified SCSI device. However, not all SCSI devices can handle wide data transfer negotiations properly, which may cause system failure. Certain old CD-ROM, CD-Recordable, and tape drives cannot handle a Wide Transfer negotiation request from the PCI-SIU2 and may fail to start the system. In such cases, use SmartSCSI to disable (NO check) the Wide Negotiation setting for the SCSI ID of the anomalous device.

## Adapter Setup

**Host Adapter SCSI Bus ID**. Used to change the adapter's SCSI ID on the SCSI bus. The narrow host adapters provides eight ID's available numbered 0-7, with 7 having the highest priority (and ID-7 reserved for the host adapter).

Installation of multiple host adapters is permitted on the same SCSI bus. This option allows the system to have more than one SCSI bus attached. Under these conditions, SCSI ID's must be mutually exclusive.

**SCSI Terminators**. This option is used to set host adapter termination located on the host adapter card. This option is also used to manually control termination on the host adapter. The normal setting for this option is auto.

**SCSI Parity Check ON**. Select this option to enable or disable parity checking on the SCSI bus by the host adapter. The default setting for this option is ON (Yes).

# 4. Host Adapter Setup

## BIOS Setup

**Enable Host Adapter BIOS.** This option controls the host adapter usage of SCSI disk I/O routines inside the host adapter BIOS. By disabling this option you will eliminate the host adapter's ability to utilize boot capabilities in PCI-SIU2. Setting this to "no" will also disable all subsequent features displayed by this on-screen panel. The default setting will be on. (Yes)

**Boot Device ID.** This option selects which SCSI device will be the designated boot device for the system. The default ID for this option is 0.

**BIOS Support for Bootable CD-ROM.** This option allows users to boot from a bootable CD by replying with *Yes* at the prompt. Only one bootable CD-ROM will be allowed at a time. The default setting will be off. (No)

**BIOS Treat Removable Disks as Fixed Disk.** This option is able to treat removable disks as fixed disks. With this option selected you can run removable disk media without additional software drivers. The default setting will be off. (No)

## Disk Utility

*These functions will be displayed when a device has been highlighted. Once a menu has been pulled up, the host adapter will scan all devices and display all necessary information. Selecting a device allows you to perform either of these two following actions:*

**Verify Disk.** This option will verify the media of a successfully formatted device and verify that the drive is functioning properly. Verify will also identify and flag any bad sectors on the disk so that during operation these flagged sectors will not be used. If a bad sector is found you are given two options shown below:

 • **Reassign** will assign the flagged location to another sector on the disk.
 • **Skip** will not reassign the flagged location.

**Format Disk.** Use this option to perform a low level disk format on the target device. The format will erase all data resident on the targeted disk drive. Refer to the section titled "Hard Drive Preparation" for additional information.

CAUTION:    **A low-level format destroys all data on the drive. Be sure to back up your data before performing this operation. You *cannot* abort a low-level format once it has started.**

*5*

## Overview

The ASUS ASPI driver will support extended SCSI command functions for MS-DOS 3.30 or later. The on-board BIOS initialized during the power up boot routine only supports MS-DOS hard disk operation. If peripherals other than disks are used, such as CD-ROM or MO, the ASUS ASPI driver will need to be installed in addition to ASUS CD-ROM and MO drivers.

## Installation

The installation procedure guides you through the installation of the ASUS DOS ASPI. The installation procedure described here requires some experience in MS-DOS setup and administration. The device driver is transferred from the **PCI-SIU2 DRIVER DISK** to the hard drive where it is automatically initialized during the system boot routine.

The **PCI-SIU2 DRIVER DISK** contains one installation program that perform the same task.

### Installing the ASPI drivers to an existing MS-DOS system

The ASPI driver is found on the **PCI-SIU2 DRIVER DISK** . It is important that the SCSI bus hardware, and operating system are installed correctly before proceeding further. If you need help installing the MS-DOS operating system, please refer to the MS-DOS manual before proceeding.

1. Turn on host system and boot into MS-DOS.

2. Insert the **PCI-SIU2 DRIVER DISK** into your floppy drive.

3. At the MS-DOS prompt, change to your active floppy drive (e.g., type **A: <ENTER>**).

4. Type **DOSSETUP <ENTER>** (*A series of screens will guide you through the installation of the ASPI device drivers*).

# 5. MS-DOS Driver Installation

**5** The first screen sets the installation drive and directory that the ASPI driver will be installed on. Follow the on-screen directions and/or options to continue the installation.

**6** To activate the device driver, reboot the system by selecting the **Reboot Now** option at the end of the installation process.

## ASPI Manager Command Line Options

Below is a list of command line options. The ASUS ASPI Manager, ASPIA100, supports command line switches to optimize driver operation. From inside the CONFIG.SYS file for MS-DOS, use the following format when modifying the device driver switches:

**The standard format for command line switches is:**

**Device = C:\INIASPI\ASPIA100.SYS [Driver Config Option]**

/D          Verbose Mode provides detailed information about the driver on system command line when the driver is initialized.

/L          Driver scan eight LUNs for each SCSI Target.

/Bb,dd      Scan device only on PCI BUS #b, PCI DEVICE #dd

            The range for "b" is from 0 to 7.

            The range for "dd" is from 0 to 20.

/Bb         Scan all the devices on the PCI BUS #b
            The range for "b" is from 0 to 7.

/Sdd        Scan device only on the PCI BUS #0 and device #dd
            The range for "dd" is from 0 to 20.

/CCBSx      Defines the maximum number of concurrent I/O that driver supports. The range for "x" is from 1 to 16.

# 5. MS-DOS Driver Installation

## ASPI CD-ROM Driver Command Line Options

**INICD.SYS** is a DOS device driver for supporting SCSI CD-ROM drives. It is the interface between MSCDEX.EXE (supplied by Microsoft®) and the physical CDROM drive. INICD.SYS is automatically loaded in the CONFIG.SYS start up file by the ASUS DOSSETUP or SETUP programs. INICD.SYS requires that the ASUS ASPI Manager be loaded. INICD.SYS can be loaded with either the DEVICE= or DEVICEHIGH= command. INICD.SYS can be found on **PCI-SIU2 DRIVER DISK**. Below is a list of command line options and examples.

**/D: /d:**      This option is used to specify the name of the device driver. The name specified must also be passed to MSCDEX.EXE on it's command line (Using the same **/D:** or **/d:** option). The name specified must be 8 or less characters in length. Valid characters are the A-Z, a-z, 0-9 and underscore. The name must start with a letter.

         Examples:      /D:INICD001

                                 /d:mscd001

                                 /d:MYCD01

**/T /t**      This option is used to specify a Time out value to be used when sending commands to a CDROM drive. If a CDROM drive does not respond to a command within the specified time out then the command will be aborted and an appropriate error message will be displayed. The time out value is specified in minutes. Valid values are 1-9 and D or d. The D or d values are used to Disable the time out mechanism. If the time out mechanism is disabled then faulty hardware can lock up the system.

         Examples:      /T4

                                 /Td

                                 /TD

                                 /T1

# 5. MS-DOS Driver Installation

**/X /x**    This option is used to exclude particular CD-ROM drives. Excluded CDROM drives are identified by specifying the host adapter, target id and lun. These values are spereated by a colon. Groups of CDROM drives (or wild cards) can also be identified. Below are examples of the different ways CDROM drives can be excluded:

/X0:1:2

This will exclude the drive on Host Adapter 0, with target ID 1 and lun 2.

/X0:2

This will exclude the drive on Host Adapter 0, with target ID 2 and ANY lun

/X0

This will exclude ALL drives on Host Adapter 0.

## Sample CONFIG.SYS and AUTOEXEC.BAT Files

These samples assume that the user has loaded the ASUS drivers in the following directory: c:\iniaspi.

*Config.sys:*
DEVICEHIGH=c:\iniaspi\aspia100.sys
DEVICEHIGH=c:\iniaspi\inicd.sys /D:INICD001

*Explanation:*
The first line loads the ASPI manager and the second line loads the CDROM driver specifying the device name INICD001.

*Autoexec.bat:*
C:\INIASPI\Mscdex /D:INICD001

*Explanation:*
This line will load the Microsoft supplied mscdex.exe file instructing it to attach to the CD-ROM device driver INICD001. Setup copies Mscdex to the C:\INIASPI directory during installation.

# 5. MS-DOS Driver Installation

## ASPI Disk Driver Command Line Options

**INIDISK.SYS** is a DOS block device driver for supporting SCSI fixed disks, removable disks and MO devices. INIDISK.SYS is automatically loaded in CONFIG.SYS start up file by the ASUS DOSSETUP or SETUP programs. INIDISK.SYS requires that the ASUS ASPI Manager be loaded. INIDISK.SYS can be loaded with either the DEVICE= or DEVICEHIGH= command. INICD.SYS can be found on the **PCI-SIU2 DRIVER DISK 1**. Below is a list of command line options and examples.

**/R /r**   This option specifies the number of *logical* drives to reserve for MO and removable disk devices. MO and removable disks media are capable of being partitioned just like a fixed disk. For every DOS partition on the media a logical DOS drive letter will be available. INIDISK.SYS will support as many logical drives as required (up to the maximum supported by DOS) based on the partitioning of the media that is present when your system boots. However, the media may be removed at any time and a new disk may be inserted. The new disk may have more (or less) partitions then the original disk. The **/R /r** option is used to reserved drive letters at start up in order to facilitate a disk change to a disk with more partitions than the original disk present at boot time. The value after the **/R /r** option determines how many drive letters will be reserved on a device basis. For example, if the user specifies a **/R4** option and there are two removable devices attached to the SCSI bus, then a total of eight (8) drive letters will be reserved.

**/T /t**   This option is used to specify a Time out value to be used when sending commands to a SCSI drive. If a SCSI drive does not respond to a command within the specified time out then the command will be aborted and an appropriate error message will be displayed. The time out value is specified in minutes. Valid values are 1-9 and D or d. The D or d values are used to Disable the time out mechanism. If the time out mechanism is disabled then faulty hardware can lock up the system.

Examples:      /T4
                        /Td
                        /TD
                        /T1

**/X /x**     This option is used to exclude particular SCSI drives. Excluded SCSI drives are identified by specifying the host adapter, target id and lun. These values are spereated by a colon. Groups of SCSI drives (or wild cards) can also be identified. Below are examples of the different ways SCSI drives can be excluded:

/X0:1:2

This will exclude the drive on Host Adapter 0, with target ID 1 and lun 2.

/X0:2

This will exclude the drive on Host Adapter 0, with target ID 2 and ANY lun

/X0

This will exclude ALL drives on Host Adapter 0.

## SAMPLE CONFIG.SYS

These samples assume that the user has loaded the ASUS drivers in the following directory: c:\iniaspi.

*Config.sys:*
DEVICEHIGH=c:\iniaspi\aspia100.sys
DEVICEHIGH=c:\iniaspi\inicd.sys /R2

*Explanation:*
The first line loads the ASPI manager and the second line loads the SCSI disk driver specifying that a minimum of two drive letters be reserved for each MO and removable disk attached to the SCSI bus.

**ASPI Partition & Format Utility**
INIFDISK.EXE is a DOS ASPI partition and format utility. It requires the ASPIA100.SYS and INIDISK.SYS drivers to be loaded in order for it to function properly. INIFDISK.EXE is installed by the ASUS DOSSETUP or SETUP programs. Upon invocation, the initial screen will have two windows. The top window will list all of the SCSI devices installed in the system. The user can highlight a particular device by using the up and down arrow keys. The bottom window will display information about the device that is currently highlighted in the top window. Inifdisk.exe can partition and format any SCSI storage device that is not being controlled by the BIOS, this includes SCSI disks, magnetic optical drives, and removable media devices. INIFDISK will display two screens in which the bottom portion will explain all commands possible in the top window.

# 6. MS Win 95/95b (OSR2) Driver Installation

*6*

## Overview

PCI-SIU2 will support Microsoft Windows 95 and Windows 95B (OSR2) with the addition of a software driver. The installation procedure described here requires some experience in Windows 95 system setup and administration. The device driver is transferred from the **PCI-SIU2 Driver Disk 1** to the hard drive where it is automatically initialized during the system boot routine.

The following files are used for installation and will be found on the **PCI-SIU2 Driver Disk 1** in the A:\win95 directory:

> \WIN95\INIA100.MPD
> PCI-SIU2 SCSI Host Adapter Windows 95 miniport driver.

> \WIN95\INIA100.INF
> Windows 95 installation information file.

## Installation

The PCI-SIU2 driver developed for Windows 95 is loaded during the system boot routine and will remain resident on the drive. This is accomplished by following one of the three installation procedures listed:

- New Windows 95 and Windows 95B (OSR2) installation.

- Adding the ASUS Windows 95 device driver to an existing Windows 95 or Windows 95B (OSR2) system.

- Updating INIA100.MPD device driver

The procedures described to make changes to the system have distinct differences. It is strongly suggested that the selected procedure be read and understood before proceeding with the system configuration changes. Please read the instructions carefully.

To determine which version of Windows 95 you have installed on your system, check the date of the KRNL32.DLL file located in your Windows directory. A file date of 07/11/95 belongs to Windows 95, first release; 12/31/95 belongs to Windows 95a or 95 with Service Pack 1; 08/24/96 reflects Windows 95b or OSR2.

# 6. MS Win 95/95b (OSR2) Driver Installation

## New Windows 95/95a Installation

These instructions will guide you through the installation of the ASUS host adapter driver while installing Windows 95. Windows 95 will be installed from either a CD-ROM or floppy diskettes. It is important that the hardware and DOS 4.01 or higher have been installed successfully before proceeding further. If installing from a SCSI CD-ROM drive, it is important that the ASUS ASPI driver, and CD-ROM driver be installed before proceeding further.

**1**   Access the Windows 95 CD-ROM from either the DOS prompt or from Microsoft Windows 3.x File Manager. Execute the SETUP.EXE program and follow the instructions on your screen. If you are installing from floppy diskette, insert the Windows 95 Setup Disk 1 in your floppy disk drive and boot your system. Follow the instructions on your screen.

**2**   Once a Windows 95 session is established, use your installed mouse or the appropriate key strokes to select **MY COMPUTER** from the MAIN DESKTOP. Execute the following steps:

   • Select **CONTROL PANEL** from within the MY COMPUTER icon.

   • Select **SYSTEM** from within the CONTROL PANEL group

   • Select **DEVICE MANAGER** tab from within the SYSTEM group

   • Select the **OTHER DEVICES** category from within the DEVICE MANAGER listing.

   • Select the **PCI-SCSI Bus Controller** sub-category from within the OTHER DEVICES listing.

   • In the PCI-SCSI Bus Controller Properties window, select the **DRIVER** tab**,** then select **"CHANGE DRIVER..."**.

   • In the SELECT HARDWARE TYPE window, select **SCSI CONTROLLERS**.

   • In the SELECT DEVICE window, select **"HAVE DISK..."**.

# 6. MS Win 95/95b (OSR2) Driver Installation

**3**  In the INSTALL FROM DISK window, enter the ASUS Driver path name:

- Insert the **PCI-SIU2 DRIVER DISK 1** into drive A:

- Type: **A:\WIN95**, select "**OK**"

**4**  Select **PCI SCSI Host Adapter**, select "**OK**", then "**OK**" again to install the INIA100.MPD driver onto your hard disk drive. *It may be necessary to direct Windows to look for the driver in A:\win95 before the driver can be copied. This step may need to be repeated more than once.*

**5**  Following installation of the ASUS PCI-SIU2 Windows 95 driver for all channels, reboot your system to activate the SCSI device driver.

**6**  It is highly recommended that the ASUS Windows 95 device driver has been properly installed by selecting **MY COMPUTER** from the desktop. Then select **CONTROL PANEL**:

- Select **SYSTEM** from within the CONTROL PANEL group,

- Select **DEVICE MANAGER** from within the SYSTEM group,

- Select **SCSI CONTROLLERS** from within the DEVICE MAN-AGER listing, and

- Select **PCI SCSI Host Adapter** from within the SCSI CONTROL-LER listing. If "This device is working properly" is displayed under Device Status, the driver has been correctly installed.

# 6. MS Win 95/95b (OSR2) Driver Installation

## Existing Windows 95/95a System

These instructions will guide you through the installation of the ASUS host adapter to an existing Windows 95 system. Windows 95 will automatically detect the presence of new hardware in Plug and Play compliant systems. It is important that the ASUS hardware has been properly installed before proceeding further.

**1**    Microsoft Windows 95 will detect the presence of new hardware upon boot-up and will display a dialog window titled NEW HARDWARE FOUND and PCI SCSI BUS CONTROLLERS will be highlighted.

- Select: **DRIVER FROM DISK PROVIDED BY HARDWARE MANUFACTURER**, then **"OK"**

- Select **SCSI CONTROLLER** from the list of available devices, then select **"HAVE DISK..."**

**2**    In the INSTALL FROM DISK window that is displayed, enter the ASUS Driver path name:

Insert **PCI-SIU2 Driver Disk 1** into drive A:

Type: **A:\WIN95**, select "**OK**"

**3**    Select **PCI SCSI Host Adapter**, select **"OK"**, then **"OK"** again to install the INIA100.MPD driver onto your hard disk drive. *It may be necessary to direct Windows to look for the driver in A:\win95 before the driver can be copied. This step may need to be repeated more than once.*

**4**    This completes loading the Host Adapter Driver. You must now reboot your system to activate the SCSI device driver. .

# 6. MS Win 95/95b (OSR2) Driver Installation

**5** It is highly recommended that you verify the ASUS PCI-SIU2 Windows 95 device driver by selecting **MY COMPUTER** from the desktop. Then select **CONTROL PANEL**:

- Select **SYSTEM** from within the CONTROL PANEL group,

- Select **DEVICE MANAGER** from within the SYSTEM group,

- Select **SCSI CONTROLLERS** from within the DEVICE MANAGER listing, and

- Select the **PCI SCSI Host Adapter** from within the SCSI CONTROLLER listing. If "This device is working properly" is displayed under Device Status, the driver has been correctly installed.

# 6. MS Win 95/95b (OSR2) Driver Installation

## Updating the ASUS Win 95/95a Device Driver

**1** Once a Windows 95 session is established, use your installed mouse or the appropriate key strokes to select **MY COMPUTER** from the Main Desktop. Execute the following steps:

- Select **CONTROL PANEL** from within the MY COMPUTER group.

- Select **SYSTEM** from within the CONTROL PANEL group.

**2** Select the **DEVICE MANAGER** tab from within the SYSTEM group.

- Select the **SCSI CONTROLLERS** category from within the DE-VICE MANAGER listing.

- Select one of the **PCI SCSI Host Adapter** sub-categories from within the SCSI CONTROLLERS listing (or select any other PCI-SIU2 class of drivers if you are using an older ASUS board).

- In the SCSI HOST ADAPTER PROPERTIES window, select the **DRIVER** tab**,** then select **"CHANGE DRIVER..."**.

- In the SELECT DEVICE window, select **"HAVE DISK..."**.

**3** In the INSTALL FROM DISK window, enter the ASUS Driver path name:

- Insert the **PCI-SIU2 Driver Disk 1** into drive A:

- Type: **A:\WIN95**, select "**OK**"

**4** Select **PCI SCSI Host Adapter**, select **"OK"** to install the INIA100.MPD driver onto your hard disk drive.

*It may be necessary to direct Windows to look for the driver in A:\win95 before the driver can be copied. This step may need to be repeated more than once.*

This completes updating the Host Adapter Driver. Follow the on-screen directions to restart you computer and activate the new driver.

# 6. MS Win 95/95b (OSR2) Driver Installation

It is highly recommended that you verify the ASUS PCI-SIU2 Windows 95 device driver by selecting **MY COMPUTER** from the desktop. Then select **CONTROL PANEL**:

• Select **SYSTEM** from within the CONTROL PANEL group,

• Select **DEVICE MANAGER** from within the SYSTEM group,

• Select **SCSI CONTROLLERS** from within the DEVICE MANAGER listing, and

• Select the **PCI SCSI Host Adapter** from within the SCSI CONTROL-LER listing. If "This device is working properly" is displayed on your screen, the driver has been correctly installed.

## New Windows 95B (OSR2) Installation

These instructions will guide you through the installation of the ASUS host adapter driver while installing Windows 95B (OSR2). Windows 95B will be installed from either a CD-ROM or floppy diskettes. It is important that the hardware and DOS 4.01 or higher have been installed successfully before proceeding further. If installing from a SCSI CD-ROM drive, it is important that the ASUS ASPI driver, and CD-ROM driver be installed before proceeding further.

**1**  Access the Windows 95B CD-ROM from the DOS prompt. Since OSR2 is never an upgrade version, you must do a new install from a DOS prompt. Execute the SETUP.EXE program and follow the instructions on your screen. If you are installing from floppy diskette, insert the Windows 95 Setup Disk 1 in your floppy disk drive and boot your system. Follow the instructions on your screen.

**2**  Once a Windows 95 session is established, use your installed mouse or the appropriate key strokes to select **MY COMPUTER** from the MAIN DESKTOP. Execute the following steps:

• Select **CONTROL PANEL** from within the MY COMPUTER group
• Select **SYSTEM** from within the CONTROL PANEL group,
• Select **DEVICE MANAGER** tab from within the SYSTEM group
• Select the **OTHER DEVICES** category from within the DEVICE MANAGER listing
• Select one of the **PCI-SCSI Bus Controller** sub-category from within the OTHER DEVICES listing

# 6. MS Win 95/95b (OSR2) Driver Installation

- In the PCI-SCSI Bus Controller Properties window, select the **DRIVER** tab**,** then select **"UPDATE DRIVER..."**
- Insert **PCI-SIU2 Driver Disk 1** into drive A:
- Select **YES**, click **Next**, and Windows will search for the driver
- Select the **OTHER LOCATION**
- Type **A:\WIN95**, then select "**OK**"
- Select "**FINISH**"
- At window "Insert Disk labled **PCI-SIU2 Driver Disk 1**", select "**OK**"
- At window titled "**Copying file**", replace the highlighted directory path with **A:\WIN95**, then select **"OK"** this will complete loading the INIA100.MPD driver onto your hard disk drive. This step may need to be done more than once.

**3** Following installation of the ASUS PCI-SIU2 Windows 95 driver, re-boot your system to activate the SCSI device driver.

**4** It is highly recommended that you verify Initio's Windows 95 device driver by selecting **MY COMPUTER** from the desktop. Then select **CONTROL PANEL**:

- Select **SYSTEM** from within the CONTROL PANEL group,

- Select **DEVICE MANAGER** from within the SYSTEM group,

- Select **SCSI CONTROLLERS** from within the DEVICE MAN-AGER listing, and

- Select the **PCI SCSI Host Adapter** from within the SCSI CON-TROLLER listing. If "This device is working properly" is displayed on your screen, the driver has been correctly installed.

This completes loading the Host Adapter Driver, follow the on-screen directions to complete the Windows 95 installation. Exit and reboot the system to activate the device driver.

# 6. MS Win 95/95b (OSR2) Driver Installation

## Existing Windows 95B (OSR2) System

These instructions will guide you through the installation of the ASUS host adapter to an existing Windows 95 system. Windows 95 will automatically detect the presence of new hardware in Plug and Play compliant systems. It is important that the ASUS PCI-SIU2 hardware has been properly installed before proceeding further.

1   Microsoft Windows 95 will detect the presence of new hardware upon boot-up and will display a dialog window titled "**update Device driver wizard**"

2   Insert the **PCI-SIU2 Driver Disk 1** into floppy drive,:

   • Select "**NEXT**"

   • Select the "**OTHER LOCATION"**

   • Type **A:\Win95**, then select "**OK**"

   • Select "**FINISH**"

   • At window "Insert Disk labled **PCI-SIU2 Driver Disk 1**", select "**OK**"

   • At window titled "**Copying file**", replace the highlighted directory path with **A:\Win95**, then select **"OK**" this will complete loading the INIA100.MPD driver onto your hard disk drive. Restart your computer. This step may need to be done more than once.

3   It is highly recommended that you verify the ASUS PCI-SIU2 Windows 95 device driver by selecting **MY COMPUTER** from the desktop. Then select **CONTROL PANEL**:

   • Select **SYSTEM** from within the CONTROL PANEL group,

   • Select **DEVICE MANAGER** from within the SYSTEM group,

   • Select **SCSI CONTROLLERS** from within the DEVICE MANAGER listing, and

   • Select the **PCI SCSI Host Adapter** entries from within the SCSI CONTROLLER listing. If "This device is working properly" is displayed on your screen, the driver has been correctly installed.

# 6. MS Win 95/95b (OSR2) Driver Installation

## Updating ASUS Win 95B (OSR2) Device Driver

1    Once a Windows 95 session is established, select **MY COMPUTER** from your desktop.  Execute the following steps:

- Select **CONTROL PANEL** from within the MY COMPUTER group

- Select **SYSTEM** from within the CONTROL PANEL group

- Select the **DEVICE MANAGER** tab from within the SYSTEM group

- Select the **SCSI CONTROLLERS** category from within the DE-VICE MANAGER listing

- Select the **PCI SCSI Host Adapter** sub-categories from within the SCSI CONTROLLERS listing

2    In the SCSI HOST ADAPTER PROPERTIES window, select the **DRIVER** tab**,** then select **"UPDATE DRIVER..."**

- Select "**Next**"

- Select the "**OTHER LOCATION"**

- Type **A:\WIN95**, then select "**OK**"

- Select "**FINISH**"

- At prompt "Insert Disk labled **PCI-SIU2 Driver Disk 1,**" select "**OK**"

- At prompt "Copying file", replace the highlighted directory path with **A:\win95**, then select **"OK."**  This will complete loading the INIA100.MPD driver onto your hard disk drive.

This completes updating the Host Adapter Driver.  Follow the on-screen directions to restart you computer and activate the new driver.

It is highly recommended that you verify Initio's Windows 95 device driver by selecting **MY COMPUTER** from the desktop.  Then select **CONTROL PANEL**:

- Select **SYSTEM** from within the CONTROL PANEL group,

- Select **DEVICE MANAGER** from within the SYSTEM group,

- Select **SCSI CONTROLLERS** from within the DEVICE MANAGER listing, and

# 7. Microsoft Windows 98 Driver Installation

# 7

## Overview

PCI-SIU2 will support Microsoft Windows 98 with the addition of a software driver. The installation procedure described here requires some experience in Windows 98 system setup and administration. The device driver is transferred from the **PCI-SIU2 Driver Disk 1** to the hard drive where it is automatically initialized during the system boot routine.

The following files are used for installation and will be found on the **PCI-SIU2 Driver Disk 1**:

> \WIN95\INIA100.MPD
> PCI-SIU2 SCSI Host Adapter Windows 95 miniport driver.
>
> \WIN95\INIA100.INF
> Windows 95 installation information file.

**NOTE: The PCI-SIU2 Windows 95 and Windows 98 drivers are identical**.

## Installation

The PCI-SIU2 driver developed for Windows 98 is loaded during the system boot routine and will remain resident on the drive. This is accomplished by following one of the three installation procedures listed:

- New Windows 98 installation.

- Adding the ASUS Windows 98 device driver to an existing Windows 98 system.

- Updating INIA100.MPD device driver

The procedures described to make changes to the system have distinct differences. It is strongly suggested that the selected procedure be read and understood before proceeding with the system configuration changes. Please read the instructions carefully.

# 7. Microsoft Windows 98 Driver Installation

## New Windows 98 Installation

These instructions will guide you through the installation of the ASUS host adapter driver while installing Windows 98. Windows 98 will be installed from either a CD-ROM or floppy diskettes. It is important that the hardware and DOS 4.01 or higher have been installed successfully before proceeding further. If installing from a SCSI CD-ROM drive, it is important that the ASUS ASPI driver, and CD-ROM driver be installed before proceeding further.

**1** Access the Windows 98 CD-ROM from either the DOS prompt or from Microsoft Windows 3.x File Manager. Execute the SETUP.EXE program and follow the instructions on your screen. If you are installing from floppy diskette, insert the Windows 95 Setup Disk 1 in your floppy disk drive and boot your system. Follow the instructions on your screen.

**2** Once a Windows 98 session is established, use your installed mouse or the appropriate key strokes to select **MY COMPUTER** from the MAIN DESKTOP. Execute the following steps:

- Select **CONTROL PANEL** from within the MY COMPUTER icon.

- Select **SYSTEM** from within the CONTROL PANEL group

- Select **DEVICE MANAGER** tab from within the SYSTEM group

- Select the **OTHER DEVICES** category from within the DEVICE MANAGER listing.

- Select the **PCI-SCSI Bus Controller** sub-category from within the OTHER DEVICES listing.

- In the PCI-SCSI Bus Controller Properties window, select the **DRIVER** tab**,** then select **"Change/Update Driver,"** then click **"Next".**

- SELECT **"Search"**.

- Check **"Specify a Location"**, enter **"A:\win95"**, and click **"Next"**.

# 7. Microsoft Windows 98 Driver Installation

**3**    In the INSTALL FROM DISK window, enter the ASUS Driver path name:

- Insert the **PCI-SIU2 Driver Disk 1** into drive A:

- Type: **A:\win95**, select **"OK"**

**4**    **PCI SCSI Host Adapter** driver will be displayed.  Click **"Next"** to install.

**5**    After the driver has been installed, click **"Finish"**

**6**    Following installation of the ASUS PCI-SIU2 Windows 98 driver for all channels, reboot your system to activate the SCSI device driver(s).

**7**    It is highly recommended that the ASUS Windows 98 device driver has been properly installed by selecting **MY COMPUTER** from the desktop.  Then select **CONTROL PANEL**:

- Select **SYSTEM** from within the CONTROL PANEL group,

- Select **DEVICE MANAGER** from within the SYSTEM group,

- Select **SCSI CONTROLLERS** from within the DEVICE MAN-AGER listing, and

- Select **PCI SCSI Host Adapter** from within the SCSI CONTROL-LER listing.  If "This device is working properly" is displayed under Device Status, the driver has been correctly installed.

# 7. Microsoft Windows 98 Driver Installation

## Adding PCI-SIU2 Driver to Existing Win 98

These instructions will guide you through the installation of the ASUS host adapter to an existing Windows 98 system. Windows 98 will automatically detect the presence of new hardware in Plug and Play compliant systems. It is important that the ASUS hardware has been properly installed before proceeding further.

**1** Microsoft Windows 98 will detect the presence of new hardware upon boot-up and will display a dialog window titled NEW HARDWARE FOUND and PCI SCSI BUS CONTROLLERS will be highlighted.

   • Select: **DRIVER FROM DISK PROVIDED BY HARDWARE MANUFACTURER**, then **"OK"**

   • Select **SCSI CONTROLLER** from the list of available devices, then select **"HAVE DISK..."**

**2** In the INSTALL FROM DISK window that is displayed, enter the ASUS Driver path name:

   Insert **PCI-SIU2 DRIVER DISK 1** into drive A:

   Type: **A:\WIN95**, select "**OK**"

**3** Select **PCI SCSI Controller**, select **"OK"**, then **"OK"** again to install the INIA100.INF driver onto your hard disk drive. *It may be necessary to direct Windows to look for the driver in A:\win95 before the driver can be copied. This step may need to be repeated more than once.*

**4** This completes loading the Host Adapter Driver. You must now reboot your system to activate the SCSI device driver.

**5** It is highly recommended that you verify Initio's Windows 98 device driver by selecting **MY COMPUTER** from the desktop. Then select **CONTROL PANEL**:

   • Select **SYSTEM** from within the CONTROL PANEL group,

   • Select **Device Manager** from within the SYSTEM group,

   • Select **SCSI Controllers** from within the Device Manager listing,

   • Select the **PCI SCSI Controller** from within the SCSI Controller listing. If "This device is working properly" is displayed under Device Status, the driver has been correctly installed.

# 7. Microsoft Windows 98 Driver Installation

## Updating the ASUS Win 98 Device Driver

**1**   Once a Windows 98 session is established, use your installed mouse or the appropriate key strokes to select **MY COMPUTER** from the Main Desktop.  Execute the following steps:

- From the Start Menu, go to Settings, and select **CONTROL PANEL**.

- Select the **SYSTEM** icon from within the CONTROL PANEL group.

**2**   Select the **DEVICE MANAGER** tab from within the SYSTEM group.

- Select the **SCSI CONTROLLERS** category from within the DE-VICE MANAGER listing.

- Select one of the **PCI SCSI Controllers** sub-categories from within the SCSI CONTROLLERS  listing (or select any other PCI-SIU2 class of drivers if you are using an older ASUS board).

- In the SCSI HOST ADAPTER PROPERTIES window, select the **DRIVER** tab**,** then select **"UPDATE DRIVER..."**.

- In the SELECT DEVICE window, select **"HAVE DISK..."**.

**3**   In the INSTALL FROM DISK window, enter the ASUS Driver path name:

- Insert the **PCI-SIU2 DRIVER DISK 1** into drive A:
- Type: **A:\win95**, select "**OK**"

**4**   Select **PCI SCSI Controller**, select **"OK"** to install the INIA100.INF driver onto your hard disk drive.

*It may be necessary to direct Windows to look for the driver in A:\win95 before the driver can be copied.  This step may need to be repeated more than once.*

This completes updating the Host Adapter Driver.  Follow the on-screen directions to restart your computer and activate the new driver.

It is highly recommended that you verify Initio's Windows 98 device driver by selecting **MY COMPUTER** from the desktop.  Then select **CONTROL PANEL**:

- Select **SYSTEM** from within the CONTROL PANEL group,

- Select **DEVICE MANAGER** from within the SYSTEM group,

# 7. Microsoft Windows 98 Driver Installation

- Select **SCSI CONTROLLERS** from within the DEVICE MANAGER listing, and

- Select the **PCI SCSI Host Adapter** from within the SCSI CONTROL-LER listing.  If "This device is working properly" is displayed on your screen, the driver has been correctly installed.

# 8. Microsoft Windows NT Driver Installation

**8**

## Overview

PCI-SIU2 will support Windows NT v3.5x/4.0 with the addition of a software driver. A software driver allows the host computer the ability to transfer data over the SCSI bus. The device driver for Windows NT is copied from the ASUS driver installation diskette to your hard drive where it is loaded onto the computing system during installation.

The following files are used for installation and may be found on the **PCI-SIU2 DRIVER DISK**:

> \WINNT\INIA100.SYS
> PCI-SIU2 SCSI Host Adapter Windows-NT miniport driver.

> \WINNT\TXTSETUP.OEM
> Script file for installing INIA100.SYS during the text setup phase.

> \WINNT\OEMSETUP.INF
> Script file for installing INIA100.SYS during the windows phase.

## Installation

The PCI-SIU2 driver developed for Windows NT will be installed on the hard drive used for system initialization. The driver is loaded during the system boot routine and will remain resident on the drive. This is accomplished by following one of the two installation procedures listed:

- New Windows NT installation

- Adding or updating the PCI-SIU2 Host Adapter Driver to an existing Windows NT System

The procedures described to make changes to the system have distinct differences. It is strongly suggested that the selected procedure be read and understood before proceeding with the system configuration changes. Please read the instructions carefully.

# 8. Microsoft Windows NT Driver Installation

## New Windows NT Installation

These instructions will guide you through the installation of the ASUS host adapter driver while installing Windows NT 4.0. Windows NT will be installed from either floppy diskettes or CD-ROM. The Windows NT driver is located on the **PCI-SIU2 DRIVER DISK 1**. It is important that the hardware has been installed successfully before proceeding further.

**1** If you are installing Windows NT from floppy diskettes, locate the Windows NT Disk 1 for Floppy Installation. Make a backup copy of this diskette before installation.

**2** If you are installing Windows NT from a CD version, locate the Windows NT Setup Disk for CD-ROM Installation. Make a backup copy of this diskette before installation.

**3** Insert the backup Windows NT Setup disk into drive A: and turn on your computer.

**4** Follow the instructions on the screen until you come to a window titled: *"WINDOWS NT WORKSTATION SETUP" (for servers, it will read "WINDOWS NT SERVER SETUP")*.

- Press **"ENTER"** to continue setting up Windows NT.

- Select **"S"** to skip mass storage detection.

- Select **"S"** to configure additional SCSI adapters.

**5** When prompted by the Windows NT installation, scroll down the list and select **"OTHER (Requires disk provided by a hardware manufacturer)"** from the list of Additional SCSI Adapters. A message will appear on screen stating to:

- Remove diskette in drive A and set it aside.

- Insert **PCI-SIU2 DRIVER DISK 1** and press **<ENTER>**.

- Select: **SCSI Host Adapter**, press **<ENTER>**.

**6** The ASUS host adapter driver is now installed The on-screen instructions will continue for a complete installation of Windows NT. Refer to your Windows NT users manual for completion of the operating system installation procedure.

# 8. Microsoft Windows NT Driver Installation

## Adding or Replacing a SCSI host adapter:

**NOTE: Windows NT requires that software drivers be loaded *before* proceeding with any hardware installation.**
If there is currently a SCSI host adapter installed in your system and it is not manufactured by ASUS Corporation, then you must follow these steps for proper installation:

**1**    Before installing the PCI-SIU2 card itself, load the ASUS drivers for Windows NT.  The driver is located on the **PCI-SIU2 DRIVER DISK 1**. Follow the instructions in the previous section labeled **New Windows NT Installation.**

**2**    Shut down the computer.

**3**    Install the PCI-SIU2 card in a slot other than that of the currently occupied PCI SCSI slot.

**4**    Reboot the computer.

**5**    Shut down the computer again (this allows the drivers to recognize the card).

**6**    Attach all cables/devices from previous SCSI card to Initio's PCI-SIU2.

**7**    If replacing, go into SCSI properties and remove drivers of old SCSI card.

**8**    It is highly recommended that you verify the ASUS PCI-SIU2 Windows NT device driver has been properly installed by selecting **MY COMPUTER** from the desktop.  Then select **CONTROL PANEL**:

   •   Select **SCSI ADAPTERS** from within the CONTROL PANEL group,

   •   Select **PCI SCSI Host Adapter** from within the SCSI CONTROLLERS listing.  If "This device is working properly" is displayed on your screen, the driver has been correctly installed.

# 8. Microsoft Windows NT Driver Installation

## Adding/updating ASUS driver to existing Win NT:

For computer systems using other SCSI host adapters or an IDE drive to provide the system boot routine, these instructions will guide you through the PCI-SIU2 host adapter driver installation. The Windows NT driver will be found on the **PCI-SIU2 DRIVER DISK 1**. It is important that the SCSI bus hardware and Windows NT are installed and configured before proceeding further.

1   Once a Windows NT session is established, use your installed mouse or the appropriate key strokes to select **MY COMPUTER** from the Main Desktop. Execute the following steps:

   •   Select **CONTROL PANEL** from within the MY COMPUTER group

   •   Select **SCSI ADAPTERS** from within the CONTROL PANEL group.

2   Select the **DRIVERS** tab from within the SCSI ADAPTERS group.

   •   In the DRIVERS window, select **"ADD…"**

3   In the INSTALL DRIVER window, select **"HAVE DISK..."**.

4   In the INSTALL FROM DISK window that is displayed, enter the ASUS Driver path name:

   •   Insert **PCI-SIU2 DRIVER DISK 1** into drive A:

   •   Type: **A:\WINNT**, select "**OK**"

5   Select **PCI SCSI Host Adapter**, select **"OK"** to install the INIA100.SYS driver onto your hard disk drive.

6   In the WINDOWS NT SETUP window that is displayed, enter the ASUS Driver path name to continue:

   •   Type: **A:\WINNT**, select "**CONTINUE**"

7   This completes updating the Host Adapter Driver. Follow the on-screen directions to restart you computer and activate the new driver

8   It is highly recommended that you verify the ASUS PCI-SIU2 Windows NT device driver has been properly installed by selecting **MY COMPUTER** from the desktop. Then select **CONTROL PANEL**:

# 8. Microsoft Windows NT Driver Installation

- Select **SCSI ADAPTERS** from within the CONTROL PANEL group,

- Select **PCI SCSI Host Adapter** from within the SCSI CONTROLLERS listing. If "This device is working properly" is displayed on your screen, the driver has been correctly installed.

## Installing a new Win NT & ASUS driver without disks

For computer systems installing or upgrading to Windows NT from a floppyless setup such as a share on your network, these instructions will guide you through the PCI-SIU2 host adapter driver installation. The Windows NT drivers are located on the **PCI-SIU2 DRIVER DISK**. It is important that the hardware has been installed successfully before proceeding further.

1    Execute a floppyless setup as described by the *Windows NT System Administrator's Guide*

2    When SETUP begins to load, the screen will turn from black to blue with the text "SETUP IS INSPECTING YOUR COMPUTER'S HARDWARE CONFIGURATION…" at the top

- Press the **F6** key to interrupt this process. You will have two seconds in which to press this key

- Follow the instructions on the screen until you are asked to specify a SCSI driver.

3    Insert the **PCI-SIU2 DRIVER DISK 1** into your local floppy disk drive, and press **<ENTER>**.

- Select: **PCI SCSI Host Adapter**

4    The ASUS host adapter driver is now installed

The on-screen instructions will continue for a complete installation of Windows NT. Refer to your *Windows NT System Administrator's Guide* for completion of the operating system installation procedure.

## Installing a new Win NT system from a Bootable CD

# 8. Microsoft Windows NT Driver Installation

For computer systems installing or upgrading to Windows NT from a bootable CD, these instructions will guide you through the PCI-SIU2 host adapter driver installation. The Windows NT driver will be found on the **PCI-SIU2 DRIVER DISK**. It is important that the hardware has been installed successfully before proceeding further.

**1**    Boot your system from a Windows NT CD.

**2**    When initial boot screen (Black and white screen prior to blue screen) shows the message, "Setup is inspecting your computers hardware configuration," press **F6**.

**3**    A setup screen will appear asking which drivers you wish to use.

**4**    Press the appropriate key to add driver and select other.

**5**    Windows NT will prompt you for a manufacturer's supplied disk.

**6**    Insert the ASUS manager set floppy (marked **PCI-SIU2 DRIVER DISK 1**) and press ENTER. The host adapter should be recognized by Windows NT and the driver will be allowed to load. The operating system will continue loading and should recognize the hard drives.

*9*

## Overview

PCI-SIU2 will support Novell NetWare 386 v3.1x, v4.1x, or v5.0 with the addition of a software driver. The installation procedure described here requires some experience in Novell system setup and administration. The device driver is transferred from the **PCI-SIU2 DRIVER DISK 1** to the hard drive where it is automatically initialized during the system boot routine. The device drivers listed can support NetWare versions described after the ASUS file name:

> \NETWARE\HAM\INIA100.HAM
> HAM device driver

> \NETWARE\HAM\INIA100.DDI
> HAM device driver installation file

## Installation

The drivers developed by ASUS for NetWare will be installed on the disk drive used for NetWare system initialization. It is strongly recommended that the selected procedure be read and understood before continuing with the system configuration or change. Please read the instructions carefully.

## The ReadMe File

The Novell Netware ReadMe.txt file on the **PCI-SIU2 DRIVER DISK 1** contains important updated information and corrections to this chapter. The successful installation of the ASUS driver will likely depend on the instructions given on the ReadMe text file.

## New IntraNetWare Installation

Drivers for the ASUS host adapter may be found on **PCI-SIU2 DRIVER DISK 1**. In most cases you will load the drivers during a new installation of NetWare from CD-ROM. The driver is loaded during the NetWare Server Installation procedure. The NetWare installation program will prompt you for the required parameters as the installation procedure progresses. It is highly recommended that you have a copy of the Novell NetWare Installation and Upgrade Manual for reference.

# 9. Novell NetWare Driver Installation

**1**    At the MS-DOS prompt for CD-ROM installation, change directories to where the installation files are located.e.g., **d:\ <ENTER>**

**2**    Type **INSTALL <ENTER>** to initialize the installation routine

**3**    Select installation Language. **<ENTER>**.

**4**    Select **NetWare Server Installation <ENTER>**

**5**    Select product type **<ENTER>**

**6**    Select installation type. **<ENTER>**

**7**    Enter server name when prompted **<ENTER>**

At this point the boot files will be copied to the hard drive.

**8**    After the files are finished being copied you may encounter the following message:

**Install found the following hardware but found more than one driver supporting this hardware**

**PCI.XXXX.XXXX.XXXX.XXXX.XX**

**Press <Enter> for a list of drivers to choose**

**From or <F3> to continue without selecting**

Press <F3> to continue. Repeat if this screen is shown again.

**9**    At the **Server Driver Summary Screen** choose **Select/ Edit Disk or LAN Drivers**

**10**    Highlight **Disk CD-ROM Drivers** and press <Enter>

**11**    Press **INS** followed by **F3**

**12**    Place the **PCI-SIU2 DRIVER DISK 1** in drive A: and press <Enter>

**13**    Highlight **INIA100.HAM** and press <Enter>

**14**    Highlight **Select/Modify Driver Parameters**

**15**    Enter slot number followed by **F10**

**16**    Highlight **Save parameters and continue** and press <Enter>

This will load the HAM driver. If a DSK driver is required or an updated HAM driver is needed it is recommended that you complete the installation and use NetWare's **INSTALL** utility to update/change the driver.

## Adding the ASUS driver to an existing IntraNetWare

1    To begin the installation you will need to change the directory to the location of the server and initialize the network server, e.g., Type **CD \ NWSERVER <ENTER>** Type **SERVER <ENTER>**

2    At the NetWare prompt, Type **LOAD INSTALL <ENTER>.**

3    Select **Driver Options** from the window by highlighting it using the UP or DOWN ARROW keys, press **<ENTER>**

- Select **Configure disk and storage device drivers** from the window by highlighting it using the UP or DOWN ARROW keys, press **<ENTER>**

4    Highlight **Discover and load additional drivers** and press **<ENTER>**

5    Press <Enter> to get list of available drivers

6    Press **INS** followed by **F3**

7    Insert **PCI-SIU2 DRIVER DISK 1** into the A: drive and press <Enter>

## Upgrading/Changing Driver on Existing IntraNetWare

1    To begin the you will need to change the directory to the location of the server and initialize the network server, e.g.,

Type **CD \ NWSERVER <ENTER>** Type **SERVER <ENTER>**

2    At the NetWare prompt, Type **LOAD INSTALL <ENTER>.**

3    Select **Driver Options** from the window by highlighting it using the UP or DOWN ARROW keys, press **<ENTER>**

- Select **Configure disk and storage device drivers** from the window by highlighting it using the UP or DOWN ARROW keys, press **<ENTER>**

4    Highlight **Deselect a selected driver** and press **<ENTER>**

5    Highlight the driver you wish to replace/upgrade and press **<ENTER>**

*Repeat steps 4 and 5 for each instance of the driver*

6    When all of the drivers you wish to upgrade/replace have been removed highlight **Select an additional driver** and press **<ENTER>**

7    Press **<INS>** followed by **<F3>**

**8**     Enter the location path of the drivers **A:\**

**9**     Select the driver you wish to load **INIA100.HAM** or **INIA100.DSK** and press **<ENTER>**

**10**    Highlight **Select and modify parameters** and press **<ENTER>** Enter the slot number and press **<F10>** to continue

**11**    Highlight **Save parameters and continue** and press **<ENTER>**

**12**    Repeat steps 6 through 11 for each additional adapter installed

# Device driver command line options

The ASUS device drivers support command line switches to optimize driver performance.  However, in certain situations some driver optimization may be advantageous to system performance.

NetWare offers two means of entering command line switches. One method is for session usage and needs to be entered each time the system is rebooted.

    **Load (Pathname) INIA100 [Driver Config Option]**

The second method listed is for permanent installation. In startup.ncf you can include the following statement.

    **Load (Pathname) INIA100 [Driver Config Option]**

# 9. Novell NetWare Driver Installation

## Driver Config Options:

/V          Verbose Mode provides detail information about driver on system command line when driver is initialized.

/!V         Non Verbose Mode (default)

/L          Driver assumes that all targets have more than one LUN

/!L         Driver assumes that all targets only have LUN 0 (default)

/T:xxxx     Target enable mask WORD (Default scan all targets)

/B:b,dd     Scan device only on PCI BUS #b, PCI DEVICE #dd

/B:b        Scan all the devices on PCI BUS #b (from 0 to 7)

/Q:q        Specifies maximum number of tag commands per target (default 4)

/!Q         No tag

/WR         Read after write, hardware verify

/!WR        Not verified (default)

/R          Support removable media (default)

/!R         Will not support removable media

/D          Enable support for fixed disk drive (default)

/!D         Disable support for fixed disk drive

# 10

## Overview

The PCI-SIU2 OS/2 driver will support OS/2, 3.0 & 4.0. The device driver for OS/2 is copied from the **PCI-SIU2 DRIVER DISK 1** to your hard drive where it is initialized during boot-up.

The installation of ASUS device drivers to support OS/2 include the following software files and may be found on the **PCI-SIU2 DRIVER DISK 1**:

\OS2\INIA100. ADD
PCI-SIU2 SCSI Host Adapter OS/2 driver.

\OS2\INIA100.DDP
Script file for installing INIA100.ADD

The ReadMe.txt file on the **PCI-SIU2 DRIVER DISK 1** contains important updated information not mentioned in this chapter. Successful installation of the ASUS driver will likely depend on the instructions given in the ReadMe text file.

## Installation

The PCI-SIU2 driver developed for OS/2 will be installed on the disk drive used for system initialization. The driver is loaded during the system boot routine and will remain resident on the drive. Installation of the drivers can be accomplished by following one of the procedures listed:

- New OS/2 Installation
- Adding PCI-SIU2 host adapter to existing OS/2

The steps used to install the ASUS drivers have different system requirements that may affect basic operation if not installed properly. It is strongly suggested that the selected procedure be read and understood before proceeding. Please read all instructions carefully.

# 10. OS/2 Driver Installation

## New OS/2 installation:

These instructions will guide you through the ASUS OS/2 device driver and OS/2 installation at the same time. The program can be installed from floppy diskettes or from CD-ROM. The OS/2 driver for the PCI-SIU2 will be found on the **PCI-SIU2 DRIVER DISK 1**. It is important that the PCI-SIU2 hardware has been installed successfully before proceeding further.

**1**  Make a duplicate copy of **OS/2 Diskette 1** using a blank diskette and label it as  "OS/2 Diskette 1 for PCI-SIU2".

**2**  Copy the **INIA100.ADD** file from the **PCI-SIU2 DRIVER DISK 1** (OS/2 sub-directory) to the root directory on the "OS/2 diskette 1 for PCI-SIU2".

**3**  Using an appropriate text editor modify the CONFIG.SYS on the OS/2 Diskette 1 for PCI-SIU2 to include the new ASUS driver.

Enter:  **BASEDEV=INIA100.ADD** and save the file.

\* \* \* note place lines after 'set os2_shell=cdint.exe' \* \* \* BASEDEV=INIA100.ADD set copyfromfloppy=1

**4**  Insert the **Installation Diskette** into drive A: and turn on your computer.  This will begin the OS/2 installation and establish an OS/2 bootable hard drive.

**5**  When prompted, insert the "OS/2 Diskette 1 for PCI-SIU2."  Follow the on-screen instructions to continue.

**6**  You have completed the ASUS device driver installation for OS/2. Follow the on-screen instructions and OS/2 manual for a complete description of OS/2 installation.

# 10. OS/2 Driver Installation

## Adding the driver to an existing OS/2 system

For computer systems using other SCSI host adapters or an IDE device to provide the system boot routines, these instructions will guide you through PCI-SIU2 host adapter driver installation. The OS/2 driver will be found on the **PCI-SIU2 DRIVER DISK 1**. It is important that the SCSI bus hardware and OS/2 are installed correctly before proceeding further.

1    Once an OS/2 session is established, insert the **PCI-SIU2 DRIVER DISK 1** into your floppy drive.

2    By using your installed mouse, or by using the appropriate key strokes, select **DEVICE DRIVER INSTALL** from the SYSTEM SETUP group.

3    Select **CHANGE** source directory to read as the root directory.

4    Select **OS2** and select **SET.**

5    Select **DESTINATION DIRECTORY**.

6    Select **CHANGE** destination directory to any existing OS/2 directory or accept the default.

7    Select **SET.**

8    From the DEVICE DRIVER INSTALLATION GROUP select **INSTALL**.

9    Select **PCI SCSI Device Driver for OS/2** select **"OK"**.

10   Select **EXIT** to install the OS/2 device driver. Exit and reboot the system to activate the device driver.

## Device driver command line options

The ASUS device drivers support command line switches to optimize driver performance. Device drivers normally require no further information to work effectively. However, in certain situations some driver optimization may be advantageous to system performance. From inside the CONFIG.SYS file use the following format to edit the file.

The standard format for command line switches is:

    **BASEDEV = INIA100.ADD [Driver Config Option]**

ASUS PCI-SIU2 User's Manual

# 11. SCO Unix Driver Installation

# *11*

## Overview

The PCI-SIU2 SCO UNIX device driver will support SCO UNIX System V/ 386 Release 3.2v4.0 or later, SCO Open Desktop v2.0, v3.0 or later, and SCO Open Server Release 3.0 & 5.0.x.  The device driver is transferred from the floppy diskette to the hard drive where it's loaded during system initialization.

The installation of ASUS device drivers to support SCO UNIX include the following software files and may be found on the **INI-9XXXU/9XXXUW DRIVER DISK 2**.

> Driver.o
> Device driver object file
> Space.c
> Device driver definition file

### Reference Documentation:

> • SCO UNIX documentation, installation and user's guide
> • The systems setup and installation guide
> • The documentation for system peripherals
> • ASUS documentation for the SCSI host adapter

The ReadMe.txt file on the **PCI-SIU2 DRIVER DISK 2** contains important updated information not mentioned in this chapter.  Successful installation of the ASUS driver will likely depend on the instructions given in the ReadMe text file.

## Installation

The SCO UNIX drivers developed by ASUS will be installed on the disk drive used for system initialization.  It is strongly suggested that the selected procedure be read and understood before continuing with the system configuration or change.  Please read the instructions carefully.

# 11. SCO Unix Driver Installation

## Updating interrupts & hardware settings

The following interrupt configuration settings are suggested as the most effective means of providing a controller interrupt to the host adapter:

- Host Adapter interrupt levels available are 9,11, 15, (IRQ 11 is recommended)
- Avoid using interrupt 10 as the controller interrupt.
- Set first SCSI disk ID to 0 (first time install requirement)
- Set tape target ID to 2. (If tape is in use)
- Set CD-ROM target ID to 5. (If CD-ROM is in use)

Please Refer to your system documentation to set the interrupt levels and your peripheral documentation for help in setting SCSI IDs.

### Installing the PCI-SIU2 in a new SCO UNIX system

**1** Insert the SCO UNIX N1 boot disk into the floppy drive and turn on the system.   At the SCO UNIX boot prompt, type: **link < ENTER >**.

**2** The system will ask you what packages you want linked to the system; type: **a10 < ENTER >**.  The system at this point will boot into SCO UNIX.  Please refer to the SCO UNIX Documentation for additional information.  When prompted by the installation, insert the **PCI-SIU2 DRIVER DISK 2** diskette into your floppy drive; Press **< ENTER >**

**3** Please refer to the SCO UNIX Documentation for additional information.  You have completed the installation of the SCO UNIX driver.

### Adding the ASUS driver to an existing SCO UNIX

**1** Insert the **PCI-SIU2 DRIVER DISK 2** diskette into your floppy drive.

**2** Type: "**installpkg**" under the command prompt, <**ENTER**>

**3** The system will ask you what packages you wish to install.

Type: **a10 < ENTER >**

**4** Change the directory and rebuild the UNIX kernel:

- **cd /etc/conf/cf.d  < ENTER >**
- **. /link_unix       < ENTER >**

**5** You have completed the link procedure for the ASUS device driver. Exit and reboot the system.

# 11. SCO Unix Driver Installation

Changing to the PCI-SIU2 as the bootable host adapter:

**1** Insert the **PCI-SIU2 DRIVER DISK 2** diskette into floppy drive.

**2** Type: "**installpkg**" under command prompt and press <**ENTER**>. The system will ask you what packages you want to install.

- Type: **a10 <ENTER>**

**3** Change the mscsi file:

- **cd /etc/conf/cf.d  < ENTER >**

- **cp mscsi mscsi.bak  < ENTER >**

- **vi mscsi  < ENTER >**

In the example below, The XXXX would be replaced with **a10**.

| ha | attach | number | ID | lun | bus |
|------|--------|--------|-----|-----|-----|
| XXXX | Stp | 0 | 2 | 0 | 0 |
| XXXX | Sdsk | 0 | 0 | 0 | 0 |
| XXXX | Srom | 0 | 5 | 0 | 0 |

**4** Rebuild the UNIX kernel:

- **. /link_unix < ENTER >**

**5** You have completed the link procedure for the ASUS device driver. Exit and reboot the system.

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## Overview

The PCI-SIU2 SCO UnixWare device driver will support UnixWare 2.1x. The device driver is transferred from the floppy diskette to the hard drive where it is loaded during system initialization.

The installation of ASUS device drivers to support SCO UnixWare may be found on the **PCI-SIU2 DRIVER DISK 2**.

The ReadMe.txt file on the **PCI-SIU2 DRIVER DISK 2** contains important updated information not mentioned in this chapter. Successful installation of the ASUS driver will likely depend on the instructions given in the ReadMe text file.

## Installation

The SCO UnixWare drivers developed by ASUS will be installed on the disk drive used for system initialization. It is strongly suggested that the selected procedure be read and understood before continuing with the system configuration or change. Please read the instructions carefully.

### Updating interrupts and hardware settings

The following interrupt configuration settings are suggested as the most effective means of providing a controller interrupt to the host adapter:

- Host adapter interrupt level must be set to IRQ 10 for proper installation of the ASUS driver.

Please refer to your system documentation to set the interrupt levels and your peripheral documentation for help in setting SCSI IDs.

# 12. SCO UnixWare Driver Installation

## Installing the ASUS driver in a new UnixWare

Drivers for the host adapter may be found on the **PCI-SIU2 DRIVER DISK 2**. In most cases you will load the drivers during a new installation of UnixWare from CD-ROM. The driver is loaded during the early stages of the installation procedure. The UnixWare installation program will prompt you for the required parameters as the installation procedure progresses. It is highly recommended that you have a copy of the SCO UnixWare Installation Handbook and SCO UnixWare System Owner Handbook for reference.

**1**   Insert the "SCO UNIXWARE INSTALLATION DISKETTE" into the floppy drive and turn on the computer. Follow the on-screen installation instructions.

**2**   When prompted to **INSTALL HOST BUS ADAPTER DRIVERS**, insert the **PCI-SIU2 DRIVER DISK 2** into drive A: press **<Enter>**.

**3**   When prompted to **INSTALL ANOTHER HBA DISKETTE**, press **<ENTER>** to continue.

**4**   Follow the directions on screen until you come to a window titled: Loading ASUS PCI-SIU2 Host Adapter.

  • Select **CONTINUE INSTALLATION.**

  • Select **CONTINUE INSTALLATION** again.

**5**   This completes loading the host adapter driver. Follow the on-screen directions to complete the SCO UnixWare installation. For further information regarding UnixWare installation, refer to the SCO UnixWare Installation Handbook.

# 12. SCO UnixWare Driver Installation

## Adding the ASUS driver to an existing UnixWare system

**1** Once a UnixWare session is established and a command prompt is ready, type (recall that UnixWare is case sensitive):

- **cp /stand/unix   /stand/unix.org** , press **<ENTER>**

- **pkgadd -d diskette1** , press **<ENTER>**

**2** Select **a100 ihv hba** from the list of available host drivers, press **<ENTER>**.

**3** If the PCI-SIU2 is intended to be the bootable host adapter, the next step to updating the driver will require a revision to the **a100** file. These instructions will guide you through changing the current software settings for UnixWare to establish the PCI-SIU2 as the host adapter for your boot device:

- At the system command prompt, type
- **cd /etc/conf/sdevice.d**
- Use "vi" or another editor to modify the file **a100** by adding a line
- locate the line **$version2**
- edit the file by adding the line **$static** immediately following $version2.
- Rebuild the UnixWare kernel by completing the following steps at the command prompt :
  - **/etc/conf/bin/idbuild -B <ENTER>**
  - **cp /etc/conf/cf.d/unix    /stand/unix <ENTER>**
  - **cd / <ENTER>**
  - **shutdown -g0**  ( 0 is Zero ) **<ENTER>**
  - **Y  <ENTER>**

**4** If the host adapter is **NOT** intended to be bootable,  these instructions will guide you through changing the current software settings for UnixWare to establish the PCI-SIU2 as a non-bootable host adapter for your device:

- At  the system command prompt, type
  - **/etc/conf/bin/idbuild -Ma100 <ENTER>**
  - **cd / <ENTER>**
  - **shutdown -g0**  ( 0 is Zero ) **<ENTER>**
  - **Y  <ENTER>**

**5** Exit the UnixWare program and reboot your system to initialize the new device driver to control PCI-SIU2.

# Using Multiple Host Adapters

UnixWare is capable of supporting up to eight SCSI busses.  If you choose to use multiple host adapters in your system, verify that each host adapter shared interrupt level is set to IRQ10.  Please refer to your system documentation to set the interrupt levels.

Space for each host adapter in the system is configured and allocated by a separate line in the file **/ETC/CONF/SDEVICE.D/a100**.

**1**     Verify that **Y** is selected in  the second field at the line starting at **a100** in the file **/ETC/CONF/SDEVICE.D/a100** for each PCI-SIU2 in the system.

UnixWare will automatically rebuild the kernel when an additional PCI-SIU2 is detected.

## Removing the ASUS driver from a UnixWare system

**1**     Once a UnixWare session is established and a command prompt is ready, type (recall that UnixWare is case sensitive):

- Type: **/etc/conf/bin/idinstall -d a100 <ENTER>**  to delete the following files:

    /etc/conf/mdevice.d/a100
    /etc/conf/sdevice.d/a100
    /etc/conf/pack.d/a100/driver.o
    /etc/conf/pack.d/a100/space.c
    /etc/conf/pack.d/a100/disk.cfg
    /etc/conf/pack.d/a100/disk.cfg

**2**     Then rebuild the UnixWare kernel by executing the following commands at the system prompt:

**/etc/conf/bin/idbiuld -B -K <ENTER>**
**/cp /etc/conf/cf.d/unix  /stand/unix <ENTER>**
**cd/ <ENTER>**
**shutdown -g0 (where 0 is Zero) <ENTER>**
**Y <ENTER>**

# Troubleshooting

In the following section you will find commonly asked questions and answers to problems encountered during the installation of your host adapter.

**Question:** What is Ultra2?

**Answer:** Ultra2 is a subset of the SCSI-2 specifications. Using LVD technology, which has less susceptibility to noise and has reduced power consumption (due to the LVD designed into the chip technology), the adapter is able to support Ultra2 wide devices with a SCSI burst transfer speed of up to 80MB/sec and a point-to-point (one device) cable length of 25 meters, or 12 meters with two or more devices.

**Question:** On boot-up, not all the peripherals are scanned and recognized.

**Answer:** Verify that each of the SCSI devices on the bus has its own distinct SCSI ID number and all peripherals are receiving power. Refer to your peripheral manual for information regarding changing SCSI ID's.

Verify the SCSI Termination is set correctly. Make sure the last peripheral on the SCSI bus has termination. See the peripheral manual for proper termination information.

After the above steps are executed, if you are still not recognizing all attached peripherals, configure the host adapter to operate in an Asynchronous Transfer mode by changing its setting under the SCSI Devices Setup section of the SmartSCSI Setup Utility. This feature is discussed thoroughly in the chapter entitled Host Adapter Setup.

**Question:** Can the PCI-SIU2 support legacy devices?

**Answer:** This feature will be found on Initio's dual channel Ultra2 SCSI host adapter (INI-A200U2W). In addition to supporting both legacy and Ultra2 devices, the INI-A200U2W will provide support for up to 30 total devices.

**Question:** What is the connector configuration on the adapter?

**Answer:** There are two connectors on the adapter: an internal and external 68-pin connector.

# Troubleshooting

**Question:** Can I use the same cables for Ultra2 devices as I use for Ultra peripherals?

**Answer:** It is recommended that you use cables specifically designed for Ultra2 devices. The PCI-SIU2 kit contains a terminated Ultra2 Wide cable with connectors for four Ultra2 peripherals.

**Question:** What are the computer requirements for the PCI-SIU2?

**Answer:** The adapter requires a PCI 2.1 compatible PCI bus connection with Bus Mastering capabilities.

**Question:** Under SCO UnixWare, the system displays a panic message or crashes during bootup:

**Answer:** Reboot the system and verify that the PCI-SIU2 is using IRQ10. Please Refer to your system documentation to set the interrupt levels and your peripheral documentation for help in setting SCSI ID's.

In order to boot from the old UnixWare kernel, reboot the system and execute the following steps:

• Begin an interactive boot session by pressing the **<SPACEBAR>** at the BOOTING UNIXWARE prompt.

• At the system **[boot]#** prompt, type **KERNEL=unix.org <ENTER>**

• Type **go <ENTER>**

Consult the *SCO UnixWare Installation Handbook* "Troubleshooting" section to help isolate the problem. If it becomes necessary to remove the ASUS device driver, please consult the "Removing the ASUS Driver from a SCO UnixWare System" section of this document.

**Question:** I don't have any LVD Ultra2 devices yet. Can I still install my SCSI-2 devices on the PCI-SIU2 until I get some?

**Answer:** Yes. In fact, by connecting your standard UltraWide devices to the card you obtain the equivalent of UltraWide performance at a 3 meter length limit and speeds to 40MB/sec.

**Question:** What cables are included with the kit?

**Answer:** The kit contains a 5 connector Ultra2 68-pin terminated cable.

# Troubleshooting

**Question:** How do I set the burst transfer rate for SCSI devices?

**Answer:** The maximum synchronous transfer rate is set in the SmartSCSI Utility Interface. By pressing <Ctrl><I> at system bootup, you can go into the SmartSCSI Ulility, click on *Device Setup* and follow the onscreen options to select the desired transfer rate.

**Question:** Is it necessary that the last SCSI device on the cable is terminated?

**Answer:** Yes. Improper termination on the host adapter or SCSI bus segment may cause the card not to initialize and the driver may fail to load.

**Question:** On boot-up the message "SCSI BIOS Installed" is displayed, but my system hangs.

**Answer:** Verify that the CMOS interrupt structure is set to INTA and the CMOS IRQ level matches the jumper settings on the motherboard. Refer to your PC user manual.

**Question:** On boot-up I get a message "Missing Operating System", displayed. The boot drive is greater than 1 gigabyte.

**Answer:** Verify the "DOS SPACE> 1 GB" is enabled in the PCI-SIU2 SmartSCSI Setup Utility.

# B: DOS Space > 1GB

The default disk head mapping for ASUS SCSI host adapter is 255 heads and 63 sectors. This translates to a maximum accessible capacity of 8 GBytes per drive under MS-DOS.

**WARNING:** **If you have already installed the operating system on your hard drives, changing the head mapping will corrupt your files and cause other unexpected problems. Before changing any "DOS Space > 1GB" option setting, please back up your disk drives. Then you should run the FDISK utility to delete all the partitions on your selected disk drive. At this point you can switch the setting, reinstall the operating system, and restore your backed up files.**

All device drivers for the PCI-SIU2 will support different head mappings based on the setting of "DOS Space > 1GB" option.

## MS-DOS, OS/2 & Windows NT

Under MS-DOS, OS/2 & Windows NT, we recommend you enable "DOS Space > 1GB" option if your SCSI hard disk has more than 1 GByte capacity

## SCO UNIX

SCO UNIX does not have a 1 GByte barrier. Therefore, the "DOS Space > 1GB" option is not required to be enabled; however, you must make sure the root file system is located below 1024 cylinders in order to perform the kernel boot routines. If the size of the root file system is greater than 1 GByte or the location of root file system is beyond 1 GByte, you should enable the "DOS Space > 1GB" option.

SCO UNIX can not support different head mappings for each disk drive under the same host adapter. The head mapping will be based on the setting represented by target ID 0.

## Drives with Multiple Operating Systems

It is mandatory that the same head mapping be used across multiple operating systems on one drive. However you can use different head mappings on different drives with the exception of SCO UNIX. It is recommended that you enable "DOS Space > 1GB" option if the capacity of your SCSI hard disk has more than 1 GByte.