Serial Attached SCSI Host
Bus Adapters Installation
and User's Guide

CDP-00279-01-A Rev. A
Issue: March 21, 2013
### Revision History

<table>
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<tr>
<th>Issue</th>
<th>Issue Date</th>
<th>Details of Change</th>
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<tr>
<td>1.00</td>
<td>March 21, 2013</td>
<td>Adaptec SAS Host Bus Adapter Series 7H/7He, Adaptec SAS Host Bus Adapter Series 6H</td>
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Adaptec by PMC Product Support

If you have questions about installing or using your Adaptec by PMC product, check this document first—you will find answers to most of your questions. If you need further assistance, use the support options listed below. To expedite your service, have your computer in front of you.

**Note:** The phone numbers below are subject to change. Please visit the Support section of www.adaptec.com for the most up to date contact information.

**Technical Support Identification (TSID) Number**

- Before contacting Technical Support, you need your product unique TSID number. The TSID number identifies your product and support status.
- The TSID number is included on a white, bar-coded label, like this example:

  ![Example TSID Label]

- It's recommended that you register your product so that you have easy access to your TSID when contacting product support.

**Self Help and Support in English**

- Search the Adaptec Support Knowledgebase (ASK) at ask.adaptec.com for articles, troubleshooting tips, and frequently asked questions for your product.
- For support via e-mail, submit your question at ask.adaptec.com.
- To speak with a Technical Support Specialist, call +1 408 934 7274 or +49 89 4366 5544 or +44 845 266 8773.

**Technische Informationen und Support in Deutsch**

- Besuchen Sie unsere Webseite www.adaptec.com/de-de
- Suchen Sie in der Adaptec Support Knowledgebase (ASK) unter ask-de.adaptec.com nach Artikeln, Tipps zur Fehlerbehebung und häufig gestellten Fragen zu Ihrem Produkt.
- Support per Email erhalten Sie unter ask-de.adaptec.com.
- Für telefonischen Support wählen Sie +49 89 4366 5522.

**Техническая поддержка и информация на русском языке**

- База знаний Adaptec (ASK) на сайте ask-ru.adaptec.com ask-ru.adaptec.com — статьи, советы по устранению неисправностей и часто задаваемые вопросы о Вашем продукте.
- Для поддержки по электронной почте отправьте Ваш запрос на сайте ask-ru.adaptec.com.
- Чтобы обратиться к специалисту технической поддержки по телефону, звоните на +7 499 918 7200 или +49 89 4366 5555.

**日本語での技術情報とサポート**

- 弊社のウェブサイト、www.adaptec.com/ja-jp をご覧ください。
- ask.adaptec.co.jp のAdaptec Support Knowledgebase (ASK)で、お使いの製品の情報 トラブルシューティングのヒント、よくある質問を検索してください。
- Eメールでのサポートには ask.adaptec.co.jp から質問を送ってください。
Information Technique et d'assistance en Français

- Visitez notre site Web à l'adresse www.adaptec.com/fr-fr.
- Rechercher dans le base de connaissances Adaptec (ASK) ask-fr.adaptec.com pour des articles, conseils de dépannage et les questions fréquemment posées pour votre produit.
Limited 3-Year Hardware Warranty

1. PMC-Sierra, Inc. ("PMC-Sierra") warrants to the purchaser of this product that it will be free from defects in material and workmanship for a period of three (3) years from the date of purchase. If the product should become defective within the warranty period, PMC-Sierra, at its option, will repair or replace the product, or refund the purchaser’s purchase price for the product, provided it is delivered at the purchaser’s expense to an authorized PMC-Sierra service facility or to PMC-Sierra.

2. Repair or replacement parts or products will be furnished on an exchange basis and will either be new or reconditioned and will be subject to original warranty term. All replaced parts or products shall become the property of PMC-Sierra. This warranty shall not apply if the product has been damaged by accident, misuse, abuse or as a result of unauthorized service or parts.

3. Warranty service is available to the purchaser by delivering the product during the warranty period to an authorized PMC-Sierra service facility or to PMC-Sierra and providing proof of purchase price and date. The purchaser shall bear all shipping, packing, and insurance costs and all other costs, excluding labor and parts, necessary to effectuate repair, replacement or refund under this warranty.

4. For more information on how to obtain warranty service, write or telephone:
   • Americas PMC-Sierra, Inc. at 1380 Bordeaux Drive Sunnyvale, CA 94089 USA, +1 408 934-7274
   • EMEA PMC-Sierra, at Lise-Meitner-Strasse 7, 85737 Ismaning, Germany, +49 89 43665544
   • Asia Pacific PMC-Sierra, at PO Box 110, Peakhurst NSW 2210, Australia, +61 2 8212-5531
   • Japan PMC-Sierra, at Tokumasu-Building 4F, 5-5-5, Higashinakano, Nakano-ku, Tokyo 164-0003, Japan, 03-3367-3970 (fax).

5. THIS LIMITED WARRANTY DOES NOT EXTEND TO ANY PRODUCT WHICH HAS BEEN DAMAGED AS A RESULT OF ACCIDENT, MISUSE, ABUSE, OR AS A RESULT OF UNAUTHORIZED SERVICE OR PARTS.

6. THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES WHICH NOW OR HEREAFTER MIGHT OTHERWISE ARISE RESPECT TO THIS PRODUCT. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT SHALL (A) HAVE NO GREATER DURATION THAN 3 YEARS FROM THE DATE OF PURCHASE, (B) TERMINATE AUTOMATICALLY AT THE EXPIRATION OF SUCH PERIOD AND (C) TO THE EXTENT PERMITTED BY LAW BE EXCLUDED. IN THE EVENT THIS PRODUCT BECOMES DEFECTIVE DURING THE WARRANTY PERIOD, THE PURCHASER’S EXCLUSIVE REMEDY SHALL BE REPAIR, REPLACEMENT OR REFUND AS PROVIDED ABOVE. INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION LOSS OF DATA, ARISING FROM BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ARE NOT THE RESPONSIBILITY OF PMC-SIERRA AND, TO THE EXTENT PERMITTED BY LAW, ARE HEREBY EXCLUDED BOTH FOR PROPERTY DAMAGE, AND TO THE EXTENT NOT UNCONSCIONABLE, FOR PERSONAL INJURY DAMAGE.

7. WITHIN THE US, SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS, AND SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSIONS MAY NOT APPLY TO YOU.

8. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY DEPENDING ON WHERE YOU RESIDE.

9. FOR AUSTRALIA RESIDENTS, IF THE PRODUCT SHOULD BECOME DEFECTIVE WITHIN THE WARRANTY PERIOD, PMC-SIERRA, AT ITS OPTION, WILL REPAIR OR REPLACE THE PRODUCT, OR REFUND THE PURCHASER’S PURCHASE FOR THE PRODUCT, PROVIDED IT IS DELIVERED AT THE PURCHASER’S EXPENSE BACK TO THE PLACE OF PURCHASE AFTER PMC-SIERRA TECHNICAL SUPPORT HAS ISSUED AN INCIDENT NUMBER. IN ADDITION TO THE WARRANTIES SET FORTH HEREIN, OUR GOODS COME WITH GUARANTEES THAT CANNOT BE EXCLUDED UNDER THE AUSTRALIAN CONSUMER LAW. YOU ARE ENTITLED TO A REPLACEMENT OR REFUND FOR A MAJOR FAILURE AND FOR COMPENSATION FOR ANY OTHER REASONABLY FORESEEABLE LOSS OR DAMAGE. YOU ARE ALSO ENTITLED TO HAVE THE GOODS REPAIRED OR REPLACED IF THE GOODS FAIL TO BE OF ACCEPTABLE QUALITY AND THE FAILURE DOES NOT AMOUNT TO A MAJOR FAILURE.
Regulatory Compliance Statements

Federal Communications Commission Radio Frequency Interference Statement

Attention: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

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 the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment 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:

- Reorient or relocate the receiving antenna.
- Increase the separation between 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/television technician for help.
- Use a shielded and properly grounded I/O cable and power cable to ensure compliance of this unit to the specified limits of the rules.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

UL Compliance Statement

Adaptec by PMC products are tested and listed by Underwriters Laboratories, Inc. to UL 60950-1 Second Edition and IEC-60950-1 Second Edition standards, file numbers E175975. Adaptec by PMC products are for use only with UL listed ITE.

Use only with the listed ITE:

PMC-Sierra, Inc.

ASA-70165H/ASA-70165He/ASA-71605H/
ASA-71605He/ASA-7085H/
ASA-7805H/
ASA-6805H/ASA-6405H
European Union Compliance Statement

This Information Technology Equipment has been tested and found to comply with EMC Directive 89/336/EEC, as amended by 92/31/EEC and 93/68/EEC, in accordance with:

  - Class B ITE radiated and conducted emissions
  - EN61000-4-2 (2009) Electrostatic discharge: ±4 kV contact, ±8 kV air
  - EN61000-4-3 (2010) Radiated immunity: 3V/m
  - EN61000-4-4 (2004) Electrical fast transients/burst: ±1 kV AC, ±0.5 kV I/O
  - EN61000-4-5 (2006) Surges: ±1 kV differential mode, ±2 kV common mode
  - EN61000-4-6 (2009) Conducted immunity: 3 V
  - EN61000-4-11 (2004) Supply dips and variations: 30% and 100%
- EN50581 (2012) Technical Documentation:
  - For the assessment of electrical and electronic products with respect to the restriction of hazardous substances

In addition, all equipment requiring U.L. listing has been found to comply with EMC Directive 73/23/EEC as amended by 93/68/EEC in accordance with EN60950 with amendments A1, A2, A3, A4, A11.

Australian/New Zealand Compliance Statement

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to the Australian/New Zealand standard AS/NZS 3548 set out by the Spectrum Management Agency.

Canadian Compliance Statement

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Japanese Compliance (Voluntary Control Council Initiative)

This equipment complies to class B Information Technology equipment based on VCCI (Voluntary Control Council for Interface). This equipment is designed for home use but it may causes radio frequency interference problem if used too near to a television or radio. Please handle it correctly per this documentation.

Korean Compliance (KCC) Statement

Adaptec by PMC products are tested and certified by KCC:

KCC-REM-KHK-ASA-6xx5
KCC-REM-KHK-ASA-7xxx5

The above certification covers the following series:

ASA-70165H, ASA-70165He, ASA-71605H
ASA-71605H, ASA-7085H
ASA-7805H, ASA-6805H
ASA-6405H
This equipment is home use (Class B) electromagnetic wave suitability equipment and to be used mainly at home and it can be used in all areas.

B급 기기
(가정용 방송통신기자재)
Class B Equipment
(For Home Use Broadcasting & Communication Equipment)
이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

Proprietary and Confidential to PMC-Sierra, Inc.
Document No.: CDP-00279-01-A Rev. A, Issue:
1 About This Guide
This Installation and User’s Guide explains how to install and configure your Adaptec® by PMC™ Host Bus Adapter (HBA).
These Adaptec SAS Adapter (ASA) models are described in this guide:
- ASA-70165H, ASA-70165He
- ASA-71605H, ASA-71605He
- ASA-7085H
- ASA-7805H
- ASA-6405H
- ASA-6805H

What You Need to Know Before You Begin
You should be familiar with computer hardware, data storage, and Serial Attached SCSI (SAS) and Serial ATA (SATA) technology.
You should also be familiar with direct-attached storage (DAS) concepts and technology.

Note: Because this guide covers multiple Adaptec HBA products, some of the features and functions described may not be available for your HBA model. For more information, see About Your Host Bus Adapter on page 14.

Terminology Used in this Guide
Many of the terms and concepts referred to in this guide are known to computer users by multiple names. This guide uses these terms:
- Host Bus Adapter or HBA (also known as adapter, board, or I/O card)
- Disk drive (also known as hard disk, hard drive, or hard disk drive)
- Solid State Drive (also known as SSD or non-rotating storage media)
- Enclosure (also known as storage enclosure, JBOD enclosure, or expander)

How to Find More Information
You can find more information about your Adaptec Host Bus Adapter and the software and utilities included with it by referring to these documents:
- Adaptec Serial Attached SCSI Host Bus Adapters Installation and User’s Guide (this guide)—Describes how to set up and install your Adaptec Host Bus Adapter and use the included management tools and software; located on the Adaptec Installation DVD.
- Readme.txt—Includes updated product information and known issues; located on the Adaptec Installation DVD.
Kit Contents and System Requirements

This section lists the contents of your Adaptec Host Bus Adapter kit and the system requirements for successfully installing and using your HBA.

**Kit Contents**

- Adaptec Host Bus Adapter
- (Adaptec Series 7He only) Encryption key (pre-installed)
- Low-profile bracket
- Adaptec Serial Attached SCSI Host Bus Adapters Installation and User's Guide (on the installation DVD)

**System Requirements**

- PC-compatible computer with Intel Pentium, or equivalent, processor
- Motherboard with these features:
  - Support for multi-function devices where one of the devices is a PCI bridge
  - Large memory-mapped address ranges
- Refer to the Readme file on the Adaptec Installation DVD for additional motherboard compatibility information.
- One of these operating systems:
  - Microsoft® Windows® Server 2012 (64-bit), Windows Server 2008 R2 (64-bit), Windows SBS 2011, Windows 7 (32-bit and 64-bit), Windows 8 (32-bit and 64-bit)
  - Red Hat® Enterprise Linux 6.3 (32-bit and 64-bit)
  - VMware ESXi 5.0
- 2 GB (or more) of RAM
- Available compatible PCIe slot (depending on your adapter model—see the descriptions in About Your Host Bus Adapter on page 14)
- 120 MB of free disk drive space
- 16-bit SVGA color monitor with a resolution of at least 800 x 600
- DVD-ROM drive
- USB flash drive or CD burner for creating driver disks and bootable media
3 About Your Host Bus Adapter

This section provides an overview of the features of your Adaptec Host Bus Adapter.

Standard Host Bus Adapter Features

- Support for SAS and SATA HDDs, Solid State Drives (SSDs), removable media, and SAS tape drives
- uEFI pre-boot BIOS, Ctrl-A configuration utility
- Flash ROM for updates to firmware and BIOS
- up to 16 ports, 6 Gb/s I/O
- SAS 2.1, PCIe Gen 3.0 (Series 7H/7He), PCIe Gen 2.0 (Series 6H)
- Low-profile MD2 SFF card size
- Support for disk drive enclosures with SES2 enclosure management hardware
- Hot plug support for both direct-attached drives and expanders
- Universal asynchronous receiver/transmitter (UART) debug/diagnostic port
About the Adaptec SAS Adapter 70165H/70165He

The Adaptec SAS Adapter 70165H/70165He is a SAS Host Bus Adapter with these features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>Low-profile MD2 SFF card size</td>
</tr>
<tr>
<td>Bus compatibility</td>
<td>PCIe Gen3</td>
</tr>
<tr>
<td>PCIe bus width</td>
<td>x8</td>
</tr>
<tr>
<td>Data transfer rate</td>
<td>6 Gb/s per port</td>
</tr>
<tr>
<td>Phys (Unified Serial Ports)</td>
<td>16</td>
</tr>
<tr>
<td>Connectors, external</td>
<td>4 mini-SAS HD x4 (SFF-8644)</td>
</tr>
<tr>
<td>Maximum number of disk drives</td>
<td>16 direct-attached (or up to 128 with expanders)</td>
</tr>
<tr>
<td>Enclosure Support</td>
<td>SES2</td>
</tr>
<tr>
<td>Thermal Sensor</td>
<td>Processor temperature</td>
</tr>
<tr>
<td>Encryption</td>
<td>70165H: No</td>
</tr>
<tr>
<td></td>
<td>70165He: Yes, with Encryption Key</td>
</tr>
</tbody>
</table>
About the Adaptec SAS Adapter 71605H/71605He

The Adaptec SAS Adapter 71605H/71605He is a SAS Host Bus Adapter with these features:

- 4 internal mini-SAS HD connectors
- Drive Activity LED connector
- Encryption key connector (He model only)
- HDA Mode (flash) connector
- PCIe x8 connector
- Mounting bracket
- Encryption
  - 71605H: No
  - 71605He: Yes, with Encryption Key

<table>
<thead>
<tr>
<th>Specification</th>
<th>71605H</th>
<th>71605He</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>Low-profile MD2 SFF card size</td>
<td></td>
</tr>
<tr>
<td>Bus compatibility</td>
<td>PCIe Gen3</td>
<td></td>
</tr>
<tr>
<td>PCIe bus width</td>
<td>x8</td>
<td></td>
</tr>
<tr>
<td>Data transfer rate</td>
<td>6 Gb/s per port</td>
<td></td>
</tr>
<tr>
<td>Phys (Unified Serial Ports)</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Connectors, internal</td>
<td>4 mini-SAS HD x4 (SFF-8643)</td>
<td>4 mini-SAS HD x4 (SFF-8643)</td>
</tr>
<tr>
<td>Maximum number of disk drives</td>
<td>16 direct-attached (or up to 128 with expanders)</td>
<td>16 direct-attached (or up to 128 with expanders)</td>
</tr>
<tr>
<td>Enclosure Support</td>
<td>SES2 and SGPIO (Serial General Purpose Input/Output)</td>
<td>SES2 and SGPIO (Serial General Purpose Input/Output)</td>
</tr>
<tr>
<td>Thermal Sensor</td>
<td>Processor temperature</td>
<td></td>
</tr>
<tr>
<td>Encryption</td>
<td>71605H: No</td>
<td>71605He: Yes, with Encryption Key</td>
</tr>
</tbody>
</table>
About the Adaptec SAS Adapter 7085H

The Adaptec SAS Adapter 7085H is a SAS Host Bus Adapter with these features:

- 2 external mini-SAS HD connectors
- Drive Activity LED connector
- PCIe x8 connector
- HDA Mode (flash) connector
- Form Factor: Low-profile MD2 SFF card size
- Bus compatibility: PCIe Gen3
- PCIe bus width: x8
- Data transfer rate: 6 Gb/s per port
- Phys (Unified Serial Ports): 8
- Connectors, external: 2 mini-SAS HD x4 (SFF-8644)
- Maximum number of disk drives: 8 direct-attached (or up to 128 with expanders)
- Enclosure Support: SES2
- Thermal Sensor: Processor temperature
- Encryption: No
About the Adaptec SAS Adapter 7805H

The Adaptec SAS Adapter 7805H is a SAS Host Bus Adapter with these features:

- 2 internal mini-SAS HD connectors
- CN0
- CN1
- Drive Activity LED connector
- PCIe x8 connector
- HDA Mode (flash) connector
- Low-profile MD2 SFF card size
- PCIe Gen3
- x8 PCIe bus width
- 6 Gb/s per port data transfer rate
- 16 Phys (Unified Serial Ports)
- 4 mini-SAS HD x4 (SFF-8643) connectors, internal
- 16 direct-attached (or up to 128 with expanders) maximum number of disk drives
- SES2 and SGPIO (Serial General Purpose Input/Output)
- Processor temperature
- No encryption

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</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>Low-profile MD2 SFF card size</td>
</tr>
<tr>
<td>Bus compatibility</td>
<td>PCIe Gen3</td>
</tr>
<tr>
<td>PCIe bus width</td>
<td>x8</td>
</tr>
<tr>
<td>Data transfer rate</td>
<td>6 Gb/s per port</td>
</tr>
<tr>
<td>Phys (Unified Serial Ports)</td>
<td>16</td>
</tr>
<tr>
<td>Connectors, internal</td>
<td>4 mini-SAS HD x4 (SFF-8643)</td>
</tr>
<tr>
<td>Maximum number of disk drives</td>
<td>16 direct-attached (or up to 128 with expanders)</td>
</tr>
<tr>
<td>Enclosure Support</td>
<td>SES2 and SGPIO (Serial General Purpose Input/Output)</td>
</tr>
<tr>
<td>Thermal Sensor</td>
<td>Processor temperature</td>
</tr>
<tr>
<td>Encryption</td>
<td>No</td>
</tr>
</tbody>
</table>
About the Adaptec SAS Adapter 6405H

The Adaptec SAS Adapter 6405H is a SAS Host Bus Adapter with these features:

- 1 internal mini-SAS connector
- CN0 PCIe x4 connector
- Low-profile MD2 SFF card size
- PCIe Gen2 bus compatibility
- x4 PCIe bus width
- 6 Gb/s per port data transfer rate
- 4 Phys (Unified Serial Ports)
- 1 mini-SAS x4 (SFF-8087) connectors, internal
- 4 direct-attached (or up to 128 with expanders) maximum number of disk drives
- SES2 and SGPIO (Serial General Purpose Input/Output) enclosure support
- No thermal sensor
- No encryption

<table>
<thead>
<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>Form Factor</td>
<td>Low-profile MD2 SFF card size</td>
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<tr>
<td>Bus compatibility</td>
<td>PCIe Gen2</td>
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<tr>
<td>PCIe bus width</td>
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<tr>
<td>Data transfer rate</td>
<td>6 Gb/s per port</td>
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<tr>
<td>Phys (Unified Serial Ports)</td>
<td>4</td>
</tr>
<tr>
<td>Connectors, internal</td>
<td>1 mini-SAS x4 (SFF-8087)</td>
</tr>
<tr>
<td>Maximum number of disk drives</td>
<td>4 direct-attached (or up to 128 with expanders)</td>
</tr>
<tr>
<td>Enclosure Support</td>
<td>SES2 and SGPIO (Serial General Purpose Input/Output)</td>
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</tr>
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</table>
About the Adaptec SAS Adapter 6805H

The Adaptec SAS Adapter 6805H is a SAS Host Bus Adapter with these features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>Low-profile MD2 SFF card size</td>
</tr>
<tr>
<td>Bus compatibility</td>
<td>PCIe Gen2</td>
</tr>
<tr>
<td>PCIe bus width</td>
<td>x4</td>
</tr>
<tr>
<td>Data transfer rate</td>
<td>6 Gb/s per port</td>
</tr>
<tr>
<td>Phys (Unified Serial Ports)</td>
<td>8</td>
</tr>
<tr>
<td>Connectors, internal</td>
<td>2 mini-SAS x4 (SFF-8087)</td>
</tr>
<tr>
<td>Maximum number of disk drives</td>
<td>8 direct-attached (or up to 128 with expanders)</td>
</tr>
<tr>
<td>Enclosure Support</td>
<td>SES2 and SGPIO (Serial General Purpose Input/Output)</td>
</tr>
<tr>
<td>Thermal Sensor</td>
<td>No</td>
</tr>
<tr>
<td>Encryption</td>
<td>No</td>
</tr>
</tbody>
</table>
4 Installing the Adapter and Disk Drives
This section explains how to install your Adaptec Host Bus Adapter and connect it to internal and external disk drives.

Before You Begin

- Read Safety Information on page 39.
- Familiarize yourself with your HBA’s physical features (see Standard Host Bus Adapter Features on page 14).
- If you are installing the HBA into a low-profile computer cabinet, replace the original full-height bracket with the low-profile bracket included in the kit (see Replacing the Full-Height Bracket with a Low-Profile Bracket on page 21).
- If your HBA supports encryption, verify that the encryption key is installed on the adapter card and seated securely (see Checking the Encryption Key on page 23).
- Ensure that you have the right number of drives and cables for your application (see Selecting Disk Drives and Cables on page 23).

Replacing the Full-Height Bracket with a Low-Profile Bracket

If you are installing your Adaptec HBA into a low-profile computer cabinet, replace the original full-height bracket with the low-profile bracket included in your distribution kit. The full-height bracket is mounted on the front of the adapter board, the low-profile bracket is mounted on the back, as shown in the figures below.

To replace the full-height bracket with the low-profile bracket:

1. Remove the full-height bracket from the adapter board. The full-height bracket is installed on the front side of the adapter, with the mounting screws inserted from the back (see Figure 1). Using a Phillips head screw driver, remove the mounting screws, as shown in Figure 2, then set the screws aside for use in the next step.
2. Attach the low-profile bracket to the adapter board. The low-profile bracket is installed on the back side of the adapter, with the mounting screws inserted from the front, as shown the Figure 3. Insert the screws through the holes on the front of the adapter, then fasten the screws to the bracket with a Phillips screw driver.

   **Caution:** The mount points on the low-profile bracket have a smooth or flat side and a raised side that looks like a spacer (see Figure 3). Be sure to install the bracket with the flat side against the adapter board and the raised side facing away from the adapter board.

   **Caution:** The torque on the mounting screws should be a maximum of 3.0-4.0 lbf-in to avoid deformation. Be sure that the adapter is not bent after attaching the low-profile bracket to the adapter board.
Checking the Encryption Key

If your host bus adapter supports encryption (*Adaptec Series 7He only*), the encryption key is pre-installed on the adapter board. The location of the encryption key depends on the adapter model. Refer to the figures below for the location of the encryption key on your adapter board, then verify that the key is installed and seated securely.

![Encryption key location on Adaptec 70165He](image1)

![Encryption key location on Adaptec 71605He](image2)

Selecting Disk Drives and Cables

**Disk Drives**


**Cables**


**Note:** We recommend using Adaptec SAS cables only.

**Adaptec Series 7H/7He Cables**

- Internal mini-SAS HD to mini-SAS (SFF-8643 to SFF-8087)—Connects to a backplane or enclosure.

- External mini-SAS HD to mini-SAS (SFF-8644 to SFF-8088)—Connects to a backplane or enclosure.
Adaptec Series 6H Cables

- Internal mini-SAS with power (SFF-8087 to SFF-8482)—Connects to four SAS or SATA disk drives.
- Internal mini-SAS to SATA fan-out (SFF-8087 to 4x SATA)—Connects to four SATA disk drives.
- Internal mini-SAS to mini-SAS (SFF-8087 to SFF-8087)—Connects to a backplane or enclosure.
Installing the Host Bus Adapter

This section describes how to install the Adaptec Host Bus Adapter into your computer cabinet or server. Adaptec Host Bus Adapters come in two configurations:

- Adapters with internal connectivity
- Adapters with external connectivity

Follow the steps below to install your HBA and connect your internal or external storage devices.

**Caution:** Be sure to handle the adapter by its bracket or edges only.

1. Turn off your computer and disconnect the power cord and any network cables. Open the cabinet, following the manufacturer’s instructions.

2. Select an available PCIe expansion slot that’s compatible with your HBA and remove the slot cover, as shown in the figure below. (To check PCIe bus compatibility of your HBA, see *About Your Host Bus Adapter* on page 14.)

   **Caution:** Touch a grounded metal object before handling the adapter.

3. Insert the HBA into the expansion slot and press down gently but firmly until it clicks into place. When installed properly, the adapter should appear level with the expansion slot.

4. Secure the bracket in the expansion slot, using the retention device (for instance, a screw or lever) supplied with your computer.
5. *(Optional)* Connect your computer's disk activity LED cable to the LED connector on the HBA (marked on the figures in *About Your Host Bus Adapter* on page 14). Ensure that the positive lead of the LED cable (usually a red wire or a wire marked with a red stripe) is attached to pin 1.

6. Connect serial cables between the HBA and internal or external disk drives, as required:
   - For an HBA with external ports, connect serial cables between the HBA and external disk drives or enclosures:
     
     ![External Ports, Front view]

   - For an HBA with internal ports, connect serial cables between the HBA and internal disk drives:
     
     ![Internal Ports, Front view]

7. Close your computer cabinet, reconnect the power cord and network cables, then power up the system.
5 Installing the Driver and an Operating System

This chapter explains how to install your Adaptec HBA driver while installing the operating system.

Note: After you install the driver and OS, use the system BIOS to set the HBA as the boot device. For more information, see the readme on the installation DVD.

Note: To install the driver on an existing operating system, see Installing the Driver on an Existing Operating System on page 31.

Before You Begin

- Install your Adaptec Host Bus Adapter and connect internal or external disk drives (see Installing the Adapter and Disk Drives on page 21).
- Create a driver disk (see the following section).
  Note: For up-to-date operating system version support or to download the latest drivers, visit the Adaptec Web Site at www.adaptec.com. From the main menu select Support>Knowledgebase>Advanced Search>Limit by Category>OS type or Limit by Category>Downloads, enter your adapter model, then click Search.

Creating a Driver Disk

This section describes how to create a driver disk for the supported operating systems. You will need a USB flash drive or writable CD to complete this task.

- For Windows and Red Hat Linux, create the driver disk using the Create Diskette menu on the Adaptec Installation DVD.
- For VMware, create a custom boot image using the VMware Image Builder tool. See Installing with VMware ESXi 5.0 on page 28.

To create a driver disk using the Create Diskette menu:

1. Set your system BIOS so that your computer boots from the DVD drive.
2. Turn on your computer, then insert the Adaptec Installation DVD.
3. Click Create Diskette, then select your operating system and version.
4. When prompted, insert a USB flash drive, then click OK.
   The system creates the driver disk on the USB drive.
5. Remove and label the driver disk.

Installing with Windows

   Note: Use the following procedure for all supported Windows versions (for a complete list, see System Requirements on page 13). You will need your Windows Installation CD to complete this task.

To install the Adaptec HBA driver while installing Windows:

1. Insert your Windows CD, then restart the computer.
2. Follow the on-screen instructions to begin the Windows installation.
3. When prompted to specify a location for Windows, select Load Driver.
4. Insert the USB driver disk, browse to the driver location, then click OK.
5. When the Adaptec driver is found, press Next.
   If you see the message 'No drives were found', repeat Step 3, Step 4 (browse to driver location), and Step 5. On the second attempt, the driver will load successfully.
6. Click Next again to accept the default partition configuration, or refer to your Windows documentation to configure partitions manually.
7. Follow the on-screen instructions to complete the installation.
Installing with Red Hat Linux

**Note:** You will need your Red Hat installation CD to complete this task. You must have root privileges to install the driver image.

To install the Adaptec HBA driver while installing Red Hat Linux:

1. Insert the Red Hat installation CD, then restart your computer.
2. When the installation menu appears, press Tab, then insert the USB driver disk.
3. Press e to edit the "vmlinuz" line, add a Space, then type the following command and press Enter:
   ```
   linux dd
   ```
4. Press b to boot.
5. Select Yes to indicate that you have a driver disk, then select the driver image from the USB drive (typically, /dev/sda1).
6. Complete the installation, following the on-screen instructions, then reboot.

Installing with VMware ESXi 5.0

**Note:** You will need a writable CD to complete this task. You must have administrator privileges to create the driver disk and install the driver image.

To install the Adaptec HBA driver with VMware ESXi 5.0, you must create a custom boot image using the VMware Image Builder tool. The VMware Image Builder is distributed as a snap-in component for vSphere PowerCLI, a command-line and scripting tool from VMware based on Microsoft PowerShell.

You can download PowerCLI from the VMware Download Center at [www.vmware.com/downloads](http://www.vmware.com/downloads). To perform the installation, you will also need to download the VMware ESXi5.x Standard Software Depot from the VMware Download Center.

**Note:** In the following instructions, perform Steps 1-7 on the Windows machine used to build the custom boot image, and Steps 8-11 on the machine where you want to install the custom image. Be sure to install the prerequisite software first, including Powershell and Microsoft .NET 2.0, before you install PowerCLI or create the custom boot image.

To install the Adaptec HBA driver while installing VMware ESXi 5.0:

1. Download Microsoft PowerShell and Microsoft .NET 2.0 (if not installed on your machine already) and install on your Windows build machine. You can download PowerShell and Microsoft .NET from the Microsoft Download Center at [www.microsoft.com/download](http://www.microsoft.com/download).

   **Note:** PowerShell is preinstalled on many Windows systems, including Windows Server 2012, Windows 7, and Windows 8.

2. Download and install vSphere PowerCLI on your Windows build machine. You can download PowerCLI from the VMware Download Center at [www.vmware.com/downloads](http://www.vmware.com/downloads) (for example, VMware-PowerCLI-5.0.0-374833.exe).

3. Run PowerShell as Administrator, then set the execution policy to Remote Signed:
   ```
   # Set-ExecutionPolicy RemoteSigned
   ```

4. Download the VMware ESXi5.0 Standard Software Depot (for example, vmware-ESXi-5.0.0-469512-depot.zip) and store in a temporary location on your Windows build machine. You can download the software depot from the VMware Download Center at [www.vmware.com/downloads](http://www.vmware.com/downloads). When you start the download, be sure to choose "ESXi Offline Bundle".

   **Note:** You may need to provide account credentials to download the software depot from the VMware Web site.

5. Insert the Adaptec Installation DVD, navigate to the esx5.0/bundle folder, then copy the driver binary to a temporary location on your Windows machine:
<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESXi 5.0</td>
<td>adp80xx.zip</td>
</tr>
</tbody>
</table>

After you copy the file, remove the Adaptec Installation DVD.

6. Launch vSphere PowerCLI, then follow the steps below to create the custom boot image:
   a) At the PowerCLI prompt, add the VMware Image Builder snap-in by running the following cmdlet:

   ```powershell
   # Add-PSSnapIn VMware.ImageBuilder
   Note: You will see a message if the Image Builder snap-in is already installed.
   You can ignore this message.
   Note: Continue using PowerCLI in Steps 6.b through 6.j.
   ```

   b) Add the VMware ESXi 5.0 Software Depots:

   ```powershell
   # Add-EsxSoftwareDepot
   C:\ESXi5.0-PMC-CustomISO\vmware-ESXi-5.0.0-469512-depot.zip
   ```

   where C:\ESXi5.0-PMC-CustomISO is the temporary folder on your Windows machine where the software depot is stored.

c) Add the driver binary as a software depot:

   ```powershell
   # Add-EsxSoftwareDepot C:\ESXi5.0-PMC-CustomISO\adp80xx.zip
   ```

   where C:\ESXi5.0-PMC-CustomISO is the temporary folder on your Windows machine where the software depot is stored.

d) Verify that the software depots are added:

   ```powershell
   # $DefaultSoftwareDepots
   ```

e) List ESX Image Profiles:

   ```powershell
   # Get-EsxImageProfile
   You should see a display similar to this:
   ESXi-5.0.0-469512-no-tools
   ESXi-5.0.0-469512-standard
   ```

f) Create a copy of the standard image profile, using the -CloneProfile option:

   ```powershell
   # New-EsxImageProfile -CloneProfile ESXi-5.0.0-469512-standard -Name "ESXi 5.0 Adaptec Series 7H"
   ```

g) At the Vendor prompt, type PMC-SIERRA and press Enter:

   ```powershell
   Vendor: PMC-SIERRA
   ```

h) Check if the new driver package is available:

   ```powershell
   # Get-EsxSoftwarePackage
   ```

i) Add the software package to the new image profile:

   ```powershell
   # Add-EsxSoftwarePackage -ImageProfile "ESXi 5.0 Adaptec Series 7H" -SoftwarePackage scsi-adp80xx
   ```

j) Export the custom ISO image:
# Export-EsxImageProfile -ImageProfile "ESXi 5.0 Adaptec Series 7H"
-FilePath C:\ESXi5.0-PMC-CustomISO\ESXi5.0-PMC-Sierra-Series-7H.iso
-NoSignatureCheck -ExportToISO

where -FilePath specifies the path to the custom iso image.

7. Burn the custom ISO image to a writable CD.
   
   **Note:** Use whatever tool you prefer to burn the CD, such as an interactive (GUI-based) tool or a command line tool.
   
   Remove the CD after you finish burning the image.

8. On the VMware ESXi machine, insert the custom boot CD, then restart your computer.
9. Follow the on-screen instructions to begin the VMware installation.
10. Complete the VMware installation, following the on-screen instructions.
11. Remove the custom boot CD, then reboot your computer.
6 Installing the Driver on an Existing Operating System

This chapter explains how to install your Adaptec HBA driver on an existing operating system. It assumes that the HBA and OS are installed and that you want to update the driver software.

**Note:** To install the driver while you’re installing the operating system, see *Installing the Driver and an Operating System* on page 27.

### Before You Begin

- Create a driver disk (see following section)

  **Note:** For up-to-date operating system version support or to download the latest drivers, visit the Adaptec Web Site at [www.adaptec.com](http://www.adaptec.com). From the main menu select Support>Knowledgebase>Advanced Search>Limit by Category>OS type or Limit by Category>Downloads, enter your adapter model, then click Search.

### Creating a Driver Disk

- For Windows, the driver is loaded directly from the Adaptec Installation DVD.
- For Red Hat Linux, copy the driver from the Adaptec Installation DVD to the local machine.
- For VMware, copy the driver from the Adaptec Installation DVD to a local directory on the ESXi server.

Continue with the instructions for your operating system, below.

### Installing on Windows

**Note:** Use the following procedure for all supported Windows versions (for a complete list, see *System Requirements* on page 13.)

To install the driver on Windows:

1. Start or restart Windows.
2. In the Windows Control Panel, start the Device Manager.
3. Insert the Adaptec Installation DVD.
4. In the Storage Controllers section of Device Manager, right-click the Adaptec HBA, select **Update Driver Software**, then select **Browse my computer for driver software** and navigate to the Windows driver folder on the Adaptec Installation DVD.
5. Follow the on-screen instructions to load the driver.
6. When the installation is complete, remove the driver disk and restart your computer.

### Installing on Red Hat Linux

To install the driver on Red Hat Linux:

1. Insert and mount the Adaptec Installation DVD:

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Hat</td>
<td>mount /dev/cdrom /mnt/cdrom</td>
</tr>
</tbody>
</table>

2. Copy the driver from the installation DVD to the local machine (/tmp in this example):

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Hat</td>
<td>cp /mnt/cdrom/linux/driver/RHEL_6.3/yyy.rpm /tmp</td>
</tr>
</tbody>
</table>

   where *yyy.rpm* is the rpm file. The distribution includes a 32-bit and 64-bit driver.

3. Install the module RPM:
rpm -ivh /tmp/yyy.rpm

where **yyy.rpm** is the rpm file for your OS.

4. Reboot your computer.

### Installing on VMware

To copy the driver VIB file to the VMware ESXi server (in **Step 2** below), you must use a remote copy utility, such as WinSCP, putty, or Linux scp.

**Note:** You must remove the old driver before you can install the new one. You must have root privilege to install the new driver.

To install the driver on VMware:

1. At the VMware console screen, type these commands to remove the old driver:

   ```
   esxcli software vib list | grep -i scsi-adp80xx (list driver packages)
   esxcli software vib remove --vibname=scsi-adp80xx --maintenance-mode (remove package)
   ```

2. Using a remote copy utility, copy the driver VIB file from the esx5.0 folder on the Adaptec Installation DVD to a local directory on the ESXi server. This example uses Linux scp to copy the driver to /tmp:

   ```
   scp
   /mnt/cdrom/esx5.0/scsi-adp80xx-1.0.0.<drv-version>-1OEM.500.0.0.472560.x86_64.vib
   root@<esx-server-ip>:/tmp
   ```

3. Install the VIB module:

   ```
   esxcli software vib install -f -v
   file:/tmp/scsi-adp80xx-1.0.0.<drv-version>-1OEM.500.0.0.472560.x86_64.vib
   ```

4. Reboot your computer.
7 Solving Problems
This section provides basic troubleshooting information and solutions for solving problems with your Adaptec Host Bus Adapter.

Troubleshooting Checklist
If you encounter difficulties installing or using your Adaptec Host Bus Adapter, check these items first:

• With your computer powered off, check the connections to each disk drive, power supply, LED connector, and so on.
• Try disconnecting and reconnecting disk drives from the adapter.
• Check that your adapter is installed in a compatible PCIe expansion slot. To double-check the bus compatibility of your HBA, see About Your Host Bus Adapter on page 14.
• Ensure that your adapter is firmly seated and secured in the PCIe expansion slot.
• If your adapter is not detected during system boot, try installing it in a different compatible expansion slot. (See Installing the Host Bus Adapter on page 25 for instructions.)
• Did the driver install correctly?
• If you have external disk drives (or other devices), are they powered on?
• Check the Readme on the installation DVD for compatibility issues and known problems.

If you are still unable to resolve a problem, you can find additional troubleshooting information and direction on the Adaptec Web site at www.adaptec.com or the Support Knowledgebase at ask.adaptec.com.

Resetting the Adapter
You may need to reset, or flash, your Adaptec Host Bus Adapter if it becomes inoperable or if a firmware upgrade is unsuccessful. Adaptec HBAs support a reset protocol called HDA mode flash. To locate the flash jumper on your HBA, see the illustrations in About Your Host Bus Adapter on page 14. For more information about HDA mode reset, contact your support representative.
Using the Adaptec HBA Configuration Utility

The Adaptec HBA Configuration utility is a BIOS-based utility that you can use to manage your HBA and the devices attached to it. It comprises a set of tools for viewing and modifying HBA properties and for formatting, verifying, and identifying disk drives.

Running the HBA Configuration Utility: Ctrl-A or uEFI/HII?

Your Adaptec Host Bus Adapter supports two interfaces to the BIOS-level adapter configuration options described in this chapter: Ctrl-A and uEFI/HII.

On servers that support the Unified Extensible Firmware Interface, or uEFI (version 2.10 or higher), the BIOS-level configuration options are presented with a uEFI/HII interface (Human Interaction Infrastructure), rather than Adaptec’s legacy Ctrl-A interface. uEFI/HII provides an architecture-independent mechanism for initializing add-in cards, like the Adaptec Host Bus Adapter, and rendering contents to the screen in a uniform way.

To access the HBA configuration options with the Ctrl-A interface, start or restart your computer. When prompted, press Ctrl+A, then scan for and select your adapter (if you have more than one). The main menu is displayed.

![Options menu]

**Note:** The SerialSelect option is available only with the Ctrl-A interface.

In the uEFI/HII interface, access to the HBA configuration options is provided through the server’s standard BIOS. How you access the BIOS varies, depending on the server manufacturer, but typically it’s started by simply pressing DEL. Once you enter setup, navigate to the "Advanced" menu, select your adapter from the list (Adaptec SAS 7805H in the example below), then select "Device List" to see a list of drives on the adapter.

![BIOS menu]

From that point on, the uEFI/HII menus and the Ctrl-A menus for configuring your HBA are similar. For example, the Disk Utilities menu contains the same three options for formatting, verifying, and identifying disk drives.

In both interfaces, all the tools are menu-based and instructions for completing tasks appear on-screen. Menus can be navigated using the arrows, Enter, Esc, and other keys on your keyboard.

This chapter provides instructions for navigating and completing tasks with the Ctrl-A interface. To complete tasks with the uEFI/HII interface:
• Refer to the on-screen instructions for keyboard navigation and selection options.
• Refer to the option descriptions in this chapter for details about individual HBA configuration settings.

**Viewing HBA Properties**

**Note:** This option is available only in the Ctrl-A interface.

To view general information about your HBA, start the HBA Configuration Utility, then select **Controller Properties** from the Serial Select menu.

**Modifying HBA Settings**

**Note:** This option is available only in the Ctrl-A interface.

To modify your HBA’s general settings, start the HBA Configuration Utility, then select **Controller Configuration** from the Serial Select menu. You can set the options in the table below.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBS Support</td>
<td>When enabled in systems that support BBS, the HBA presents attached bootable devices up to the BIOS for boot device selection. Default is <strong>Device</strong>.</td>
</tr>
<tr>
<td>POST Banner Display</td>
<td>When enabled, a banner is displayed during system Power On Self Test (POST). Default is <strong>enabled</strong>.</td>
</tr>
<tr>
<td>Ctrl-A Message Display</td>
<td>When enabled, the Ctrl-A prompt is displayed during POST. Default is <strong>enabled</strong>.</td>
</tr>
<tr>
<td>Physical Drive Display During POST</td>
<td>When enabled, connected disk drives are displayed during POST. Displaying the disk drives adds a few seconds to the overall POST time. Default is <strong>enabled</strong>.</td>
</tr>
</tbody>
</table>

**Formatting and Verifying Disk Drives**

You can use the disk utilities to low-level format or verify your disk drives. (New disk drives are low-level formatted at the factory and do not need to be low-level formatted again.)

**Caution:** Before you format a disk drive, back up all data. Formatting destroys all data on a disk drive.

To format or verify a disk drive:

1. Start the HBA Configuration Utility (see **Running the HBA Configuration Utility: Ctrl-A or uEFI/HII?** on page 34).
2. Select **Disk Utilities** from the main menu.
3. Select a drive from the device list and press *Enter*.
4. Select **Format Disk** or **Verify Disk**.
5. Select **Yes**.

**Identifying Disk Drives**

You can use the disk utilities to identify a disk drive by blinking its LED.

**Note:** This feature is only available with disk drives that have an activity LED.

To identify a disk drive:

1. Start the HBA Configuration Utility (see **Running the HBA Configuration Utility: Ctrl-A or uEFI/HII?** on page 34).
2. Select **Disk Utilities** from the main menu.
3. Select a drive from the device list and press *Enter*.
4. Select **Indicate LED**.
5. Select 'Blink LED on Single Drive' or 'Blink LEDs on All Drives', then press *Enter*. 
6. When you have finished checking the drive, press any key to stop Blinking the LED.
B Adapter LED Connector Quick Reference
This section provides a quick reference for Adaptec HBA drive activity LED connectors.

Adaptec SAS Adapter 70165H/70165He/71605H/71605He LED Connector Specification

- Adaptec SAS Adapter 70165/71605 Activity LED Header Connector: Molex 015-91-3086 or equivalent
- Activity LED Header Mating Cable Connector: 6 pin 2.54mm pitch connector, Molex/Amp equivalent

<table>
<thead>
<tr>
<th>J4 Pin Number</th>
<th>Signal</th>
<th>Description</th>
<th>Mating Cable Pin Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PHY_ACT0_LED</td>
<td>LED Cathode</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>+3.3V</td>
<td>LED Anode</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>PHY_ACT1_LED</td>
<td>LED Cathode</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>+3.3V</td>
<td>LED Anode</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>PHY_ACT2_LED</td>
<td>LED Cathode</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>+3.3V</td>
<td>LED Anode</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>PHY_ACT3_LED</td>
<td>LED Cathode</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>+3.3V</td>
<td>LED Anode</td>
<td>7</td>
</tr>
</tbody>
</table>
Adaptec SAS Adapter 7085H/7805H LED Connector Specification

| 2278400-R | ASA-7085H SGL |
| 2280800-R | ASA-7805H SGL |

- Adaptec SAS Adapter 7085/7805 Activity LED Header Connector: Molex 015-91-3040 or equivalent
- Activity LED Header Mating Cable Connector: 6 pin 2.54mm pitch connector, Molex/Amp equivalent

<table>
<thead>
<tr>
<th>J4 Pin Number</th>
<th>Signal</th>
<th>Description</th>
<th>Mating Cable Pin Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PHY_ACT0_LED</td>
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<td>2</td>
<td>+3.3V</td>
<td>LED Anode</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>PHY_ACT1_LED</td>
<td>LED Cathode</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>+3.3V</td>
<td>LED Anode</td>
<td>3</td>
</tr>
</tbody>
</table>
C Safety Information

To ensure your personal safety and the safety of your equipment:

- Keep your work area and the computer clean and clear of debris.
- Before opening the system cabinet, unplug the power cord.

Electrostatic Discharge (ESD)

**Caution:** ESD can damage electronic components when they are improperly handled, and can result in total or intermittent failures. Always follow ESD-prevention procedures when removing and replacing components.

To prevent ESD damage:

- Use an ESD wrist or ankle strap and ensure that it makes skin contact. Connect the equipment end of the strap to an unpainted metal surface on the chassis.
- Avoid touching the adapter against your clothing. The wrist strap protects components from ESD on the body only.
- Handle the adapter by its bracket or edges only. Avoid touching the printed circuit board or the connectors.
- Put the adapter down only on an anti-static surface such as the bag supplied in your kit.
- If you are returning the adapter to Adaptec by PMC Product Support, put it back in its anti-static bag immediately.

If a wrist strap is not available, ground yourself by touching the metal chassis before handling the adapter or any other part of the computer.
Technical Specifications

Environmental Specifications

**Note:** Your Adaptec Host Bus Adapter requires adequate airflow to operate reliably. The recommended airflow is 200 LFM (linear feet per minute), minimum. Forced airflow is **required**.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature with forced airflow</td>
<td>0 °C to 55 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10% to 90%, non-condensing</td>
</tr>
<tr>
<td>Altitude</td>
<td>Up to 3,000 meters</td>
</tr>
</tbody>
</table>

**Note:** Ambient temperature is measured 1” from the HBA processor.

DC Power Requirements

<table>
<thead>
<tr>
<th>Bus Type</th>
<th>Description</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIe</td>
<td>Ripple and noise</td>
<td>Adaptec SAS Adapter 7xxx5: 3.3V: 50 mV peak-to-peak (max) 12V: 120 mV peak-to-peak (max)</td>
</tr>
<tr>
<td>PCIe</td>
<td>DC Voltage</td>
<td>Adaptec SAS Adapter 6xx5: 3.3V : 5.5 mV peak-to-peak (max) 12V : 80mV peak-to-peak (max)</td>
</tr>
</tbody>
</table>

Current Requirements

<table>
<thead>
<tr>
<th>Adaptec Model</th>
<th>Typical Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptec SAS HBA 70165H/70165He</td>
<td>0.17A @ 3.3 VDC; 1.25A @ 12.0 VDC</td>
</tr>
<tr>
<td>Adaptec SAS HBA 7085H</td>
<td>0.17A @ 3.3 VDC; 1.25A @ 12.0 VDC</td>
</tr>
<tr>
<td>Adaptec SAS HBA 71605H/71605He</td>
<td>0.17A @ 3.3 VDC; 1.25A @ 12.0 VDC</td>
</tr>
<tr>
<td>Adaptec SAS HBA 7805H</td>
<td>0.17A @ 3.3 VDC; 1.25A @ 12.0 VDC</td>
</tr>
<tr>
<td>Adaptec SAS HBA 6405H</td>
<td>0.09A @ 3.3 VDC; 0.7A @ 12.0 VDC</td>
</tr>
<tr>
<td>Adaptec SAS HBA 6805H</td>
<td>0.09A @ 3.3 VDC; 0.7A @ 12.0 VDC</td>
</tr>
</tbody>
</table>
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