

SATA RAID Cards

ARC-1200

(2-Port PCIe x1 to SATA RAID Controller)

Quick Installation Guide

Version: 1.1

Issue Date: November, 2008

Microsoft WHQL Windows Hardware Compatibility Test

Areca is committed to submitting products to the Microsoft Windows Hardware Quality Labs (WHQL), which is required for participation in the Windows Logo Program. Successful passage of the WHQL tests results in both the "Designed for Windows" logo for qualifying Areca PCI-Express SATA RAID controllers and a listing on the Microsoft Hardware Compatibility List (HCL).

Copyright and Trademarks

The information of the products in this manual is subject to change without prior notice and does not represent a commitment on the part of the vendor, who assumes no liability or responsibility for any errors that may appear in this manual. All brands and trademarks are the properties of their respective owners. This manual contains materials protected under International Copyright Conventions. All rights reserved. No part of this manual may be reproduced in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the manufacturer and the author. All inquiries should be addressed to Areca Technology Corporation.

FCC STATEMENT

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 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 instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

Contents

1. Introduction.....	4
1.1 Overview.....	4
1.2 Package Contents	4
1.3 Features.....	4
2. Hardware Installation	6
2.1 Board layout	6
2.2 Installation	7
3. Support RAID Levels.....	16
3.1 RAID 0	16
3.2 RAID 1	16
3.3 JBOD	16
3.4 Single Disk (Pass Through Disk)	17

Quick Installation Guide

1. Introduction

1.1 Overview

Thank you for purchasing the ARC-1200 SATA RAID controller. Please take a few minutes to read this quick installation guide before you install the controller. If you need more detailed information about this SATA RAID Controller, refer to the related documents on your MCRAID Software Suite CD.

1.2 Package Contents

Open the package carefully, and make sure that none of the items listed below are missing. **(disk drives and disk mounting brackets are not included):**

- 1 x PCIe x1 SATA RAID Controller in an ESD-protective bag
- 2 x SATA interface cables (one per port)
- 1 x MCRAID Software Suite CD
- 1 x Quick Installation Guide Manual

If any item is missing or damaged, please contact your local resellers for service.

1.3 Features

Adapter Architecture

- 400MHz Storage processor
- PCIe x1 bus
- DDR2 400 SDRAM
- Write-through or write-back cache support
- Support up to 2 SATA II drives
- Multi-adapter support for large storage requirements
- BIOS boot support for greater fault tolerance
- BIOS PnP (plug and play) and BBS (BIOS boot specification) support
- NVRAM for RAID configuration & transaction log
- Redundant flash image for adapter availability
- RoHS Compliant

Quick Installation Guide

RAID Features

- Support RAID level 0, 1, JBOD and Single Disk
- Multiple RAID selection
- Array roaming
- Online RAID level/stripe size migration
- Online capacity expansion and RAID level migration simultaneously
- Instant availability
- Automatic drive insertion / removal detection and rebuilding
- Greater than 2TB per volume set (64-bit LBA support)
- SMART disk drive monitoring for reliability

Monitors/Notification

- System status indication through HDD activity/fault connector, and alarm buzzer
- SMTP support for email notification
- SNMP support for remote Manager

RAID Management

- Field-upgradeable firmware in flash ROM

In-Band Manager

- Web browser-based McRAID Storage manager via Http Proxy Server for Windows, Linux and FreeBSD system
- Hot key "boot-up" McBIOS RAID manager via BIOS
- Support Command Line Interface (CLI)
- Support controller's API library for customer to write its own AP
- Single Admin Portal (SAP) monitor utility
- HDD Stress Test (HST) utility for production

Operating System

- Windows Vista/Server 2003/XP/2000
- RedHat Linux
- SuSE Linux
- FreeBSD
- Novell Netware 6.5
- Solaris 10 x86/x86_64
- SCO Unixware 7.1.4
- Mac OS X 10.4 and 10.5 Leopard

(For latest supported OS listing visit <http://www.areca.com.tw>)

Quick Installation Guide

2. Hardware Installation

2.1 Board layout

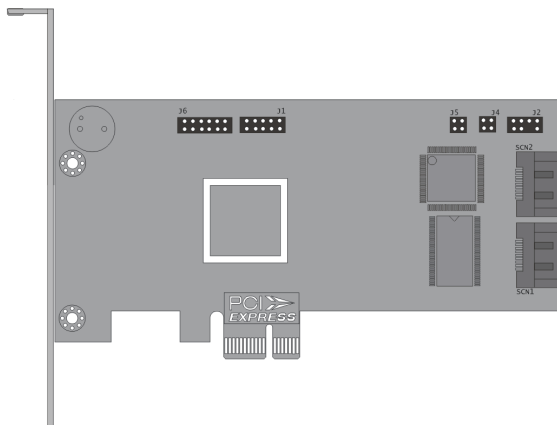


Figure 1-1, ARC-1200 (2-port PCIe X1 SATA RAID Controller)

Connector	Type	Description
1.(J6)	Reserved	12-pin Box header
2.(J1)	Reserved	12-pin header
3.(J5)	Individual Fault LED header	4-pin header
4.(J4)	Individual HDD LED header	4-pin header
5.(J2)	Reserved	8-pin header
6.(SCN2)	SATA Port	SATA Connector
7.(SCN1)	SATA Port	SATA Connector

Table 1-1, ARC-1200 Connectors

Quick Installation Guide

2.2 Installation

Step 1. Prepare the computer

Turn off the computer and unplug the power cord(s) from the back of the power supply. Remove the cover from the computer.

Step 2. Install the ARC-1200 SATA RAID Controller

To install the ARC-1200 SATA RAID controller, remove the mounting screw and existing bracket from the rear panel behind the selected PCIe slot. Insert the controller in a PCIe slot on a mainboard. Press gently but firmly down to ensure that controller is properly seated in the slot, as shown in Figure 1-2. Then screw the bracket into the computer chassis.

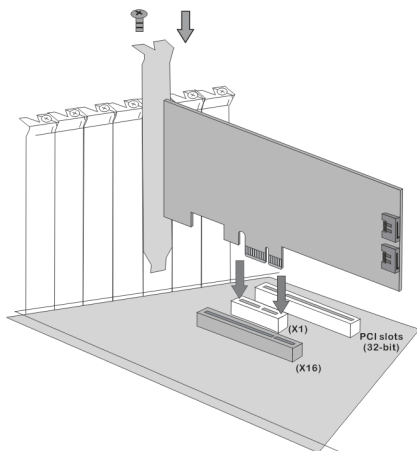


Figure 1-2, Insert ARC-1200 SATA RAID controller into a PCIe slot

Note:

The ARC-1200 SATA RAID controller requires a PCIe x1 slot (can operate in x2, x4, x8 and x16 slot). For more information about PCIe slot, please refer to your mainboard guide.

Quick Installation Guide

Step 3. Mount the Cages or Drives

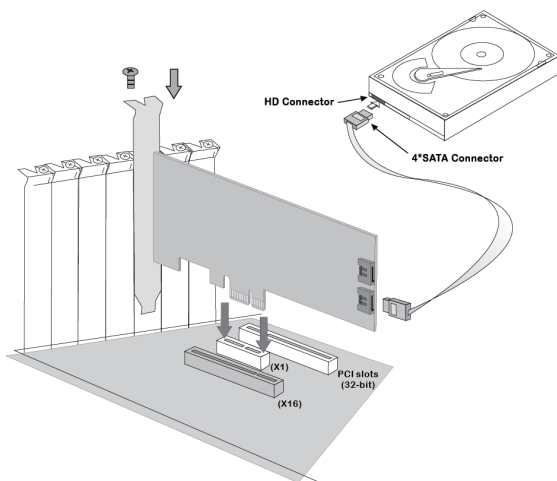
Remove the front bezel from the computer chassis and install the cages or SATA drives in the computer chassis. Loading drives to the drive tray if cages are installed. Be sure that the power is connected to either the Cage backplane or the individual drives.

Note:

The SATA cable connectors must match your HDD cage. For example: Channel 1 of RAID Card connects to channel 1 of HDD cage, channel 2 of RAID Card connects to channel 2 of HDD cage, and follow this rule.

Step 4. Connect the SATA cable

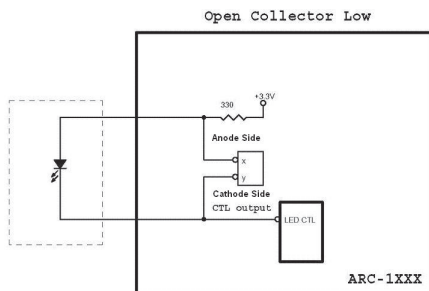
The ARC-1200 SATA RAID controller has two SATA internal connectors, use the cables which included in your kit. Connect the controller to the SATA hard drives. The cable connectors are all identical, so it does not matter which end you connect to your controller, SATA hard drive, or cage backplane SATA connector. Refer to Figure1-1 to view connector locations on the controller.



Quick Installation Guide

Step 5. Install the LED cable (optional)

The ARC-1200 SATA RAID controller provides two kinds of LED status connectors. The Fault/Activity and Global header intelligent electronics logic is as below.



The following position layout is for ARC-1200 Individual LED indicator connector, for each channel and Global LED indicator connector.

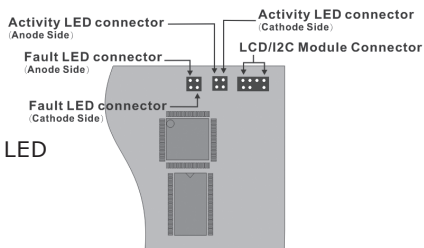


Figure 2-4, ARC-1200 global LED connection for Computer Case.

If the system uses only a single global indicator, attach the global indicator cable to the two pins HDD LED connector. Global LED indicator will light up when any drive is active.

Quick Installation Guide

The following diagrams is the HDD LED and Fault LED status description.

LED	Normal Status	Problem Indication
HDD LED	When the HDD LED is illuminated, there is I/O activity on that disk drive. When the HDD LED is dark, there is no activity on that disk drive.	N/A
Fault LED	When the fault LED is solid illuminated, there is no disk present and When the fault LED is off, that disk is present and status is normal. When the "Identify Drive" is selected, the selected drive Fault LED will blank.	When the Fault LED is slow blinking (2 times/sec), that indicate disk drive has failed and should be hot-swapped immediately. When the HDD LED is illuminated and Fault LED is fast blinking (10 times/sec) that indicate there is rebuilding activity on the disk drive.

Refer to the ARC-1200 SATA RAID Cards User's Manual on the MCRAID Software Suite CD for detailed on Installing LED connector.

Step 6. Re-check the SATA HDD LED and Fault LED Cable connections

Be sure that the proper failed drive channel information is displayed by the Fault and HDD Activity LEDs. An improper connection will tell the user to "Hot Swap" the wrong drive. This will remove the wrong disk (one that is functioning properly) from the controller. This can result in failure and loss of system data.

Note:

You can view the supported operating systems and download the latest drivers for SATA RAID Cards on the Areca web site at:
<http://www.areca.com.tw/support/main.htm>.

Step 7. Power up the System

Check the installation thoroughly, reinstall the computer cover, and reconnect the power cords. Turn on the power switch at the rear of the computer (if equipped) and then press the power button at the front of the host computer.

Step 8. Configure volume set

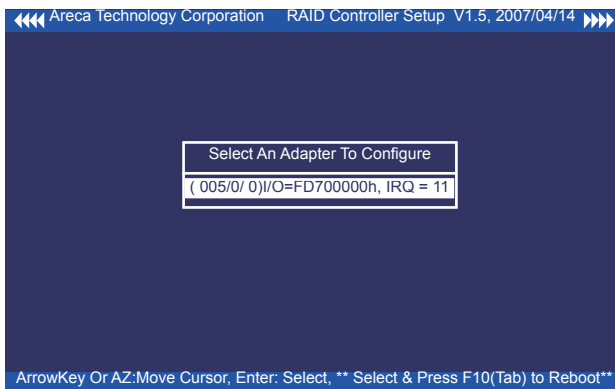
The ARC-1200 SATA RAID controller configures RAID functionality through the McBIOS RAID manager. The McBIOS RAID manager is designed to be user-friendly. It is a menu-driven program, residing in the firmware, which allows you to scroll through various menus and submenus and select among the predetermined configuration options. When starting a system with an SATA RAID controller installed, it will display the following message on the monitor during the startup sequence (after the system bios startup screen but before the operating system boots):

```
ARC-1xxx RAID Ctrl - DRAM: 128(MB) / #Channels: 8  
BIOS: V1.00 / Date: 2004-5-13 - F/W: V1.31 / Date: 2004-5-31
```

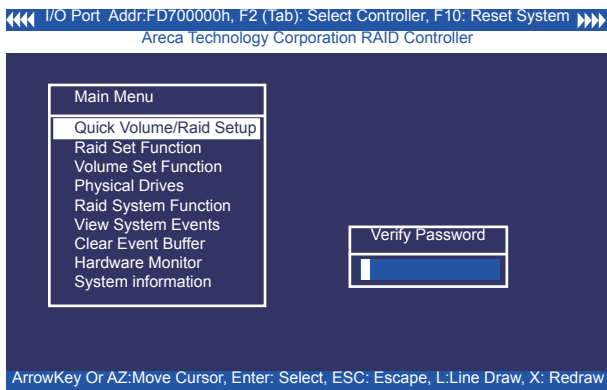
- ▶ I/O-Port=F3000000h, IRQ=11, BIOS ROM mapped at D000:0h
- ▶▶ No BIOS disk Found, RAID Controller BIOS not installed!
- ▶▶▶ Press <Tab/F6> to enter SETUP menu. 9 second(s) left <ESC to Skip>..

The McBIOS RAID manager message remains on your screen for about nine seconds, giving you time to start the configure menu by pressing Tab or F6. If you do not wish to enter configuration menu, press <ESC> to skip configuration immediately. When activated, the McBIOS RAID manager appears showing a selection dialog box listing the SATA RAID controllers that are installed in the system. The legend at the bottom of the screen shows you what keys are enabled for the windows.

Quick Installation Guide



Use the “Up” and “Down” arrow keys to select the adapter you want to configure. While the desired adapter is highlighted, press the <Enter> key to enter the Main Menu of the McBIOS RAID manager.




Note:

The manufacture default password is set to **0000**; this password can be modified by selecting **Change Password** in the **Raid System Function** section.

Quick Installation Guide

For more detailed configuration about McBIOS RAID manager, refer to chapter 3 of ARC-1200 SATA RAID Cards User's Manual on the MCRAID Software Suite CD. The controller can also be configured through the McRAID storage manager software utility with ArchHttp proxy server installed. The McRAID storage manager current configuration screen displays the current configuration of your SATA RAID controller. It displays the Raid Set List, Volume Set List, and Physical Disk List. The RAID set information, volume set information, and drive information can also be viewed by clicking on the "Raid Set Hierarchy" screen. The current configuration can also be viewed by clicking on "Raid Set Hierarchy" in the menu.

[@Quick Function](#)
[@RaidSet Functions](#)
[@VolumeSet Functions](#)
[@Physical Drives](#)
[@System Controls](#)
[Information](#)
[RaidSet Hierarchy](#)
[System Information](#)
[Hardware Monitor](#)



Areca Technology Corporation

Raid Set Hierarchy

Raid Set	IDE Channels	Volume Set(Ch:Lun)	Volume State	Capacity
Raid Set # 00	Ch01	WD740ADFD-00NLR0(0/0/0)	Normal	74.4GB
Raid Set # 01	Ch02	WD1500ADFD-00NLR0(0/0/1)	Normal	150.0GB

IDE Channels

Channel	Usage	Capacity	Model
Ch01	Pass Through	74.4GB	WDC WD740ADFD-00NLR0
Ch02	Pass Through	150.0GB	WDC WD1500ADFD-00NLR3

To display RAID set information, move the mouse cursor to the desired raid set number, then click it. The RAID set information will be displayed. To display volume set information, move the mouse cursor to the desired Volume Set number, then click it. The volume set information will display. To display drive information, move the mouse cursor to the desired physical drive number, then click it. The drive information will be displayed. For this option, refer to the Chapter 6 of ARC-1200 SATA RAID Cards User's Manual on the MCRAID Software Suite CD.

Step 9. Install the operating system driver

For installing a new operation system or installing driver in an existing system, refer to Chapter 4 of ARC-1200 SATA RAID Cards User's Manual on the MCRAID Software Suite CD.

Step 10. Install the ArchHttp proxy Server

The ARC-1200 SATA RAID controller firmware has embedded the web-browser RAID manager. ArchHttp proxy driver will enable it. The

Quick Installation Guide

browser-based RAID manager provides all of the creation, management, and monitor SATA RAID controller status. For more information about ArchHttp proxy server installation, refer to Chapter 5 of ARC-1200 SATA RAID Cards User's Manual on the MCRAID Software Suite CD. For SNMP agent function, please refer to Appendix C of ARC-1200 SATA RAID Cards User's Manual on the MCRAID Software Suite CD.

Step 11. Determining the Boot sequences

The ARC-1200 SATA RAID controller is a bootable controller. If your system already contains a bootable device with an installed operating system, you can set up your system to boot a second operating system from the new controller. To add a second bootable controller, you may need to enter setup and change the device boot sequence, so that the ARC-1200 SATA RAID controller heads the list configurable to allow itself to act as a second boot device.

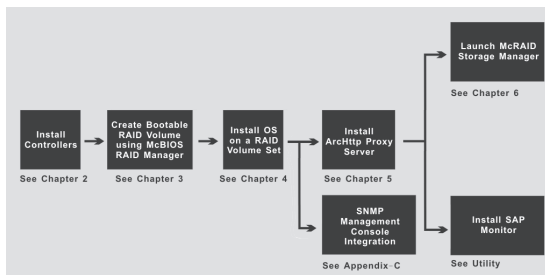
Summary of the installation

The flow chart below describes the installation procedures for ARC-1200 SATA RAID controller. These procedures include hardware installation, the creation and configuration of a RAID volume through the McBIOS, OS installation and installation of ARC-1200 SATA RAID controller software.

The software components configure and monitor the ARC-1200 SATA RAID controller via ArchHttp Proxy Server.

Configuration Utility	Operating System supported
McBIOS RAID Manager	OS-Independent
McRAID Storage Manager (Via Archhttp proxy server)	Windows 2000/XP/2003/Vista, Linux, FreeBSD, NetWare, UnixWare, Solaris and Mac
SAP Monitor (Single Admin portal to scan for multiple RAID units in the network, Via ArchHttp proxy server)	Windows 2000/XP/2003/Vista
SNMP Manager Console Integration	Windows 2000/XP/2003/Vista, Linux and FreeBSD

Quick Installation Guide



McRAID Storage Manager

Before launching the firmware-embedded web server, McRAID storage manager, you can to install the ArchHttp proxy server on your server system. If you need additional information about McRAID Storage Manager, refer to Chapter 6 of ARC-1200 SATA RAID Cards User's Manual on the MCRAID Software Suite CD.

SNMP Manager Console Integration

• In-Band-Using PCIe Bus

Before launching the SNMP agent in the sever, you need to enable the fireware-embedded SNMP community configuration first and install Areca SNMP extension agent in your server system. If you need additional information about SNMP Operation and Installation, refer to Appendix C of ARC-1200 SATA RAID Cards User's Manual on the MCRAID Software Suite CD.

Single Admin Portal (SAP) Monitor

This utility can scan for multiple RAID units on the network and monitor controller set status. It also includes a disk stress test utility to identify marginal spec disks before putting the RAID unit into a production environment.

For additional information, refer to Utility-SAP manual in the packaged CD-ROM or download it from the web site <http://www.arec.com.tw>

Quick Installation Guide

3. Support RAID Levels

RAID is an acronym for Redundant Array of Independent Disks. It is an array of multiple independent hard disk drives that provides high performance and fault tolerance. The ARC-1200 SATA RAID controller supports disk arrays using the following RAID levels:

3.1 RAID 0

RAID 0, also referred to as striping, writes stripes of data across multiple disk drives instead of just one disk drive. RAID 0 does not provide any data redundancy, but does offer the best high-speed data throughput. RAID 0 breaks up data into smaller blocks and then writes a block to each drive in the array. Disk striping enhances performance because multiple drives are accessed simultaneously; the reliability of RAID Level 0 is less because the entire array will fail if any one disk drive fails, due to a lack of redundancy, the reliability of RAID Level 0 is less because the entire array will fail if any one disk drive fails.

3.2 RAID 1

RAID 1 is also known as “disk mirroring”; data written on one disk drive is simultaneously written to another disk drive. Read performance will be enhanced if the array controller can, in parallel, access both members of a mirrored pair. During writes, there will be a minor performance penalty when compared to writing to a single disk. If one drive fails, all data (and software applications) are preserved on the other drive. RAID 1 offers extremely high data reliability, but at the cost of doubling the required data storage capacity. But at the cost of doubling the required data storage capacity.

3.3 JBOD

(Just a Bunch Of Disks) A group of hard disks in a RAID controller are not set up as any type of RAID configuration. All drives are available to the operating system as an individual disk. JBOD does not provide data redundancy.

3.4 Single Disk (Pass Through Disk)

Pass through disk refers to a drive that is not controlled by the RAID firmware and thus can not be a part of a RAID volume. The drive is available to the operating system as an individual disk.