

# **SAS JBOD Enclosure**

**ARC-4036**

(8-Bays 6Gb/s SAS Tower JBOD Enclosure)

## **USER'S Manual**

Version: 2.0

Issue Date: November, 2010

## 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.

## 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.

## Manufacturer's Declaration for CE Certification

We confirm ARC-4036 has been tested and found comply with the requirements set up in the council directive on the approximation of the law of member state relating to the EMC Directive 2004/108/EC. For the evaluation regarding to the electromagnetic compatibility, the following standards where applied:

EN 55022: 2006, Class B  
EN 61000-3-2: 2006  
EN 61000-3-3: 1995+A1: 2001+A2: 2005

EN 55024:1998+A1:2001=A2:2003  
IEC61000-4-2: 2001  
IEC61000-4-3: 2006  
IEC61000-4-4: 2004  
IEC61000-4-5: 2005  
IEC61000-4-6: 2006  
IEC61000-4-8: 2001  
IEC61000-4-11: 2004

# Contents

<b>1. Introduction .....</b>	<b>4</b>
1.1 Overview .....	4
1.2. Features .....	4
<b>2. Hardware Installation .....</b>	<b>7</b>
2.1 Before You First Installing.....	7
2.2 ARC-4036 JBOD Enclosure View .....	8
2.3 Locations of the Subsystem Component .....	9
2.3.1 Drive Tray LED Indicators .....	9
2.3.2 SAS Host/Expander LED Indicators .....	10
2.4 Installation.....	11
<b>3. CLI Features.....</b>	<b>18</b>
3.1 Expander RS-232C Port Pin Assignment .....	18
3.2 Start-up VT100 Screen .....	19
3.3 Command .....	22
• Help Command .....	22
• PASS Command .....	22
• LO Command .....	23
• LINK Command .....	23
• GROUP Command .....	24
• SYS Command.....	26
• SPIN Command .....	28
• ST Command.....	28
• LSD Command.....	29
• SHOWLOGS Command.....	30
• FDL Command.....	31

# INTRODUCTION

---

## 1. Introduction

This section presents a brief overview of the ARC-4036 compact tower 6Gb/s SAS JBOD enclosure.

### 1.1 Overview

The ARC-4036 SAS-to-SAS JBOD enclosures provides a compact external storage chassis capable of accommodating up to 8 6Gb/s, Serial-Attached SCSI (SAS) drives or 6Gb/s Serial ATA (SATA) drives. Each ARC-4036 JBOS enclosure connects to the host system through two 4-lanes SAS connectors (Host In) and two 4-lanes SAS connectors (Exp. Out) to the next SAS-to-SAS JBOD enclosure. It is used to enhance the ARC-4036 JBOD enclosure by allowing support for more than 8 internal hard disk drives.

Configuration and environmental information is accessible either via in-band (SES-2 and SMP) or out-of-band serial port. ARC-4036 is ideal for 6Gb/s SAS storage subsystem with external interfaces and get the benefits of more storage capacity. The type and total amount of drives you use are based on the host interface in the server that the JBOD is connected. Host-based RAID configuration is supported via an external SAS/Fibre/iSCSI/PCIe 2.0 to 6Gb/s SAS RAID controller, external series 6Gb/s SAS RAID and SAS host adapters. In data center environments, identifying issues with drives and environments are crucial. The hardware monitor can monitor system voltage and temperature. The warning message will be shown in event log, alarm buzzer and respect LED.

### 1.2. Features

#### **Drives**

SAS hard drives

- Up to 8 2.5-inch or 3.5-inch SAS hot-plug hard drives (6.0 Gb/s) at speeds of 7.2K, 10K or 15K rpm

SATA hard drives

- Up to 8 2.5-inch or 3.5-inch SATA hot-plug hard drives (6.0 Gb/s) at speeds of 7.2K or 10K rpm

# INTRODUCTION

---

## **JBOD Controller Module**

Expander board	1 module
Sensors	1 sensor

## **Backplane Board**

Connectors

- 8 SAS hard-drive connectors
- 1 power supply connector
- 2 cooling fan module connectors
- 1 sets of expander board connector

## **Controller Back-Panel Connectors**

SAS connectors

- 2 SAS "Host In" connectors for connection to the host
- 2 SAS "Expansion Out" connectors for expansion to an additional JBOD enclosure

Serial connector

- 1 6-pin UART RJ-11 connector

## **LED Indicators**

Hard-drive carrier

- 1 single-color activity LED status indicator
- 1 two-color fault/power LED status indicator

Expander board

- 2 single-color LED status indicators for each SAS port, one for link and one for the activity status

## **Power Supplies**

- Wattage 220 W maximum continuous
- Voltage 90–256 V rated
- Frequency 50–60 Hz
- Amperage +12V/16A, +5V/16A, +3.3V/14A

## **Cooling Fan**

- Speed 2 X 2700rpm/brushless fan
- Amperage 2 X 0.135A

## **Physical**

- Height 302 mm

# INTRODUCTION

---

- Width 146 mm
- Depth 290 mm
- Weight 14.9lbs/6.8 kg (without disk)

## **Environmental**

Temperature:

Operating

0° to 40°C

Storage

-40° to 60°C

Relative humidity:

Operating

10% to 80% (non-condensing)

Storage

5% to 95% (non-condensing)

## 2. Hardware Installation

This section describes how to install the ARC-4036 compact tower 6Gb/s SAS JBOD enclosure with host computer and disks.

### 2.1 Before You First Installing

Thanks for purchasing the ARC-4036 as your compact tower JBOD data storage enclosure. The following manual gives simple step-by-step instructions for installing and configuring the ARC-4036 JBOD enclosure.

#### **Unpack**

Unpack and install the hardware in a static-free environment. The ARC-4036 JBOD enclosure is packed inside an anti-static bag between two sponge sheets. Remove it and inspect it for damage. If the ARC-4036 JBOD enclosure appears damaged, or if any items of the contents listed below are missing or damaged, please contact your dealer or distributor immediately.

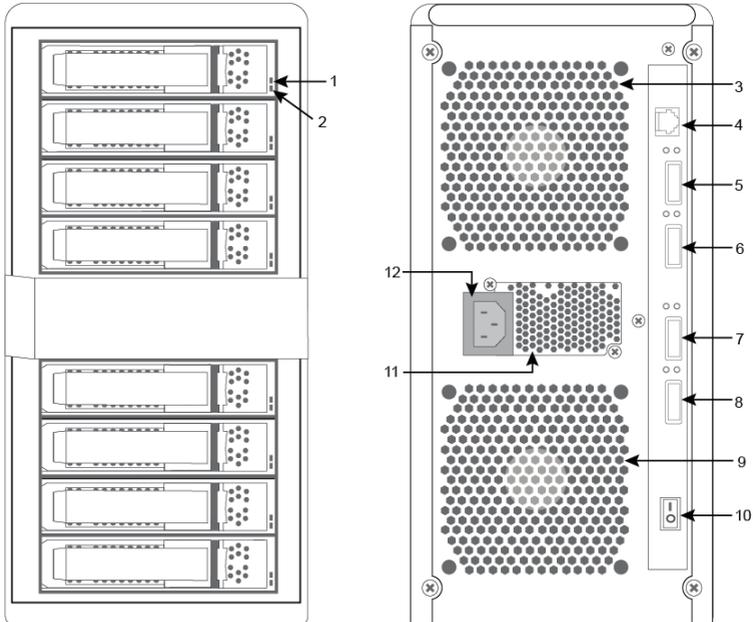
#### **Checklist**

- ARC-4036 8-bays compact tower JBOD enclosure
- SFF-8088 to SFF-8088 cable (option)
- Power cord
- RJ11 to DB9 serial communications null-modem cable
- 32 x drive mounting screws (4 per drive tray)
- ARC-4036 user manual

# HARDWARE INSTALLATION

## 2.2 ARC-4036 JBOD Enclosure View

The following diagram is the ARC-4036 compact tower JBOD enclosure front view and rear view.



Front View	Rear View
<ul style="list-style-type: none"><li>1. Disk Activity LED</li><li>2. Disk Fault/Power LED</li></ul>	<ul style="list-style-type: none"><li>3. System Fan</li><li>4. RS232 Port</li><li>5. SAS Host Port0 (CH0)</li><li>6. SAS Host Port1 (CH1)</li><li>7. SAS Expander Port0 (CH2)</li><li>8. SAS Expander Port1 (CH3)</li><li>9. System Fan</li><li>10. On/Off Switch</li><li>11. Power Supply Fan</li><li>12. Power Connector</li></ul>

# HARDWARE INSTALLATION

## 2.3 Locations of the Subsystem Component

The following describes the activity and fault LED location and function.

### 2.3.1 Drive Tray LED Indicators

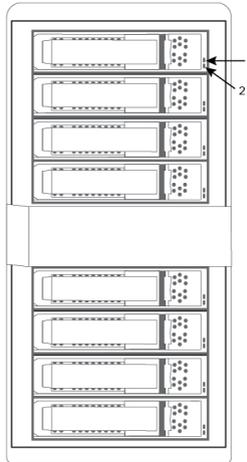
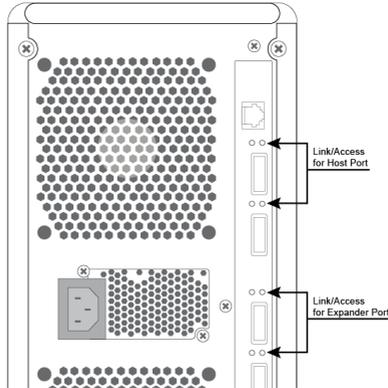


Figure 2-1, Activity/Fault LED for ARC-4036 compact tower JBOD enclosure

LED	Normal Status	Problem Indication
1. Activity LED (Blue)	When the activity LED is illuminated, there is I/O activity on that disk drive. When the LED is dark, there is no activity on that disk drive.	N/A
2. Fault/Power LED (Red/Green)	When the fault LED is solid illuminated, there is no disk present. When the power LED is solid illuminated and fault LED (red) is off, there is a disk present and normal status.	When the fault LED (red) is slow blinking (2 times/sec.), that disk drive has failed and should be hot-swapped immediately. When the activity LED (blue) is illuminated and fault LED (red) is fast blinking (10 times/sec.) there is rebuilding activity on that disk drive.

# HARDWARE INSTALLATION

## 2.3.2 SAS Host/Expander LED Indicators



The following table describes the ARC-4036 SAS compact tower JBOD enclosure host port link/activity LED.

Host Function LED	Status
Link LED (Green light)	When host port link LED is illuminated for 1 second and light off for 3 seconds that indicates one link has connected. When host port Link LED is illuminated for 2 seconds and light off for 2 seconds that indicates two links have connected. When host port Link LED is illuminated for 4 seconds that indicates four links have connected.
Activity LED (Blue light)	When activity LED is illuminated that indicates SAS host adapter accesses to the ARC-4036 JBOD enclosure.

The following table describes the ARC-4036 SAS compact tower JBOD enclosure expander port link/activity LED.

JBOD Function LED	Status
Link LED (Green light)	When expander port link LED is illuminated for 1 second and light off for 3 seconds that indicates one link has connected. When expander port Link LED is illuminated for 2 seconds and light off for 2 seconds that indicates two links have connected. When expander port Link LED is illuminated for 4 seconds that indicates four links have connected.
Activity LED (Blue light)	When activity LED is illuminated that indicates ARC-4036 expander port accesses to the SAS JBOD.

# HARDWARE INSTALLATION

## 2.4 Installation

Your enclosure supports up to 8 3.5-inch disk drives or 2.5-inch SAS or SATA 6.0Gb/s drives, each one contained in its individual drive carrier. Each drive is hot-pluggable, allowing you to remove and insert drives without shutting down your enclosure.

Following the instruction below to install ARC-4036 compact tower JBOD enclosure.

### Step 1. Installing SAS/SATA Drives in the ARC-4036 JBOD Enclosure

Follow the steps below to install the 3.5-inch drives or 2.5-inch drives into the drive tray.

- a. Install the drives into the drive tray and make sure the holes of the disk trays align with the holes of the drive.

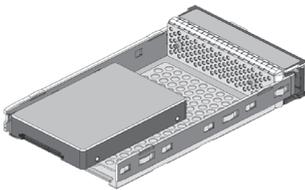


Figure 2-2, Put 2.5-inch SAS/SATA drive into disk tray

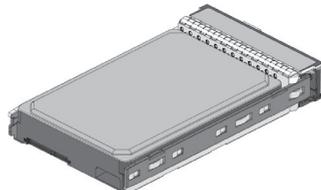


Figure 2-3, Put 3.5-inch SAS/SATA drive into disk tray

- b. Turn the drive tray upside down and using a screwdriver to secure the drive to the drive tray by four of the mounting screws.



Figure 2-4, Drive carrier with 2.5-inch SAS/SATA drive



Figure 2-5, Drive carrier with 3.5-inch SAS/SATA drive

# HARDWARE INSTALLATION

---

c. After all drives are in the drive tray, slide all of them back into the ARC-4036 JBOD enclosure and make sure you latch the drive trays.

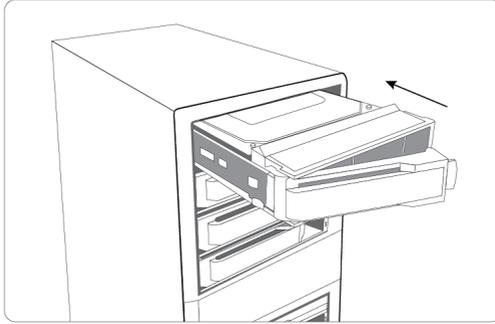


Figure 2-6, Slide drive tray back into the ARC-4036

## **Note:**

Please secure four of the mounting screws to the tray, otherwise the ARC-4036 may produce an annoying BUZZ sound in a few environments.

## **Step 2. Connecting ARC-4036 SAS JBOD Enclosure to Host Computer or Next JBOD**

The external host and expansion connectors are provided on the back of the SAS JBOD enclosure for connecting the JBOD to external RAID controller, server host adapter or next JBOD. There are two host SFF-8088 connectors and two expansion SFF-8088 connectors on the rear of ARC-4036.

### **• Host Port Connection**

By installing host port adapter and ARC-4036 Host Port0 and Host Port1 using the correct external cables which are included in your SAS JBOD enclosure kits. Then connect ARC-4036 SAS JBOD enclosure and host port adapter as shown below:

(a). Basic Connection

Connect the ARC-4036 to a single host using one SFF-8088 cable.

# HARDWARE INSTALLATION

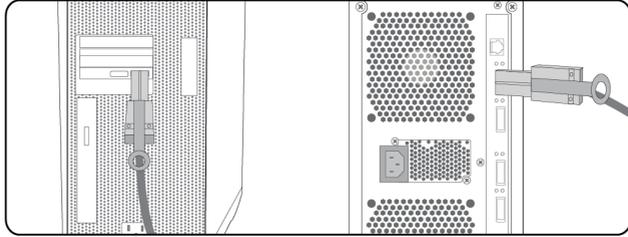


Figure 2-7, Connect ARC-4036 SAS JBOD enclosure and host adapter

## **Note:**

Turn on the ARC-4036 SAS JBOD enclosure first to make sure the host adapter or RAID controllers on the server recognizes the drives in the subsystem.

### (b). Performance Connection

Connect the ARC-4036 to a dual host controller board using two SFF-8088 cables. This configuration can get the benefit of better performance.

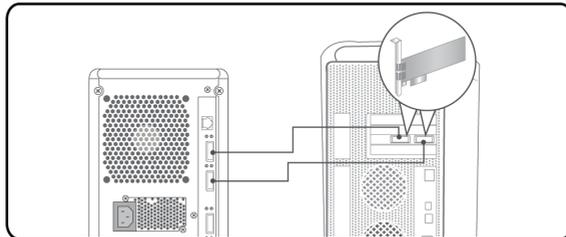


Figure 2-8, Connect ARC-4036 SAS JBOD enclosure and a dual host adapter

### (c). Failover Connection

Connect the ARC-4036 dual host ports to dual host controller boards using two SFF-8088 cables. This configuration can get the failover function on the host controllers.

# HARDWARE INSTALLATION

---

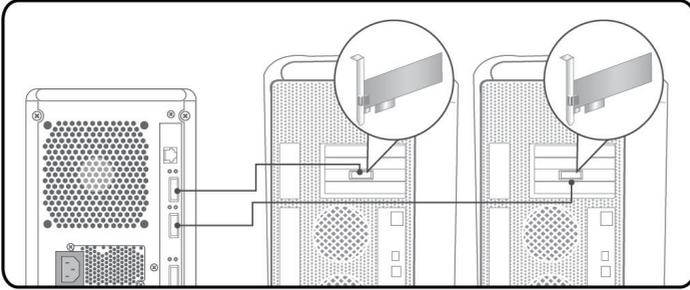
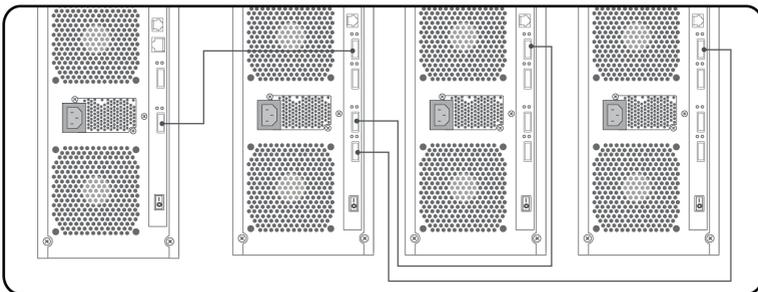


Figure 2-9, Connect ARC-4036 SAS JBOD enclosure and two host adapters

- **Expander Port Connection**

ARC-4036 SAS JBOD enclosure is a device that contains two expander ports. Expander ports may support being attached to SAS initiator ports, SAS and/or SATA target ports, and to other expander ports. The SAS JBOD enclosure can support daisy-chain how many SAS JBOD enclosures which depend on the host RAID controller's or server host adapter's firmware. The SAS JBOD enclosure can support daisy-chain up to 8 subsystems using Areca SAS RAID controllers. The following figure shows how to connect the external Min SAS cable from the ARC-4036 SAS JBOD enclosure to the external ARC-8040 SAS RAID subsystem. Daisy-chains longer than the limitation of subsystems are not supported even if it may be workable.



The following example table is the max no. of ARC-4036 SAS JBOD enclosure with Areca ARC-8040 RAID subsystem supported:

# HARDWARE INSTALLATION

	Disks/ Subsystem	Expander	Devices/Controller	Volume
Max No.	8	8	64	128

**Note:**

Turn on the expander enclosure first to make sure the SAS RAID controller or SAS host adapter recognizes the drives in the enclosure.

### Step 3. Connecting RS232C Monitor Port

You can connect RS-232 port to the manager client system. It is easy to configure and manage the JBOD enclosure from the client system. The ARC-4036 JBOD enclosure can be configured via a VT-100 compatible terminal or a PC running a VT-100 terminal emulation program. You can attach a serial (Character-Based) terminal or server com port to the SAS JBOD enclosure for access to the text-based setup menu.

### Step 4. Power Up the JBOD Enclosure

Turn on the AC power switch from power supply on the rear side of the ARC-4036 JBOD enclosure.

- a. Using the included power cord, connect this power cord to a grounded electrical outlet and to the ARC-4036 JBOD enclosure. (manufacturer recommends that you use an uninterruptible power supply to protect your ARC-4036 SAS JBOD enclosure.)
- b. Turn on the AC power switch from the back of ARC-4036 JBOD enclosure.

# HARDWARE INSTALLATION

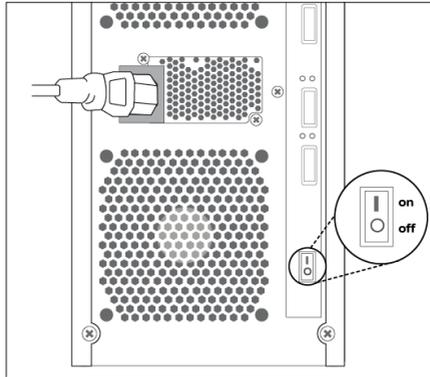


Figure 2-10, Connect the power cord to a grounded electrical outlet and to the ARC-4036 JBOD enclosure.

## Step 5. Configure JBOD Enclosure

Your ARC-4036 JBOD enclosure can be configured by using a serial device (terminal emulation). The ARC-4036 JBOD enclosure can be configured via a VT-100 compatible terminal or a PC running a VT-100 terminal emulation program. You can attach a serial (Character-Based) terminal or server com port to the JBOD enclosure for access to the text-based setup menu. For additional information on using the RS-232 port to configure the JBOD enclosure see the Chapter 3 of CLI Features.

## Step 6. Turn on Host Computer Power

Safety checks the installation. Connect all power code. Turn on the AC power switch at the rear of host computer then press the power button at the front of the host computer.

### **Note:**

It is a good idea to turn on your ARC-4036 Compact Tower-JBOD enclosure before turning on the host computer. This will insure that the host computer recognizes the volumes and drives in the ARC-4036 JBOD enclosure. If you turn on the host computer first, be sure of your host subsystem supporting hot-plug function or rescan command to recognize the ARC-4036 JBOD enclosure again.

# HARDWARE INSTALLATION

---

## **Step 7. Format, Partition and Mount the ARC-4036 JBOD Enclosure Volumes**

After the volume set is ready for system accesses, it needs to be partitioned, formatted, and mounted by the operating system. There are various steps, depending on what operating system you are using (Windows, Linux, FreeBSD or Mac, etc.). Detailed steps for each operating system are provided on their disk utility. After that, the ARC-4036 JBOD enclosure can be fully used.

# CLI FEATURES

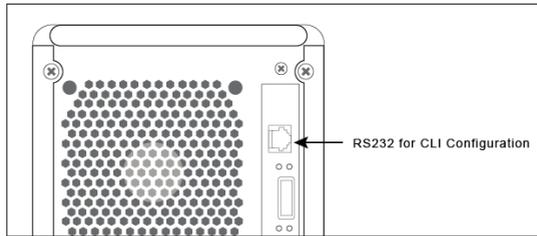
---

## 3. CLI Features

This Command Line Interface (CLI) is provided for you to configure the 8 bays compact tower JBOD enclosure functions. The CLI is useful in environments where a graphical user interface (GUI) is not available.

- **Locations of RS-232C Port**

The ARC-4036 JBOD enclosure uses the RJ11 port as the serial port interface. Please use the cable included on the shipping box to configure the expander controller.



- **Establishing the Connection for the RS-232 Port**

The CLI function can be done by using an ANSI/VT-100 compatible terminal emulation program. You must complete the appropriate installation procedure before proceeding with the CLI function. Whichever terminal emulation program is used must support the 1K XMODEM file transfer protocol.

The serial port on the SAS expander controller's back panel can be used in VT100 mode. The provided interface cable converts the RS-232 signal of the RJ11 connector on the SAS expander controller into a 9-pin D-Sub male connector. The firmware-based terminal SAS expander management interface can access the expander through this RS-232 port. You can attach a VT-100 compatible terminal or a PC running a VT-100 terminal emulation program to the serial port for accessing the text-based setup menu.

### 3.1 Expander RS-232C Port Pin Assignment

To ensure proper communications between the SAS expander controller and the VT-100 Terminal Emulation, Please configure the VT100 terminal emulation settings to the values shown below:

Terminal requirement	
Connection	Null-modem cable
Baud Rate	115,200
Data bits	8
Stop	1
Flow Control	None

The controller RJ11 connector pin assignments are defined as below.

Action			
Pin	Description	Pin	Description
1	RTS	4	GND
2	RXD	5	GND
3	TXD	6	GND

## 3.2 Start-up VT100 Screen

By connecting a VT100 compatible terminal, or a PC operating in an equivalent terminal emulation mode, all CLI administration functions can be exercised from the VT100 terminal.

There are a wide variety of Terminal Emulation packages, but for the most part they should be very similar. The following setup procedure is an example setup VT100 Terminal in Windows XP system using Hyper Terminal use Version 3.0 or higher.

**Step 1.** Open the "Taskbar Start"/"Programs"/"Accessories"/"Communications"/"Hyper Terminal". (Hyper Terminal requires version 3.0 or higher) (Figure 3.2-1)

**Step 2.** Open "HYPERTRM.EXE". (Figure 4.3-2)



Figure 3.2-1



Figure 3.2-2

# CLI FEATURES

**Step 3.** Enter a name you prefer and then click "OK". (Figure 3.2-3)

**Step 4.** Select an appropriate connecting port and then click "OK". (Figure 3.2-4)

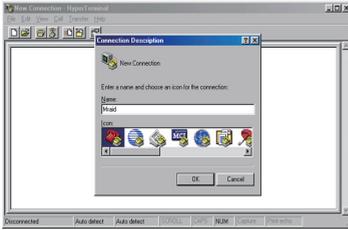


Figure 3.2-3

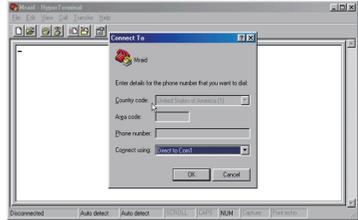


Figure 3.2-4

**Step 5.** Configure the port parameter settings and then click "OK".  
Bits per second: 115200

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None (Figure 3.2-5)

**Step 6.** Open the file menu and select "Properties". (Figure 3.2-6)



Figure 3.2-5

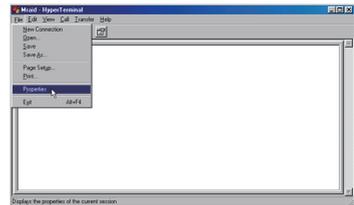


Figure 3.2-6

**Step 7.** Configure the "Connect To" setting. (Figure 3.2-7)

**Step 8.** Configure the "Settings" items and then click "OK".

Function, arrow and ctrl keys act as: Terminal keys

Backspace key sends: Ctrl+H

Emulation: VT100

Telnet terminal: VT100

Back scroll buffer lines: 500 (Figure 3.2-8)

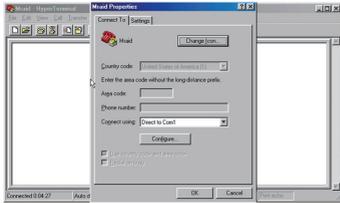


Figure 3.2-7

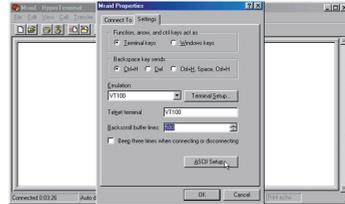


Figure 3.2-8

Now, The VT100 is ready to be used.

After you finished the VT100 Terminal setup, you may press " X " key (in your Terminal) to link the expander CLI setup screen and Terminal together.

Press "X" key to display the expander CLI utility screen on your VT100 Terminal. The CLI prompt is displayed in a DOS console window. Press "H" to display the sub-manual.

# CLI FEATURES

---

## 3.3 Command

This section provides detail information about the ARC-4036 compact tower JBOD enclosure's CLI function. All the commands please type in lower case.

### ● Help Command

This command provides an on-line table of contents, providing brief descriptions of the help sub-commands. You can use the <CLI> help to get detail information about the CLI commands summary.

#### **Syntax**

```
CLI>help[Enter]
```

Example:

```
CLI>help
```

```
pass      - Set Password
lo        - Logout CLI Shell
link      - Link Rate Control
group     - Set the PHY Group
sys       - System Information
spin     - Drive SpinUp Control
st        - Store System Setting
lsd       - List Devices Status
showlogs  - Show the Current Logs
fld       - File Download
```

### ● PASS Command

The pass command allows user to set or clear the enclosure password protection feature. Once the password has been set, the user can only monitor and access the enclosure setting by providing the correct password. The password can accept max. 8 chars and min. 4 chars. The manufacture default password is "0000".

#### **Syntax**

```
CLI>pass [Enter]
```

Example:

```
CLI>pass
Old Password:****
New Password:****
Verify New Password:****
Password Changed But Not Save Permanently!
Note, use CLI command "st" to keep permanently.
```

## ● LO Command

To exit the selected enclosure CLI shell, use the lo command.

### Syntax

```
CLI> lo [Enter]
```

Example:

```
CLI> lo
Password:
```

## ● LINK Command

The link command allows you to set the operate device link rate that has been connected on enclosure. Typical parameters include: Max and Min disk speed connected the SAS enclosure.

### Syntax

```
CLI>link [Index Max Min] [Enter]
```

Index: Slot Index

Max, Min: speed code, 8 means 1.5G, 9 means 3.0G and 10 means 6.0G

PS. Pls. Save Config. & Reboot To Take Effect

```
CLI>st
```

Example:

```
CLI>link
```

ArrayDevice Element (0x17):

```
=====
NAME      PHY  NLR  MAX  MIN  TYPE  ADDRESS
SLOT 01   0   3.0G  10   8   SAS  5000C500-0D2002D1
SLOT 02   1           10   8
SLOT 03   2           10   8
SLOT 04   3   1.5G  10   8   SATA 5001B469-84965C23
```

# CLI FEATURES

---

```
SLOT 05      8          10  8
SLOT 06      9  6.0G    10  8  SAS  5000C500-17C8FD25
SLOT 07      10         10  8
SLOT 08      11         10  8
```

//Set the slot 0x6 max. speed to 1.5G

CLI >link 6 9 8

CLI >link

ArrayDevice Element (0x17):

```
=====
NAME      PHY  NLR  MAX  MIN  TYPE  ADDRESS
SLOT 01   0  3.0G  10   8  SAS  5000C500-0D2002D1
SLOT 02   1           10   8
SLOT 03   2           10   8
SLOT 04   3  1.5G  10   8  SATA 5001B469-84965C23
SLOT 05   8           10   8
SLOT 06   9  6.0G   9   8  SAS  5000C500-17C8FD25
SLOT 07  10         10   8
SLOT 08  11         10   8
```

CLI>st

CLI>

Reboot to take effect.

CLI >link

ArrayDevice Element (0x17):

```
=====
NAME      PHY  NLR  MAX  MIN  TYPE  ADDRESS
SLOT 01   0  3.0G  10   8  SAS  5000C500-0D2002D1
SLOT 02   1           10   8
SLOT 03   2           10   8
SLOT 04   3  1.5G  10   8  SATA 5001B469-84965C23
SLOT 05   8           10   8
SLOT 06   9  3.0G   9   8  SAS  5000C500-17C8FD25
SLOT 07  10         10   8
SLOT 08  11         10   8
```

## ● GROUP Command

The group command is used to associate the external port with

the devices/phys as one zone group. The three external cable ports and all devices/phys slots will default associate with one zone group.

## Syntax

```
gr {dev GroupNo[1..] {ci, cj, ck,..} Start-Index(D) End-Index(D)
}
```

```
gr {off | [t10 off] }
```

dev : use drive slot index

GroupNo : groupno start from 1, max 8 groups ci, cj, ck,..:  
external cable connector. i,j,k,.. is the index which range from 0  
to 3. According to view from connector side, index start from  
right to left or top to bottom. The cable c0, c1, c2 or c3 is view  
from right to left or start from top to bottom.

Start-Index : Start slot index of zone range, [1.. max drive]

End-Index : End slot index of zone range, [1.. max drive]

off : clear the zone group setting.

t10 off : turn T10 mode off.

Example:

```
CLI>gr
```

```
Current PHY Group Mode: T10
```

```
Group-1: C0, C1, C2, C3 Slot: 1, 2, 3, 4, 5, 6, 7, 8
```

```
Value: 0x0000000FFFFFFFFF
```

```
//Set the cable0 and slot 1 to slot 6 as group 1
```

```
CLI>gr dev 1 c0 1 6
```

```
New PHY Group Mode: T10
```

```
Group-1: C0, Slot: 1, 2, 3, 4, 5, 6
```

```
Value: 0x000000000000FFC00
```

```
Current PHY Group Mode: T10
```

```
Group-1: C0,C1,C2, C3 Slot: 1, 2, 3, 4, 5, 6, 7, 8
```

```
Value: 0x0000000FFFFFFFFF
```

```
//Set the cable1 cable 2 and cable3 and slot 7 to slot 8 as group 2
```

```
CLI>gr dev 2 c1, c2, c3 7 8
```

# CLI FEATURES

---

New PHY Group Mode: T10  
Group-1: C0, Slot: 1, 2, 3, 4, 5, 6  
Value: 0x000000000000FFC00  
Group-2: C1, C2, C3 Slot: 7, 8  
Value: 0x0000000000FF003FF

Current PHY Group Mode: T10  
Group-1: C0, C1, C2 Slot: 1, 2, 3, 4, 5, 6, 7, 8  
Value: 0x0000000FFFFFFFF

CLI>st  
Power Cycle to reboot

CLI>gr

Current PHY Group Mode: T10  
Group-1: C0, Slot: 1, 2, 3, 4, 5, 6  
Value: 0x000000000000FFC00  
Group-2: C1, C2, C3 Slot: 7, 8  
Value: 0x0000000000FF003FF

//Clear the Zone group Setting  
CLI>gr off

New PHY Group Mode: T10  
Group-1: C0, C1, C2, C3 Slot: 1, 2, 3, 4, 5, 6, 7, 8  
Value: 0x0000000FFFFFFFF

Current PHY Group Mode: T10  
Group-1: C0, Slot: 1, 2, 3, 4, 5, 6  
Value: 0x000000000000FFC00  
Group-2: C1, C2, C3 Slot: 7, 8  
Value: 0x0000000000FF003FF

## ● **SYS Command**

The sys command is used to view the enclosure's information. Typical information includes: vendor, model name, serial/unit number, expander port number, product revision, chip name/chip revision, customer code, manufacture data revision and work time.

# CLI FEATURES

## Syntax

CLI>sys [Enter]

Example:

CLI>sys

=====  
=====

Hardware Revision Information:-

=====  
=====

Vendor ID : Areca Technology Co Ltd. Taiwan, R.O.C  
Model ID : ARC-4036  
Serial No. : 0000000000000000  
Unit Serial No. :  
Expander SAS Address : 0x5001B46984965C3F  
Product Revision : 0  
Expander Chip ID : 0x0221 (Ports : 28)  
Expander Chip Revision : B3  
Customer Code : 0x36  
Manufacturer Data Revision : 0xB2  
Working Time : Day00000-01:48:14

=====  
=====

Firmware Revision Information:-

=====  
=====

Active Firmware: Active Image

Boot Image:

Revision: 6.01.00.68 06/30/10

Firmware Family: 1 Fast Boot: No Image Address: 0x14000000

Active Image:

Revision: 6.01.00.68 06/30/10

Firmware Family: 1 Fast Boot: No Image Address: 0x14080000

Backup Image:

Revision: 6.01.00.68 06/30/10

Firmware Family: 1 Fast Boot: No Image Address: 0x14100000

# CLI FEATURES

---

## ● SPIN Command

The spin command defines the mode of staggering SATA drive spin-up function connected on the expander controller. This command gives expander controller the ability to spin up the disk drives sequentially or in groups, allowing the drives to come ready at the optimum time without straining the system power supply. Staggering drive spin-up in a multiple drive environment also avoids the extra cost of a power supply designed to meet short-term startup power demand as well as:

### Syntax

```
CLI> spin [ Delay(D)[ms] Num(D) ]
```

Expander issues the spin up the drives by [ Num] drives with [Delay] ms.

Example1:

```
CLI>spin
```

Current SpinUp Attribute:

Drive Number: 1

Delay: 1024 ms

```
CLI>spin 512 3
```

New SpinUp Attribute:

Drive Number: 3

Delay: 512 ms

Current SpinUp Attribute:

Drive Number: 1

Delay: 1024 ms

## ● ST Command

The st command stores system configurations in flash. Since all the revised parameter setting is temporarily stored in the working RAM, the ST command saves those parameters permanently in flash ROM.

### Syntax

```
CLI> st
```

Example:

```
CLI> st
```

```
CLI>
```

## ● LSD Command

The `lsd` command is used to show the element devices status in the expander controller. With parameter, this command only shows the select device status.

### Syntax

```
CLI> lsd [ hdd | temp | volt | pwr | con | ..]
```

Show SES elements information:

ArrayDevice Element (0x17):

```
=====
NAME          PHY  NLR  MAX  MIN  TYPE  ADDRESS
SLOT 01      0   3.0G  10   8   SAS  5000C500-0D2002D1
SLOT 02      1                   10   8
SLOT 03      2                   10   8
SLOT 04      3   1.5G  10   8   SATA 5001B469-84965C23
SLOT 05      8                   10   8
SLOT 06      9   6.0G  10   8   SAS  5000C500-17C8FD25
SLOT 07     10                   10   8
SLOT 08     11                   10   8
=====
```

Connector Element (0x19):

```
=====
NAME          PHY  NLR  TYPE  STATUS
Connector00  24                   02
Connector00  25                   02
Connector00  26                   02
Connector00  27                   02
Connector01  20   6.0G  02  Connected
Connector01  21   6.0G  02  Connected
Connector01  22   6.0G  02  Connected
Connector01  23   6.0G  02  Connected
Connector02  16                   02
Connector02  17                   02
Connector02  18                   02
Connector02  19                   02
Connector03  12                   02
Connector03  13                   02
Connector03  14                   02
Connector03  15                   02
=====
```

# CLI FEATURES

---

Cooling Element (0x03):

```
=====
          SPEED
NAME      CODE  RPM  STATUS
Fan 01    5    2200  OK
Fan 02    5    2250  OK
```

Temperature Element (0x04):

```
=====
NAME      ID  CT(^C)  HTW  LTW  OTWarn
ENC. Temp 01  34    60   5   No
Chip Temp 02  58    85   5   No
```

Voltage Element (0x12):

```
=====
NAME      VOLT(V)  OVLMT  UVLMT  STATUS
1V        0.98    1.07   0.94   None
5V        5.01    5.32   4.63   None
```

AudibleAlarm Element (0x06):

```
=====
NAME      STATUS  ALMSTATE
Audible-Alarm  Normal  0
```

CLI>lsd fan

Show SES elements information

Cooling Element (0x03):

```
=====
          SPEED
NAME      CODE  RPM  STATUS
Fan 01    5    2200  OK
Fan 02    5    2250  OK
```

## ● SHOWLOGS Command

The showlogs command allows you to display system event notifications that have been generated event by the SAS expander box.

## Syntax

```
CLI>showlogs [DisplayMode(hex, detail, default)]
```

Example:

```
CLI>showlogs
```

```
00000000-00000000:PLATFORM:Firmware initialization started
```

```
Day00000-00:00:00 ENCLOSURE-Fan 01 Failed
```

## ● FDL Command

The enclosure has added the firmware update through the CLI on the external RS-232 port. Before you process the firmware update, There are two block regions that you can update enclosure-microcode on SAS JBOD enclosure.

(1)CODE region - for FW file : sas2xfwXXXX.fw

(2)MFGB region - for Data file : mfgdat6gYYYY.rom

To update the enclosure firmware, follow the procedure below:

**Syntax:** all the commands please type in lower case

```
CLI>fdl { code | mfgb } offset[Enter]
```

Then use XModem/(Checksum) protocol transmit file to update ROM Region

The following procedures is used to update firmware through the RS-232:

- A. Open any UART communication tools like HyperTerminal(115200,n,8,1).
- B. Press any key on HyperTerminal window, the window will show "CLI>" prompt.
- C. Type help will show help screen.
- D. One command to update firmware. Step as follow,
- E. Issue download & update command under "CLI>".  
CLI>fdl code 0  
Please Use XModem Protocol for File Transmission.  
Use Q Or q to quit Download before starting XModem.  
<-----enclosure prompt for ready to receive file to update.
- F. Then under HyperTerminal program, use the pull down menu item transfer "Send" -> send files when dialog box prompt,

# CLI FEATURES

---

choose "Xmodem" and the file in the directory then press "send".

(1). If the expander receives the file under the timeout limit (60s), the process starts.

(2). If time out, please retry the step E again.

G. You can also cancel the program step by type 'q'.

H. If transfer OK, the transferred data is updated. Cold-start enclosure (Power cycle again) to take effect.

Example:

Update procedure, use Xmodem to transfer, refer to "fdl" command for detail operation.

```
CLI> fdl { code | mfgb } offset[Enter]
```

Use HyperTerminal or TeraTerm utility with Xmodem mode to transfer and update files.

If transfer OK, the transferred data is updated. Cold-start enclosure (Power cycle again) to take effect.

The following firmware and data are available in the following filename format.

(1)FW file (CODE) : sas2xfwXXXX.fw

(2)Data file (MFGB) : mfgdat6gYYYY.rom

Update SAS JBOD enclosure firmware:

```
CLI> fdl code 0
```

Use HyperTerminal or TeraTerm utility with Xmodem mode to transfer sas2xfwXXXX.fw.

If transfer OK, the transferred data is updated. Cold-start enclosure (Power cycle again) to take effect.

Update SAS JBOD enclosure data file:

```
CLI>fdl mfgb 0
```

Use HyperTerminal or TeraTerm utility with Xmodem mode to transfer mfgdat6gYYYY.rom.

If transfer OK, the transfered data is updated. Cold-start enclosure (Power cycle again) to take effect.