

# **SAS RAID Expander-CLI**

**ARC-1680ix-12/16/24** (3Gb/s SAS RAID Controller)

**ARC-1880ix-12/16/24** (6Gb/s SAS RAID Controller)

## **USER Guide**

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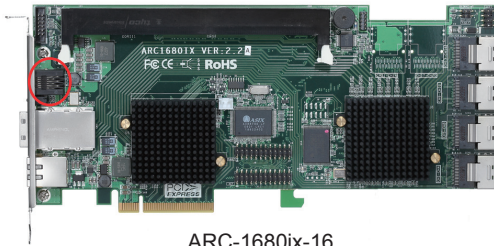
# SAS RAID Expander-CLI

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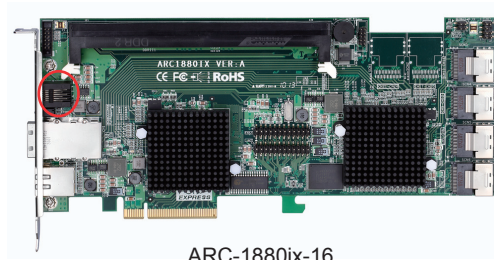
## 1. Introduction

This Command Line Interface (CLI) is provided for you to configure the Areca SAS RAID controller expander functions. The CLI is useful in environments where a graphical user interface (GUI) is not available.

- **Locations of RS-232 Port**



ARC-1680ix-16



ARC-1880ix-16

- **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 RAID controller's bracket can be used in VT100 mode. The provided interface cable converts the RS232 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.

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## 1.1 Expander RS-232C Port Pin Assignment

To ensure proper communications between the SAS RAID controller expander 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

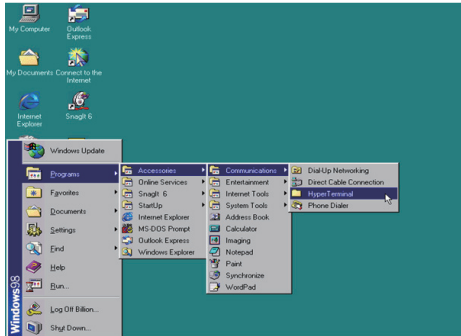
## 1.2 Start-up VT100 Screen

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.

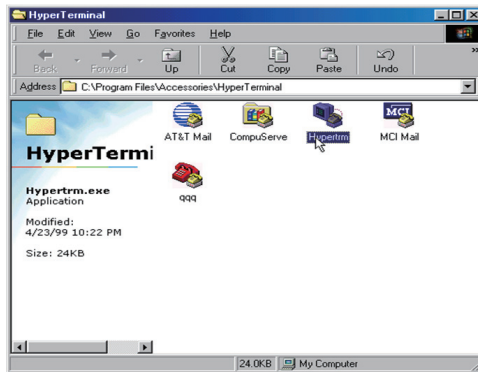
There are a wide variety of Terminal Emulation packages, but for the most part they should be very similar. The following setup procedure is an example Setup VT100 Terminal in Windows XP system using Hyper Terminal use Version 3.0 or higher.

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

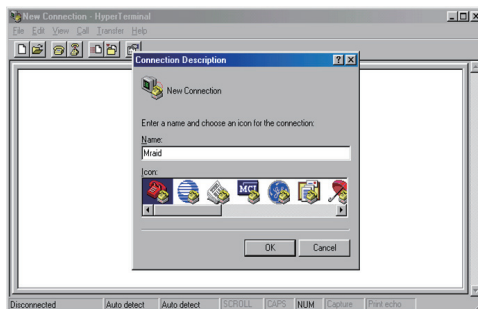
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**Step 2.** Open "HYPERTRM.EXE".

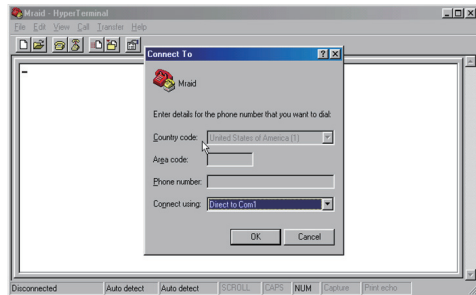


**Step 3.** Enter a name you prefer and then click "OK".



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**Step 4.** Select an appropriate connecting port and then click "OK".



**Step 5.** Configure the port parameter settings and then click "OK".

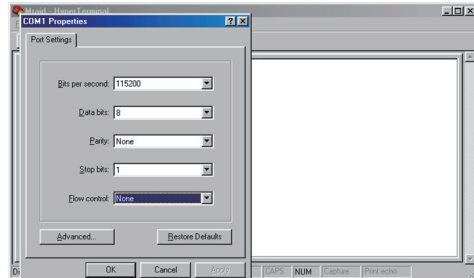
Bits per second: 115200

Data bits: 8

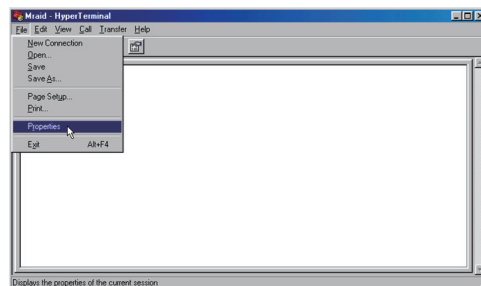
Parity: None

Stop bits: 1

Flow control: None

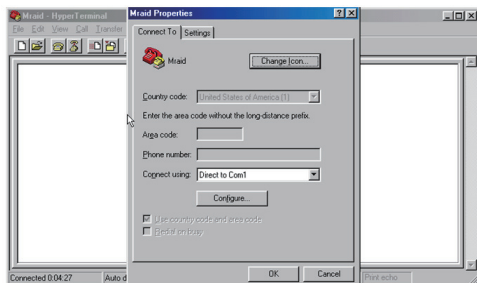


**Step 6.** Open the file menu and select "Properties".

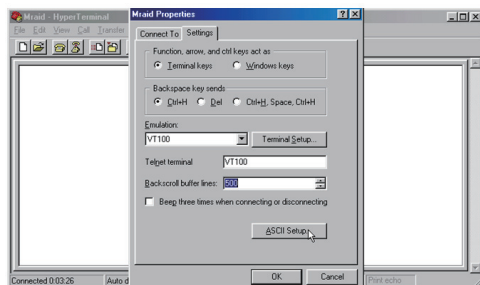


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**Step 7.** Configure the "Connect To" setting.



**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



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.



## 2. CLI Command

This section provides detail information about the SAS RAID controller expander's CLI function.

### ● **HELP Command**

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

#### **Syntax**

CLI>HE or HELP [Enter]

Example:

CLI>help

CLI Commands:

ER - Erase block Region  
FL - Update Flash Region  
ST - Store System Configurations in Flash  
PA - Set Password  
PL - Print System Log.  
SY - Print System Information  
SP - Operate the HDD SpinUp Attribute  
LI - Operate the Device Link Rate  
DR - Set the PHY Driven Strength  
LO - Logout CLI shell  
HE - Show All CLI commands and its usage

All numeric arguments must in HEX format, eg: 0x1028A, 0x8

### ● **ER Command**

Flash memory is a popular form of non-volatile memory. An entire block of flash can be erased with a single command. Erase the Code area before you update the firmware. There are two area that you can erase expander microcode on SAS RAID controller.

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- (1).FW file (CODE) : romXXXXXX.bin
- (2).Data file (DAT2) : mfgghbaYYYYYY.rom

## **Syntax**

CLI> ER {CODE | DATA2 } [Enter]

Example:

CLI>ER CODE

Erase Flash Region ...OK

## ● **FI Command**

The controller has added the expander firmware update through the CLI on the external RS-232 port. Before you process the firmware update, use the ER command to erase program block region. There are two block regions that you can update expander microcode on SAS RAID/Host adapter.

- (1).FW file (CODE) : romXXXXXX.bin
- (2).Data file (DAT2) : mfgghbaYYYYYY.rom

To update the expander controller firmware, follow the procedure below:

## **Syntax**

CLI>FL { CODE | DAT2 } [Enter]

Then use XModem/1K 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. 2 commands for update firmware, erase & flash. Step as follow,
- E. First issue "erase code" under "CLI>" prompt.  
CLI>er code

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- F. After success, issue "flash code" under "CLI>".  
CLI>fl code  
Wait to Receive File ...C <-----expander prompt for ready  
receive file to program.
- G. Then under HyperTerminal program, use the pull down menu  
item transfer "Send" -> send files when dialog box prompt,  
choose "Xmodem 1K" and the file in the directory then press  
"send".
- (1). If under the expander receive to file under the timeout  
limit (30s), the program starts.
- (2). If time out, please retry the step F again.
- H. You can also cancel the program step by type 3 time ctrl-X.
- I. If program OK, cold-start expander again.( or Power Off-On)

Example:

Update procedure, use Xmodem/1K to transfer, refer to ER and FL  
command for detail operation.

```
CLI> ER { CODE | DAT2 }
```

```
CLI> FL { CODE | DAT2 }
```

The following firmware and data are available in the form of DOS  
file.

CODE means the FW file : romXXXXXX.bin

DAT2 means the data file : mfgghbaYYYYY.rom

Update SAS RAID controller expander firmware:

```
CLI> ER CODE
```

```
CLI> FL CODE
```

Use HyperTerminal or TeraTerm utility with Xmodem/1K mode to  
transfer romXXXXXX.bin.

Update SAS RAID controller data file:

```
CLI>ER DAT2
```

```
CLI>FL DAT2
```

Use HyperTerminal or TeraTerm utility with Xmodem/1K mode to  
transfer mfgghbaYYYYY.rom.

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## ● ST Command

ST command stores system configurations in flash. The 0xFF means store all element data 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 0xFF [Enter]
```

Example:

```
CLI>ST 0xFF
```

```
CLI>
```

## ● PA Command

The PA command allows user to set or clear the expander controller password protection feature. Once the password has been set, the user can only monitor and access the expander controller 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>PA [Enter]
```

Example:

```
CLI>PA
```

```
Old Password:****
```

```
New Password:****
```

```
Verify New Password:****
```

```
Password Changed But Not Save Permanently!
```

```
Note, use CLI command "ST 0xFF" to keep permanently.
```

## ● PL Command

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

### Syntax

```
CLI>PL [Enter]
```

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Example:

CLI>PL

0: 0: 0>POST: System Boot Up!

0: 0: 0>POST: Enter the Main Loop ...

0: 2:50>UART: Password Is Changed!

0: 0: 0>POST: System Boot Up!

0: 0: 0>POST: Enter the Main Loop ...

0: 3:10>OK : Save Config !

0: 0: 0>POST: System Boot Up!

0: 0: 0>POST: Enter the Main Loop ...

0: 0:10>UART: Password Is Changed!

## ● SY Command

SY command is used to view the SAS expander's information. Typical information includes: vendor, model name, serial/unit number, expander port number/chip revision/firmware version, CFG data file and work time.

### Syntax

CLI>SY [Enter]

Example:

CLI>SY

Vender : Areca Technology Co Ltd. Taiwan, R.O.C

Model : ARC-8011

Serial No. : 0000000000000000

Unit Serial:

SAS address: 0x5001B4DFFFFFFF03F

Customer : 0x91

Port Num. : 28

Chip Rev. : A01

Firmware : 05.10.A123 03/18/08

CFG Data : 0x05

Work Time : 0: 2:45

### **Note:**

The model name of ARC-1680 is 8011 and ARC-1880 is 8018.

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## • SP Command

SP command defines the mode of staggering drive spin-up function connected on the expander controller. The "H" and "S" parameter gives the host and 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> SP [I|H|S [Delay Num] [Drive Num]] [Enter]

I - Power up to spin up all drives simultaneously mode.

H - Host/RAID controller notify mode.

S - Expander issues the spin up the drives by [Delay Num] [Delay Num] parameter.

Example1:

CLI>SP S 0X40 0X2

CLI>SP

SpinUp Attribute: (1tc= 16ms)

Mode = SelfTimed, Delay = 0x0040tc(4x16x16ms=1s), Drive Num = 0x02(2Disks per step)

Example2:

CLI>SP I

OK:Pls. Save Config. & Reboot To Take Effect

CLI>SP

SpinUp Attribute: (1tc= 16ms)

Mode = Immediate

Example3:

CLI>SP H

SpinUp Attribute: (1tc= 16ms)

Mode = Host-Notify

## • LI Command

The LI command allows you to set the operate device link rate that has been connected on expander controllers. Typical param-

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eters include: Max and Min disk speed connected the SAS expander controller.

## Syntax

CLI>LINK [Index Max Min] [Enter]

Index: Slot Index

Max, Min: speed code, 0x8 means 1.5G, 0x9 means 3.0G and A means 6G

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

CLI>ST 0xFF

Example:

CLI>LI

Device Link Attribute: 8=1.5G, 9=3.0G

=====PHY=====SPEED=MAX=MIN=====

0x00	0x08	NA	9	8	NA	SLOT 01
0x01	0x09	NA	9	8	NA	SLOT 02
0x02	0x0A	3.0G	9	8	SATA	SLOT 03
0x03	0x0B	NA	9	8	NA	SLOT 04
0x04	0x0C	NA	9	8	NA	SLOT 05
0x05	0x0D	NA	9	8	NA	SLOT 06
0x06	0x0E	NA	9	8	NA	SLOT 07
0x07	0x0F	NA	9	8	NA	SLOT 08
0x08	0x10	NA	9	8	NA	SLOT 09
0x09	0x11	NA	9	8	NA	SLOT 10
0x0A	0x12	NA	9	8	NA	SLOT 11
0x0B	0x13	NA	9	8	NA	SLOT 12

//Set the slot 0x2 max. speed to 1.5G

CLI>LI 0x2 0x8 0x8

OK:Pls. Save Config. & Reboot To Take Effect

CLI>LI

Device Link Attribute: 8=1.5G, 9=3.0G

=====PHY=====SPEED=MAX=MIN=====

0x00	0x08	NA	9	8	NA	SLOT 01
0x01	0x09	NA	9	8	NA	SLOT 02
0x02	0x0A	1.5G	8	8	SATA	SLOT 03 <----- max 1.5G
0x03	0x0B	NA	9	8	NA	SLOT 04

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0x04	0x0C	NA	9	8	NA	SLOT 05
0x05	0x0D	NA	9	8	NA	SLOT 06
0x06	0x0E	NA	9	8	NA	SLOT 07
0x07	0x0F	NA	9	8	NA	SLOT 08
0x08	0x10	NA	9	8	NA	SLOT 09
0x09	0x11	NA	9	8	NA	SLOT 10
0x0A	0x12	NA	9	8	NA	SLOT 11
0x0B	0x13	NA	9	8	NA	SLOT 12

CLI>ST 0xFF

Reboot to take effect.

## ● DR Command

The DR command allows you to adjust the PHY driver strength that can meet different SAS cable length.

### Syntax

CLI> DR [-[C|O] 0x{1..6}] [Enter]

C: For internal cable driver strength (device port) setting.

O: For external cable driver strength (external port) setting.

{1..6} : For cable length 1 to 6m.

Example:

CLI>DR [Enter]

SAS Cable Signal Level:

Device Port Level : 1m

External Port Level : 1m

CLI>DR -C 0x5 [Enter]

OK:Pls. Save Config. & Reboot To Take Effect

CLI>DR [Enter]

SAS Cable Signal Level:

Device Port Level : 5m

External Port Level : 1m

CLI>DR -O 0x3 [Enter]

OK:Pls. Save Config. & Reboot To Take Effect

CLI>DR

SAS Cable Signal Level:



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Device Port Level : 5m  
External Port Level : 3m  
CLI>ST 0xFF [Enter]  
Reboot to take effect.  
CLI>

## ● LO Command

To close the currently selected expander controller and exit the CLI, use the exit LO command.

### **Syntax**

CLI> LO [Enter]

Example:

CLI>LO

Password: