

# **SAS RAID Expander-CLI**

**ARC-1883ix-12/16/24** (12Gb/s SAS RAID Controller)

## **USER Guide**

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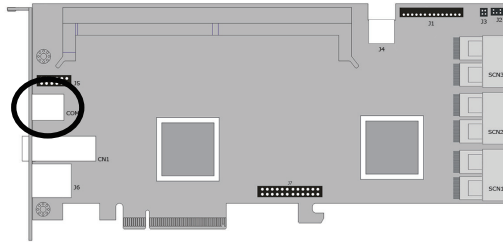
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## 1. Introduction

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-1883ix-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.

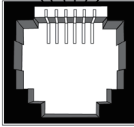
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## 1.1 Expander RS-232C Port Pin Assignment

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.

Pin Assignment				
Pin	Definition	Pin	Definition	
1	RTS (RS232)	4	GND	
2	RXD (RS232)	5	GND	
3	TXD (RS232)	6	GND	

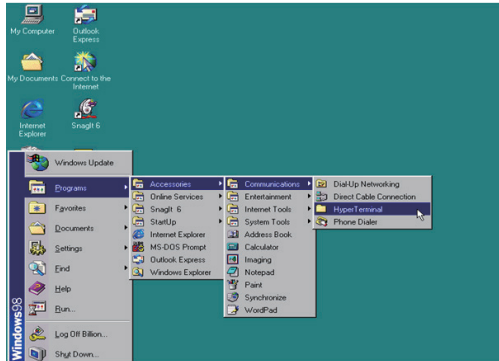
## 1.2 Start-up VT100 Screen

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.

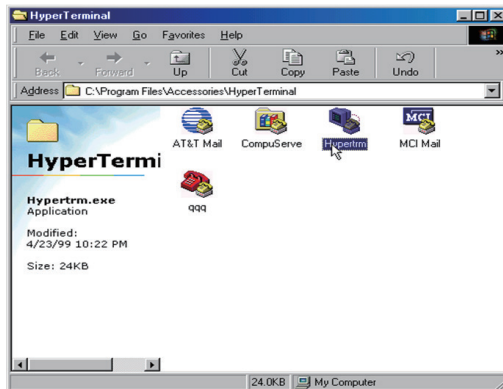
There are a wide variety of Terminal Emulation packages, but for the most part they should be very similar. The following setup procedure is an example Setup VT100 Terminal in Windows XP system using Hyper Terminal use Version 3.0 or higher.

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

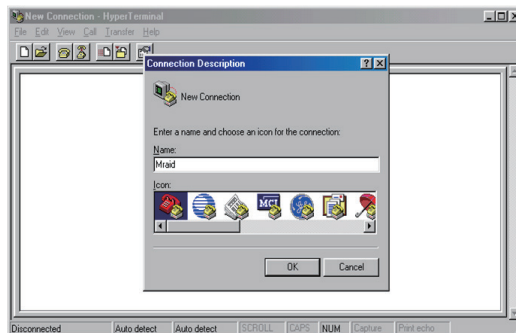
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**Step 2.** Open "HYPERTRM.EXE".

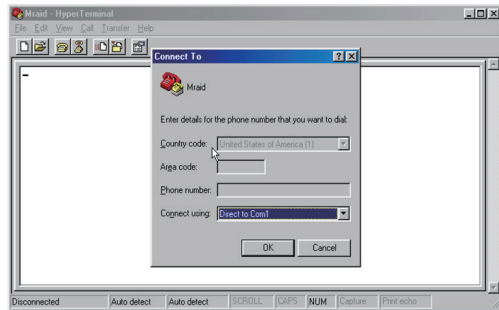


**Step 3.** Enter a name you prefer and then click "OK".



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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".

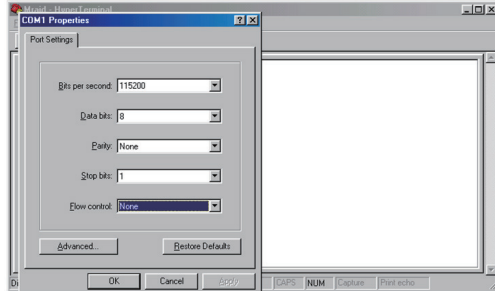
Bits per second: 115200

Data bits: 8

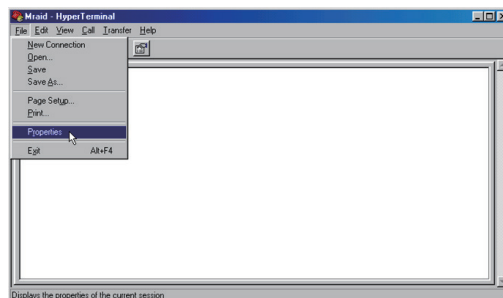
Parity: None

Stop bits: 1

Flow control: None

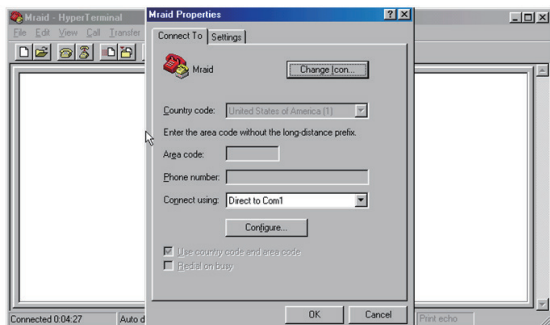


**Step 6.** Open the file menu and select "Properties".

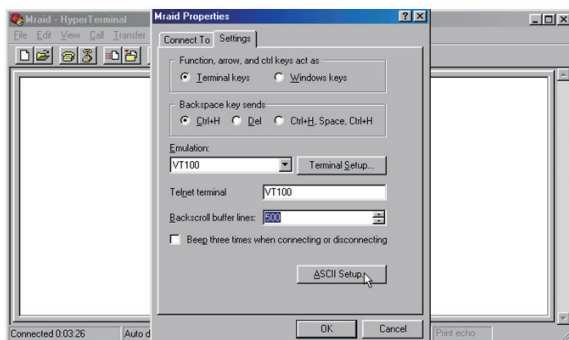


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**Step 7.** Configure the "Connect To" setting.



**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

### ● 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
dhpm	- Bandwidth Optimizer
sys	- System Information
spin	- Drive SpinUp Control
st	- Store System Setting
lsd	- List Devices Status
showlogs	- Show the Current Logs
fld	- File Download
counters reset	- Display/Reset all phy counters
sasaddr	- Display expander SAS address

### ● PASS Command

The pass command allows user to set or clear the expander box password protection feature. Once the password has been set, the user can only monitor and access the expander box 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]

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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 expander box 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 expander controllers. Typical parameters include: Max and Min disk speed connected the SAS expander box.

### Syntax

CLI>link [Index Max Min] [Enter]  
Index: Slot Index  
Max, Min: speed code, 8 means 1.5G, 9 means 3.0G, 10 means 6.0G, and 11 means 12.0G  
PS. Pls. Save Config. & Reboot To Take Effect  
CLI>st

Example:  
CLI>link  
ArrayDevice Element (0x17):

=====							
NAME	PHY	ORG	NLR	MAX	MIN	TYPE	ADDRESS
SLOT 01	13	6G	6G	11	8	SATA	5001B469-189AE00D

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SLOT 02	12	6G	6G	11	8	SAS	5011B469-189AE00C
SLOT 03	14	6G	6G	11	8	SATA	5011B469-189AE00E
SLOT 04	15	6G	6G	11	8	SATA	5011B469-189AE00F
SLOT 05	9	6G	6G	11	8	SATA	5011B469-189AE009
SLOT 06	8	6G	<b>6G</b>	<b>11</b>	8	SATA	5011B469-189AE008
SLOT 07	10	6G	6G	11	8	SATA	5011B469-189AE00A
SLOT 08	11	6G	6G	11	8	SATA	5011B469-189AE00B
SLOT 09	5	6G	6G	11	8	SATA	5011B469-189AE005
SLOT 10	4	6G	6G	11	8	SATA	5011B469-189AE004
SLOT 11	6	3G	3G	11	8	SAS	500000E0-168F8E92
SLOT 12	7	3G	3G	11	8	SAS	500000E0-168F8E99

//Set the slot 0x6 max. speed to 3.0G

CLI >link 6 9 8

CLI>st

CLI>

Reboot to take effect.

CLI >link

ArrayDevice Element (0x17):

=====							
NAME	PHY	ORG	NLR	MAX	MIN	TYPE	ADDRESS
SLOT 01	13	6G	6G	11	8	SATA	5001B469-189AE00D
SLOT 02	12	6G	6G	11	8	SAS	5011B469-189AE00C
SLOT 03	14	6G	6G	11	8	SATA	5011B469-189AE00E
SLOT 04	15	6G	6G	11	8	SATA	5011B469-189AE00F
SLOT 05	9	6G	6G	11	8	SATA	5011B469-189AE009
SLOT 06	8	6G	<b>3G</b>	<b>9</b>	8	SATA	5011B469-189AE008
SLOT 07	10	6G	6G	11	8	SATA	5011B469-189AE00A
SLOT 08	11	6G	6G	11	8	SATA	5011B469-189AE00B
SLOT 09	5	6G	6G	11	8	SATA	5011B469-189AE005
SLOT 10	4	6G	6G	11	8	SATA	5011B469-189AE004
SLOT 11	6	3G	3G	11	8	SAS	500000E0-168F8E92
SLOT 12	7	3G	3G	11	8	SAS	500000E0-168F8E99

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## ● DHPM Command

Use for 3G/6G SAS/SATA drive speed up as 12G drive performance. DataBolt™ Bandwidth Optimizer is designed to help facilitate the industry transition to 12Gb/s SAS-enabled systems by allowing users to take advantage of 12Gb/s speeds while utilizing existing 6Gb/s drives or backplanes.

### Syntax

CLI> dhpm [on | off] [i,j,..] [Enter]  
on - turn on all drive slot as 12G performance mode.  
off - turn off all drive slot 12G performance mode.  
i,j,.. - turn on/off drive slot i,j, ...12G performance mode.

Example:

CLI>help dhpm  
Drive High Performance                      dhpm { [on | off] [i,j,..] }

CLI>link  
ArrayDevice Element (0x17):

=====							
NAME	PHY	ORG	NLR	MAX	MIN	TYPE	ADDRESS
SLOT 01	13	6G	6G	11	8	SATA	5001B469-189AE00D
SLOT 02	12	6G	<b>6G</b>	11	8	SAS	5011B469-189AE00C
SLOT 03	14	6G	6G	11	8	SATA	5011B469-189AE00E
SLOT 04	15	6G	6G	11	8	SATA	5011B469-189AE00F
SLOT 05	9	6G	6G	11	8	SATA	5011B469-189AE009
SLOT 06	8	6G	6G	11	8	SATA	5011B469-189AE008
SLOT 07	10	6G	6G	11	8	SATA	5011B469-189AE00A
SLOT 08	11	6G	6G	11	8	SATA	5011B469-189AE00B
SLOT 09	5	6G	6G	11	8	SATA	5011B469-189AE005
SLOT 10	4	6G	6G	11	8	SATA	5011B469-189AE004
SLOT 11	6	3G	3G	11	8	SAS	500000E0-168F8E92
SLOT 12	7	3G	<b>3G</b>	11	8	SAS	500000E0-168F8E99

CLI>dhpm on 2,12                                      ;;;; set drive slot 2,12 on

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```
CLI>st
Reset or PowerCycle
```

```
CLI>link
ArrayDevice Element (0x17):
```

```
=====
```

NAME	PHY	ORG	NLR	MAX	MIN	TYPE	ADDRESS
SLOT 01	13	6G	6G	11	8	SATA	5001B469-189AE00D
SLOT 02	12	6G	<b>12G</b>	11	8	SAS	5011B469-189AE00C
SLOT 03	14	6G	6G	11	8	SATA	5011B469-189AE00E
SLOT 04	15	6G	6G	11	8	SATA	5011B469-189AE00F
SLOT 05	9	6G	6G	11	8	SATA	5011B469-189AE009
SLOT 06	8	6G	6G	11	8	SATA	5011B469-189AE008
SLOT 07	10	6G	6G	11	8	SATA	5011B469-189AE00A
SLOT 08	11	6G	6G	11	8	SATA	5011B469-189AE00B
SLOT 09	5	6G	6G	11	8	SATA	5011B469-189AE005
SLOT 10	4	6G	6G	11	8	SATA	5011B469-189AE004
SLOT 11	6	3G	3G	11	8	SAS	500000E0-168F8E92
SLOT 12	7	3G	<b>12G</b>	11	8	SAS	500000E0-168F8E99

```
CLI>dhpm on                ;;;; set all drives on
CLI>st
Reset or PowerCycle
```

```
.....
```

## ● SYS Command

The sys command is used to view the expander'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.

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---

## Syntax

CLI>sys [Enter]

Example:

CLI>sys

=====

Hardware Revision Information:-

=====

Vendor ID	: Areca Technology Co Ltd. Taiwan, R.O.C
Model ID	: ARC-8028
Serial No.	: 000000000000000000
Unit Serial No.	:
Expander SAS Address	: 0x5001B469189AE03F
Product Revision	: 0
Expander Chip ID	: 0x0233 (Ports : 36)
Expander Chip Revision	: C0
Customer Code	: 0x35 (R01)
Manufacturer Data Revision	: 0x01 12/12/13
Working Time	: Day00000-00:00:06
Dual Mode	: Single

=====

Firmware Revision Information:-

=====

Boot Image:

Revision: 100.BD.00.0A 12/05/13  
Firmware Family: 0 OemFamily: 0  
Fast Boot: Yes Image Address: 0x10000000

Firmware Copy 1:

Revision: 100.BD.01.0A 01/06/14  
Firmware Family: 0 OemFamily: 0  
Fast Boot: Yes Image Address: 0x10100000

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---

Firmware Copy 2: [Active]

Revision: 100.BD.01.0A 01/06/14

Firmware Family: 0 OemFamily: 0

Fast Boot: Yes Image Address: 0x10200000

HAL Revision: 0.1.0.0 SES Revision: 0.1.0.0 SCE Revision:  
0.1.0.0

## ● SPIN Command

The spin command defines the mode of staggering SATA drive spin-up function connected on the expander box. This command gives expander box 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

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---

## ● 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 use for show the element devices status in the expander controller. With parameter, this command only show the seletct 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	5001B469-84965C03	
SLOT 05	4		10	8			
SLOT 06	5		10	8			
SLOT 07	6	6.0G	10	8	SAS	5000C500-17C8FD25	
SLOT 08	7		10	8			
SLOT 09	8		10	8			
SLOT 10	9		10	8			
SLOT 11	10		10	8			
SLOT 12	11		10	8			



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Connector Element (0x19):

=====				
NAME	PHY	NLR	TYPE	STATUS
Connector00	16		02	
Connector00	17		02	
Connector00	18		02	
Connector00	19		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	24		02	
Connector02	25		02	
Connector02	26		02	
Connector02	27		02	

Cooling Element (0x03):

=====			
SPEED			
NAME	CODE	RPM	STATUS
Fan 01	5	2100	OK
Fan 02	5	2200	OK
Fan 03	Not-Installed		
Fan 04	Not-Installed		

Temperature Element (0x04):

=====					
NAME	ID	CT(°C)	HTW	LTW	OTWarn
ENC. Temp	01	32	60	5	No
Chip Temp	02	42	85	0	No

Voltage Element (0x12):

=====				
NAME	VOLT(V)	OVLMT	UVLMT	STATUS
1V	0.99	1.07	0.94	None
5V	4.96	5.32	4.63	None

PowerSupply Element (0x02):

=====	
NAME	STATUS
PowerSupply01	OK
PowerSupply02	OK

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---

AudibleAlarm Element (0x06):

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

## ● 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 box has added the expander 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 expander microcode on SAS expander box.

1. CODE region - for FW file : sas3xfwYYMMDD.fw
2. MFGB region - for Data file : mfg12gYYMMDD.dat

To update the expander controller 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:

1. Open any UART communication tools like HypeTerminal ( 115200, n, 8, 1).

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2. Press any key on HyperTerminal window, the window will show "CLI>" prompt.
3. Type help will show help screen.
4. One command to update firmware. Step as follow.
5. 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.  
<-----expander prompt for ready to receive file to update.
6. Then under HyperTerminal program, use the pull down menu item transfer "Send" -> send files when dialog box prompt, choose "Xmodem" and the file in the directory then press "send".
  - (a). If the expander receive the file under the timeout limit (60s), the process starts.
  - (b). If time out, please retry the step E again.
7. You can also cancel the program step by type 'q'.
8. If transfer OK, the transfered data is updated. Cold-start expander (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 transfered data is updated. Cold-start expander (Power cycle again) to take effect.

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

1. FW file (CODE) : sas3xfwYYMMDD.fw
2. Data file (MFGB) : mfg12gYYMMDD.dat

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---

Update SAS expander firmware:

```
CLI> fdl code 0
```

Use HyperTerminal or TeraTerm utility with Xmodem mode to transfer sas3xfwYYMMDD.fw.

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

Update SAS expander data file:

```
CLI>fdl mfgb 0
```

Use HyperTerminal or TeraTerm utility with Xmodem mode to transfer mfg12gYYMMDD.dat.

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

## ● Counters Reset Command

Display/Reset all phy counters counters reset (optional).

```
CLI>counters reset
```

Phy counters successfully reset.

```
CLI>counters
```

Phy Layer Error Counters=====

== InvWrdCnt ==DispErrCnt ==LossSyncCnt ==RstSeqFailCnt==

Phy 00	0x00000000	0x00000000	0x00000000	0x00000000
Phy 01	0x00000000	0x00000000	0x00000000	0x00000000
Phy 02	0x00000000	0x00000000	0x00000000	0x00000000
Phy 03	0x00000000	0x00000000	0x00000000	0x00000000
Phy 04	0x00000000	0x00000000	0x00000000	0x00000000
Phy 05	0x00000000	0x00000000	0x00000000	0x00000000
Phy 06	0x00000000	0x00000000	0x00000000	0x00000000
Phy 07	0x00000000	0x00000000	0x00000000	0x00000000
Phy 08	0x00000000	0x00000000	0x00000000	0x00000000
Phy 09	0x00000000	0x00000000	0x00000000	0x00000000
Phy 10	0x00000000	0x00000000	0x00000000	0x00000000
Phy 11	0x00000000	0x00000000	0x00000000	0x00000000
Phy 12	0x00000000	0x00000000	0x00000000	0x00000000
Phy 13	0x00000000	0x00000000	0x00000000	0x00000000
Phy 14	0x00000000	0x00000000	0x00000000	0x00000000
Phy 15	0x00000000	0x00000000	0x00000000	0x00000000
Phy 16	0x00000000	0x00000000	0x00000000	0x00000000

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---

Phy 17	0x00000000	0x00000000	0x00000000	0x00000000
Phy 18	0x00000000	0x00000000	0x00000000	0x00000000
Phy 19	0x00000000	0x00000000	0x00000000	0x00000000
Phy 20	0x00000000	0x00000000	0x00000000	0x00000000
Phy 21	0x00000000	0x00000000	0x00000000	0x00000000
Phy 22	0x00000000	0x00000000	0x00000000	0x00000000
Phy 23	0x00000000	0x00000000	0x00000000	0x00000000
Phy 24	0x00000000	0x00000000	0x00000000	0x00000000
Phy 25	0x00000000	0x00000000	0x00000000	0x00000000
Phy 26	0x00000000	0x00000000	0x00000000	0x00000000
Phy 27	0x00000000	0x00000000	0x00000000	0x00000000

Link Layer Event Counters

Phy Event Counter Not Configured.

Generic Broadcast Counter

Broadcast Counter Not Configured.

Generic Broadcast Counter

Broadcast Counter Not Configured.

## ● Sasaddr Command

CLI>sasaddr

Expander New SAS Address: 0x5001B4690400083F

Expander Current SAS Address:

EXP Port SAS Address: 0x5001B4690400083F

SXP Port SAS Address: 0x5001B4690400083D

STP Port SAS Address: Disabled