



# RPC-693xx Series Setup Guide

---

P/N 83-00004641-12-02  
Revision A  
November 2011

Copyright Protected Material 2011. The material in this document is for information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, changes in the product design can be made without reservation and without notification to its users.



Adobe PostScript

# Contents

---

<b>Preface</b> .....	<b>11</b>
Intended audience .....	11
Prerequisites.....	11
Related documentation .....	11
Document conventions and symbols.....	12
<b>1 Components</b> .....	<b>13</b>
12-drive enclosure front panel components .....	13
12-drive enclosure disk drive slot numbers .....	13
Rear panel views — controller module(s).....	13
693x6 controller module face plate — hybrid (FC/iSCSI).....	13
693x1 controller module face plate — Fibre Channel.....	14
693x4 controller module face plate — Serial Attached SCSI.....	14
693x5 controller module face plate — 10GbE Internet SCSI.....	14
693x6 controller enclosure rear panel components.....	15
693x1 controller enclosure rear panel components.....	16
693x4 controller enclosure rear panel components.....	16
693x5 controller enclosure rear panel components.....	17
693x2 enclosure rear panel components.....	17
695x2/697x2 12-drive enclosure rear panel components .....	17
Cache .....	18
CompactFlash .....	18
Super-capacitor pack.....	18
<b>2 Installing the enclosures</b> .....	<b>19</b>
Installation checklist.....	19
Connecting controller and drive enclosures.....	19
Cable requirements for drive enclosures .....	20
Testing enclosure connections.....	27
Powering on/powering off .....	27
AC PSU.....	28
DC and AC PSUs with power switch .....	29
Power Cords .....	29
AC model .....	29
DC model.....	29
Power cycle .....	30
<b>3 Connecting hosts</b> .....	<b>31</b>
Host system requirements .....	31
Cabling considerations.....	31
Connecting the enclosure to hosts .....	31
FC host ports .....	32
SAS host ports .....	32
iSCSI host ports (1Gb) .....	32
iSCSI host ports (10GbE) .....	32
Connecting direct attach configurations.....	32
Single-controller configurations.....	34
One server/one HBA/single path .....	34
Dual-controller configurations .....	35
One server/one HBA/dual path .....	35
Two servers/one HBA per server/dual path.....	36
Four servers/one HBA per server/dual path.....	36
Connecting switch attach configurations .....	37
Multiple servers/multiple switches .....	37
Connecting a management host on the network.....	38
Connecting two storage systems to replicate volumes .....	38
Single-controller configuration .....	40

One server/one switch/two storage systems . . . . .	40
Dual-controller configuration . . . . .	41
Two servers/one switch/two storage systems . . . . .	41
Multiple servers/SAN fabric/Ethernet WAN/two storage systems . . . . .	42
Multiple servers/FC SAN fabric/two storage systems . . . . .	43
Updating firmware . . . . .	43
Obtaining IP values . . . . .	43
Setting network port IP addresses using DHCP . . . . .	43
Setting network port IP addresses using the CLI . . . . .	44
<b>4 Basic operation . . . . .</b>	<b>47</b>
Accessing RAIDar . . . . .	47
Configuring and provisioning the storage system . . . . .	47
<b>5 Troubleshooting . . . . .</b>	<b>49</b>
USB CLI port connection . . . . .	49
Fault isolation methodology . . . . .	49
Gather fault information. . . . .	49
Determine where the fault is occurring . . . . .	49
Review the event logs . . . . .	49
Isolate the fault . . . . .	50
If the enclosure does not initialize . . . . .	50
Correcting enclosure IDs. . . . .	50
Diagnostic steps . . . . .	50
Is the front panel Fault/Service Required LED amber? . . . . .	50
Is the controller back panel FRU OK LED off? . . . . .	51
Is the controller back panel Fault/Service Required LED amber? . . . . .	51
Are both disk drive module LEDs off? . . . . .	51
Is the disk drive module Power/Activity/Fault LED blinking amber? . . . . .	51
Is a connected host port's Host Link Status LED off? . . . . .	52
Is a connected port's Expansion Port Status LED off? . . . . .	52
Is a connected port's Network Port link status LED off? . . . . .	52
Is the power supply's Input Power Source LED off? . . . . .	53
Is the drive enclosure rear panel OK LED off? . . . . .	53
Is the drive enclosure Fault/Service Required LED amber? . . . . .	53
Controller failure in a single-controller configuration . . . . .	54
If the controller has failed or does not start, is the Cache Status LED on/blinking? . . . . .	54
Transporting cache via professional services . . . . .	55
Isolating a host-side connection fault. . . . .	55
Host-side connection troubleshooting featuring FC or 10GbE iSCSI host ports . . . . .	55
Host-side connection troubleshooting featuring SAS or iSCSI host ports . . . . .	56
Isolating a controller module expansion port connection fault. . . . .	57
Isolating AssuredRemote replication faults . . . . .	58
Cabling for replication . . . . .	58
Replication setup and verification . . . . .	58
Diagnostic steps for replication setup. . . . .	59
Can you access the AssuredRemote feature? . . . . .	59
Can you view information about remote links? . . . . .	59
Can you create a replication set, or select an existing one? . . . . .	59
Can you replicate a volume? . . . . .	60
Can you view a replication image? . . . . .	61
Can you view remote systems? . . . . .	61
Resolving voltage and temperature warnings. . . . .	61
Sensor locations . . . . .	62
Power supply sensors . . . . .	62
Cooling fan sensors. . . . .	62
Temperature sensors. . . . .	62
Power supply module voltage sensors . . . . .	63
<b>A LED descriptions . . . . .</b>	<b>65</b>
12-drive enclosure front panel LEDs . . . . .	65

Disk drive LEDs . . . . .	65
693x6 rear panel LEDs . . . . .	66
693x1 rear panel LEDs . . . . .	67
693x4 rear panel LEDs . . . . .	68
693x5 rear panel LEDs . . . . .	69
693x2 drive enclosure rear panel LEDs . . . . .	70
695x2/697x2 12-drive enclosure rear panel LEDs . . . . .	71
Power supply LEDs . . . . .	72
<b>B Environmental requirements and specifications. . . . .</b>	<b>73</b>
Safety requirements . . . . .	73
Site requirements and guidelines . . . . .	73
Site wiring and AC power requirements . . . . .	73
Site wiring and DC power requirements . . . . .	73
Weight and placement guidelines . . . . .	74
Electrical guidelines . . . . .	74
Ventilation requirements . . . . .	74
Cabling requirements . . . . .	75
Management host requirements . . . . .	75
Physical requirements . . . . .	75
Environmental requirements . . . . .	76
Electrical requirements . . . . .	76
Site wiring and power requirements . . . . .	76
Power cord requirements . . . . .	76
<b>C Electrostatic discharge . . . . .</b>	<b>79</b>
Preventing electrostatic discharge . . . . .	79
Grounding methods to prevent electrostatic discharge . . . . .	79
<b>D USB device connection . . . . .</b>	<b>81</b>
Rear panel USB ports . . . . .	81
USB CLI port . . . . .	81
Emulated serial port . . . . .	81
Supported host applications . . . . .	82
Command Line Interface . . . . .	82
Device driver/special operation mode . . . . .	82
Microsoft Windows . . . . .	82
Linux . . . . .	82
Setting parameters for the device driver . . . . .	82
<b>Index . . . . .</b>	<b>83</b>



# Figures

---

1	CompactFlash	18
2	Cabling connections between a single-controller enclosure and one drive enclosure	21
3	Cabling connections between a dual-controller enclosure and a single drive enclosure	22
4	Non-fault-tolerant cabling between a dual-controller enclosure and three LFF drive enclosures	22
5	Fault-tolerant cabling between a dual-controller enclosure and four LFF drive enclosures	23
6	Fault-tolerant cabling between a dual-controller enclosure and three drive enclosures	24
7	Fault-tolerant cabling between a dual-controller enclosure and four drive enclosures	25
8	Fault-tolerant cabling between a dual-controller enclosure and seven drive enclosures	26
9	AC PSU	28
10	AC power cord	28
11	DC and AC PSUs with power switch	29
12	DC power cable featuring D-shell and lug connectors	29
13	Connecting hosts – one server/one HBA/single path	34
14	Connecting hosts – one server/one HBA/dual path	35
15	Connecting hosts – two servers/one HBA per server/dual path	36
16	Connecting hosts – four servers/one HBA per server/dual path	37
17	Connecting hosts – switch attach: two servers/two switches	38
18	Connecting two storage systems for replication – single-controller module	40
19	Connecting two storage systems for replication – dual-controller module	41
20	Connecting two systems for AssuredRemote – 693x6 example	42
21	Connecting two systems for AssuredRemote – 693x1 example	43
22	Connecting an RS-232 cable to the CLI port	45
23	Connecting a USB cable to the CLI port	45
24	USB device connection – CLI port	81





# Tables

---

1	Document conventions	12
2	Installation checklist	19
3	SAS cable type requirements	21
4	Maximum cable lengths for 850nm Fibre Channel SFP transceivers	33
5	Terminal emulator display settings	45
6	Terminal emulator connection settings	45
7	Diagnostics LED status – Front panel Fault/Service Required	50
8	Diagnostics LED status – Rear panel FRU OK	51
9	Diagnostics LED status – Rear panel Fault/Service Required	51
10	Diagnostics LED status – Disk drives	51
11	Diagnostics LED status – Disk drive Power/Activity/Fault	51
12	Diagnostics LED status – Rear panel Host Link Status	52
13	Diagnostics LED status – Rear panel Expansion Port Status	52
14	Diagnostics LED status – Rear panel Network Port Link Status	52
15	Diagnostics LED status – Power supply Input Power Source	53
16	Diagnostics LED status – Drive enclosure rear panel OK	53
17	Diagnostics LED status – Drive enclosure front panel Fault/Service Required	53
18	Diagnostics LED status – Rear panel Cache Status	54
19	Diagnostics for replication setup – Accessing AssuredRemote feature	59
20	Diagnostics for replication setup – Viewing information about remote links	59
21	Diagnostics for replication setup – Creating or selecting a replication set	59
22	Diagnostics for replication setup – Replicating a volume	60
23	Diagnostics for replication setup – Viewing a replication image	61
24	Diagnostics for replication setup – Viewing a remote system	61
25	Power supply sensors	62
26	Cooling fan sensor descriptions	62
27	Controller module temperature sensors	63
28	Power supply temperature sensors	63
29	Voltage sensor descriptions	63
30	LEDs – 3U12 enclosure front panel	65
32	LEDs – 693x6 rear panel	66
33	LEDs – 693x1 rear panel	67
34	LEDs – 693x4 rear panel	68
35	LEDs – 693x5 rear panel	69
36	LEDs – 693x2 rear panel	70
37	LEDs – 695x2/697x2 rear panel	71
38	LEDs – power supply units – rear panel	72
39	Power requirements - AC Input	73
40	Power requirements - DC Input	73
41	Rackmount enclosure dimensions	76
42	Rackmount enclosure weights	76
43	Operating environmental specifications	76
44	Supported terminal emulator applications	82
45	USB vendor and product identification codes	82



# Preface

---

This guide provides information about the Phoenix™ RPC12 series storage management products:

Hybrid FC/iSCSI Controller Enclosure:

- 693x6

Fibre Channel Controller Enclosure:

- 693x1

Serial Attached SCSI Controller Enclosure:


- 693x4

Internet SCSI (10GbE) Controller Enclosure:

- 693x5

RPC12 series enclosures are MIL-STD-compliant — supporting large form factor (LFF 12-disk) 3U drive enclosures — using either AC or DC power supplies.

---

 **NOTE:** See [Components](#) on page 13 for details regarding enclosure components.

---

## Intended audience

This guide is intended for use by system administrators and technicians who are experienced with the following:

- Direct attach storage (DAS) or storage area network (SAN) management
- Network administration
- Network installation
- Storage system installation and configuration

## Prerequisites

Prerequisites for installing and configuring this product include familiarity with:

- Servers and computer networks
- Fibre Channel (FC), Serial Attached SCSI (SAS), Internet SCSI (iSCSI), and Ethernet protocols

## Related documentation

In addition to this guide, please refer to other documents for this product line:


- Phoenix RPC12 series RAIDar User Guide
- Phoenix RPC12 series CLI Reference Guide
- Phoenix Event Descriptions Reference Guide

# Document conventions and symbols

**Table 1** Document conventions


Convention	Element
<a href="#">Navy blue text</a>	Cross-reference links and e-mail addresses
<code>Navy blue text</code>	Web site addresses
<b>Bold font</b>	<ul style="list-style-type: none"><li>• Key names</li><li>• Text typed into a GUI element, such as into a box</li><li>• GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes</li></ul>
<i>Italics font</i>	Text emphasis
Monospace font	<ul style="list-style-type: none"><li>• File and directory names</li><li>• System output</li><li>• Code</li><li>• Text typed at the command-line</li></ul>
<i>Monospace, italic font</i>	<ul style="list-style-type: none"><li>• Code variables</li><li>• Command-line variables</li></ul>
<b>Monospace, bold font</b>	Emphasis of file and directory names, system output, code, and text typed at the command line

---

 **WARNING!** Indicates that failure to follow directions could result in bodily harm or death.


---

---

 **CAUTION:** Indicates that failure to follow directions could result in damage to equipment or data.


---

---

 **IMPORTANT:** Provides clarifying information or specific instructions.

---

---

 **NOTE:** Provides additional information.

---

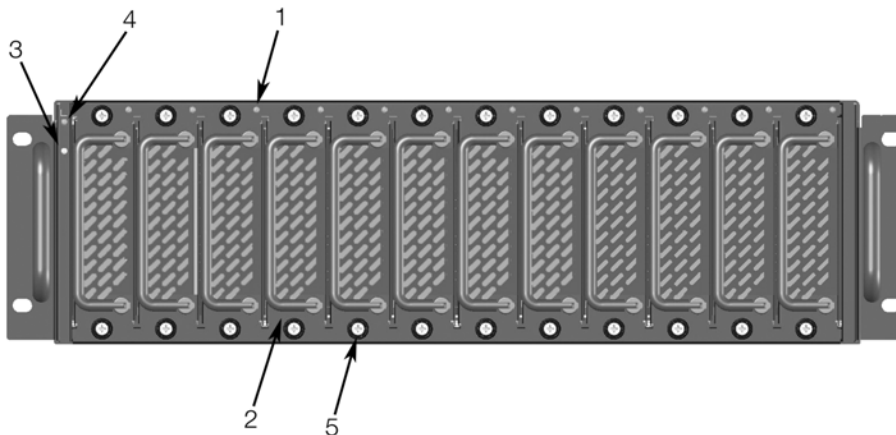
---

 **TIP:** Provides helpful hints and shortcuts.

---

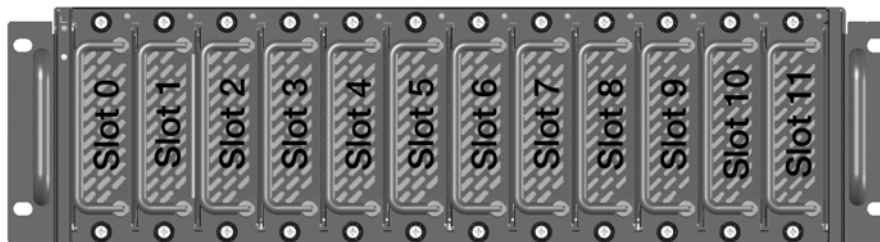
# 1 Components

## 12-drive enclosure front panel components



- 1 Disk drive status LED: Power/Activity/Fault
- 2 3.5" disk or drive blank (typical 12 slots)
- 3 Enclosure status LED: Fault/Service Required
- 4 Enclosure status LED: Power Indicator
- 5 Disk drive lock/thumb-screw

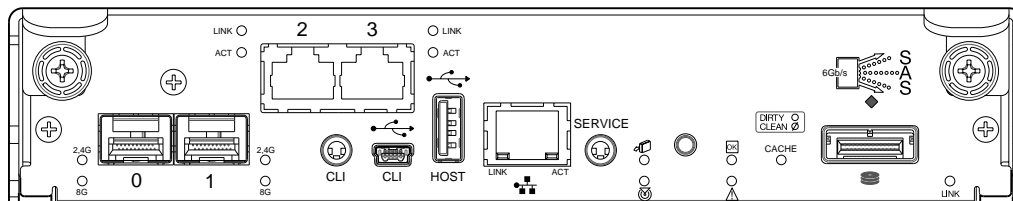
## 12-drive enclosure disk drive slot numbers



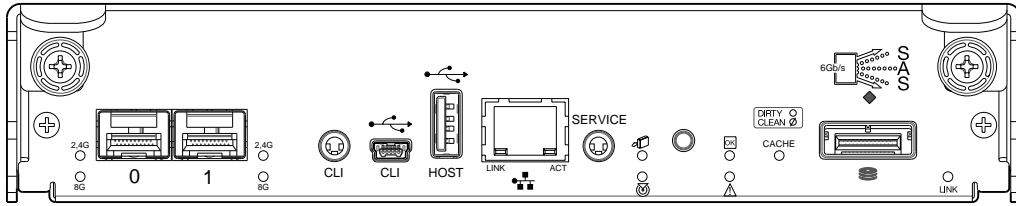
## Rear panel views — controller module(s)

The Phoenix RPC12 series controller module(s) shown below are not proportionately sized relative to preceding controller enclosure views. Controller module face plates are enlarged to show relevant detail.

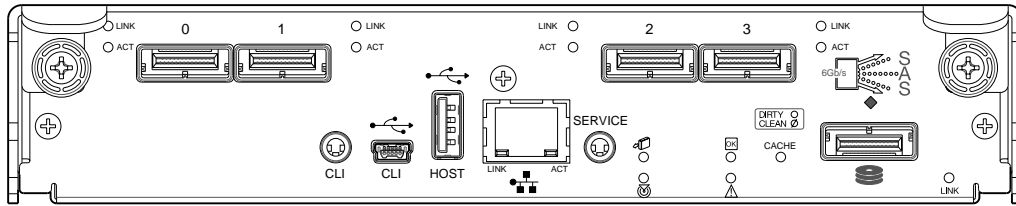
### 693x6 controller module face plate — hybrid (FC/iSCSI)



## 693x1 controller module face plate — Fibre Channel



## 693x4 controller module face plate — Serial Attached SCSI



## 693x5 controller module face plate — 10GbE Internet SCSI

