



iR16SAEJ

**SAS to SAS
JBOD**

User Manual

Version 1.1 (Feb, 2010)

Limited Warranty

iStoragePro WARRANTS TO THE ORIGINAL PURCHASER THAT ITS EXTERNAL ENCLOSURE PRODUCTS INCLUDING THE COMPONENTS THEREIN, SHALL BE FREE FROM DEFECTS IN MATERIAL AND CRAFTSMANSHIP FOR A LIMITED PERIOD OF THREE (3) YEARS. SHOULD iStoragePro BUNDLE, OFFER, COMBINE OR DISTRIBUTE ANY THIRD PARTY'S HARDWARE, PRODUCTS, COMPONENTS, THE WARRANTY OFFERED BY SUCH MANUFACTURERS OR SUPPLIERS MUST APPLY. ANY SOFTWARE INSTALLED, DISTRIBUTED, OR SOLD BY Ci DESIGN IS NOT COVERED BY iStoragePro's LIMITED WARRANTY AND MUST ONLY REFER TO THE LICENSING AGREEMENT ACCOMPANYING TO THE SOFTWARE FOR THE TERMS AND CONDITIONS OF USING SUCH SOFTWARE. ANY OTHER LIMITED WARRANTY PERIOD OFFERED BY iStoragePro TO DIFFERENT PRODUCTS FREE FROM DEFECTS IN MATERIAL AND CRAFTSMANSHIP TO THE ORIGINAL PURCHASER WILL BE SPECIFIED IN OUR WRITTEN QUOTATION, CONTRACT OR IN ANY OTHER WRITTEN FORM TO PURCHASER. PURCHASER'S PURCHASE ORDER TO Ci DESIGN SHALL BE DEEMED IN ACCEPTANCE OF SUCH LIMITED WARRANTY. iStoragePro's WARRANTY PERIOD STARTS FROM THE DATE OF INVOICE. THESE ARE THE ONLY WARRANTIES Ci DESIGN OFFERS. iStoragePro MAKES NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, WRITTEN, ORAL OR STATUTORY, AND EXPRESSLY DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR ANY SPECIFIC PURPOSE, REGARDLESS OF ORIGIN. iStoragePro DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY FOR CLAIMS OF ACTUAL OR ALLEGED PATENT INFRINGEMENT FOR ANY iStoragePro PRODUCT, INCLUDING iStoragePro PRODUCTS THAT ARE COMBINED WITH HARDWARE, SOFTWARE, EQUIPMENT, OR OTHER MATERIALS NOT FURNISHED BY iStoragePro, INCLUDING ANY COVERAGE FOR COMPENSATORY DAMAGES, PUNITIVE DAMAGES, ATTORNEY FEES, COSTS, CONSEQUENTIAL DAMAGES, OR OTHER LOSSES, EXPENSES, OR DAMAGES. UNDER NO CIRCUMSTANCE IS iStoragePro LIABLE FOR ANY OF THE FOLLOWING EVEN IF PURCHASER HAS BEEN INFORMED OF THEIR POSSIBILITY: (a) LOSS OF, DAMAGE TO DATA, (b) INCIDENTAL OR CONSEQUENTIAL DAMAGES, (c) LOST BUSINESS, REVENUE, PROFIT, GOODWILL OR ANY ANTICIPATED SAVINGS, (d) THIRD PARTY CLAIMS AGAINST PURCHASER FOR DAMAGES.

RMA Procedures

Should it be necessary for any reason to return a product to iStoragePro, an RMA return authorization number must be obtained and the following procedures must be followed: (1) Fax or email a request to a iStoragePro representative stating reason for return and provide: purchase order number, invoice number, iStoragePro's part number, and serial number (when applicable). (2) Purchaser will be faxed or emailed a RMA number and instructions for returning products. (3) The RMA number must appear on the shipping label of each carton and all shipping documents that are being returned. RMA product must be received by iStoragePro within thirty (30) days after authorization date. (4) Purchaser must ship returned products "prepaid" unless iStoragePro has agreed in writing to other arrangements. (5) Under all circumstances, any products being returned to iStoragePro must be authorized via iStoragePro RMA procedures. (6) Items may be returned for replacement or credit only. Cash refunds will not be given without specific written authorization made at the time the RMA is issued by iStoragePro. Items being returned must be original iStoragePro products and covered by an applicable warranty period. The authorized returned products must be packaged in their original packing material with all components included. All returned items must be in resalable condition, new or no usage. If these requirements are not met, iStoragePro will recover the loss via increased restocking charges or return the products to Purchaser. If Purchaser is requesting a credit to its account, Purchaser's written request for RMA must be made within three (3) days after the receipt of the applicable product(s). Upon acceptance of the returned product(s) by iStoragePro, Purchaser's account will be credited, less a 25% "restocking fee". iStoragePro cannot provide cash refunds.

UNDER NORMAL USE, SHOULD THE PRODUCT UNDER WARRANTY FAIL IN MATERIAL OR CRAFTSMANSHIP, iStoragePro WILL, AT ITS SOLE DISCRETION, (1) REPAIR AND RETURN THE PRODUCTS, FREIGHT PREPAID, AND HONOR THE BALANCE OF THE WARRANTY PERIOD OR (2) REPLACE OR SUBSTITUTE THE PRODUCTS, FREIGHT PREPAID, AND HONOR THE BALANCE OF WARRANTY PERIOD. PRODUCTS THAT HAVE BEEN DAMAGED THROUGH NEGLIGENCE, ACCIDENT, ABUSE, MISAPPLICATION, MODIFICATION, MISUSE OF THE PURCHASER OR ITS AGENT OR DAMAGED THROUGH SERVICES, UPGRADES, CHANGE VERSION OR EXPANSIONS PERFORMED BY NOT A iStoragePro's REPRESENTATIVE OR iStoragePro AUTHORIZED SERVICE PROVIDER WILL BE, AT PURCHASER'S DISCRETION, REPLACED AT PURCHASER'S COST OR RETURN TO PURCHASER UN-REPAIRED, FREIGHT COLLECT.

Preface

About this manual

This manual is the introduction of **iStoragePro iR16SAEJ** controller and it aims to help users know the operations of the disk array system easily. Information contained in this manual has been reviewed for accuracy, but not for product warranty because of the various environments/OS/settings, Information and specification will be changed without further notice. For any update information, please visit www.cidesign.com and your contact windows.

Copyright©2009, iStoragePro All rights reserved.

Thank you for using **iStoragePro** products; if you have any question, please e-mail to "info@istoragepro.com". We will answer your question as soon as possible.

Package content

- One JBOD controller **iR16SAEJ**: SAS (x2) -to- SAS (16 bays) RAID controller.
- Included: one 8470-8088 MiniSAS Cable

Please contact with "info@istoragepro.com" to get the latest user manual and firmware.

Important Notice

The support and service provided by iStoragePro applied only for DIRECT CUSTOMERS who purchase products from iStoragePro. For end users or indirect customers, please contact your distributor for better support and faster response. Please do not contact iStoragePro since you may not receive any response if YOU ARE NOT A DIRECT CUSTOMER OF iStoragePro.

Table of Contents

Chapter 1	Introduction.....	6
1.1	Features.....	6
1.2	JBOD introduction.....	6
Chapter 2	Getting started	8
2.1	Before starting.....	8
2.2	Management methods	8
2.2.1	System buzzer.....	8
2.2.2	LED	8
2.3	SAS JBOD expansion.....	9
Appendix	11
A.	Certification list.....	11
B.	Known issues.....	11

Chapter 1 Introduction

1.1 Features

iStoragePro iR16SAEJ is a high-performance RAID system.

iStoragePro iR16SAEJ controller features:

- 2 x 12.0 Gbps miniSAS (SFF 8088) host wide ports or
- 2 x 12.0 Gbps miniSAS (SFF 8088) JBOD expansion wide ports.
- Up to 4 **iR16SAEJ** controllers can be cascaded.
- Windows Cluster support.
- Disk auto spindown support.

iR16SAEJ SAS JBOD, supports SAS/SATAII drives. Currently, **iR16SAEJ** supports iStoragePro RAID controllers' JBOD expansion.

1.2 JBOD introduction

For **iR16SAEJ**, Serial-attached SCSI offers advantages over older parallel technologies. The cables are thinner, and the connectors are less bulky. Serial data transfer allows the use of longer cables than parallel data transfer.

There are some applications to connect with **iR16SAEJ**. Mostly, it is used as the expansion of RAID subsystem and can be cascaded up to 4 **iR16SAEJ**. The expansion port of RAID subsystem connects to IN connector of **iR16SAEJ**; then the OUT connector connects to the next **iR16SAEJ** ...etc. Besides, **iR16SAEJ** can be connected to host directly. The host will display available disks in disk manager. Another application is Windows cluster; two hosts connect to IN connectors of **iR16SAEJ**.

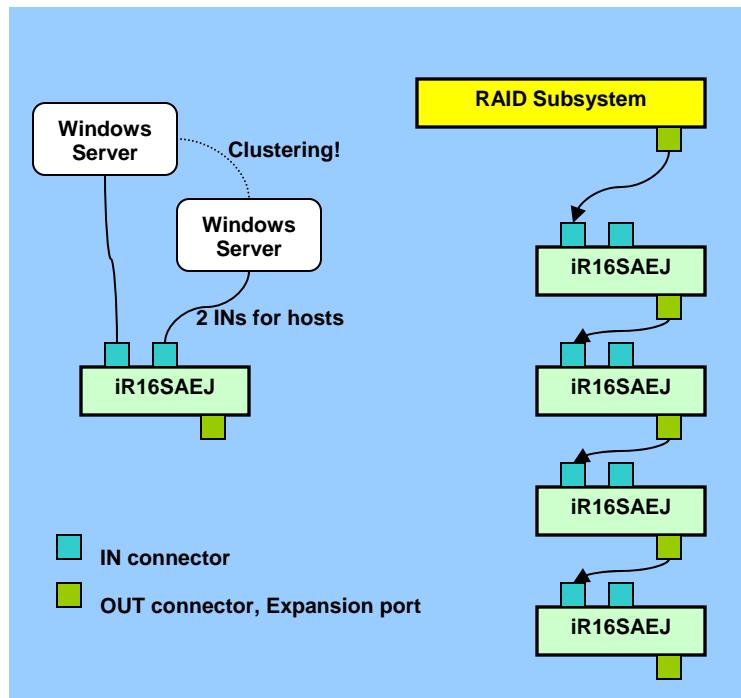


Figure 1.2.1

Chapter 2 Getting started

2.1 Before starting

Before starting, prepare the following items.

1. Check “**Certification list**” in Appendix A to confirm the hardware setting is fully supported.
2. A server with a SAS HBA. (direct connection only)
3. RAID subsystem. (JBOD expansion support models)
4. SAS cables.
5. Setup the hardware connection before power on hosts and **iStoragePro** controllers. Connect SAS cables in advance.

**Tip**

The best policy of power on sequence would be **iR16SAEJ**, RAID subsystem, and then hosts.

2.2 Management methods

To manage **iStoragePro** JBOD system, please check the following steps:

2.2.1 System buzzer

The system buzzer alarms continuously when there is error occurred. The alarm will be stopped after error resolved or be muted.

2.2.2 LED

The LED features are listed below:

1. **Disk Activity LED:** Hardware activated LED when accessing disks (IO).
2. **Disk Power LED:** Hardware activated LED when the disks are plugged in and powered on.
3. **Disk Failure LED:** Hardware activated LED when the disks are failed and in
4. **System power-on LED(white in color):** Hardware activated LED when the system is turned on

5. **PSU status LED:** Hardware activated LED for PSU status.
 - PSU GOOD: lid up in white color
 - PSU failure: lid up in red color
6. **FAN status LED:** Hardware activated LED for FAN status.
 - FAN GOOD: lid up in white color
 - FAN failure: lid up in red color
7. **Temperature LED:** Hardware activated LED for Temperature status.
 - Temperature GOOD: lid up in white color
 - Temperature failure: lid up in red color

2.3 SAS JBOD expansion

Currently, **iStoragePro subsystems** support SAS JBOD expansion to connect extra SAS JBOD controllers. When connecting to a SAS JBOD which can be detected, it displays tabs on the top in “/ **Volume configuration / Physical disk**”. For example, Local, JBOD 1 , JBOD 2, ...etc. Local means disks in local controller, and so on. The disks in JBOD can be used as local disks.

- Select - ▾
Free disks ●
Global spares ●
Dedicated spares ●

[Local](#) [JBOD 1](#)

<input type="checkbox"/>	Slot	WWN	Size (GB)	VG name	Status	1	2	Speed
<input type="checkbox"/>	1	201000137800002c	465	r5	Good	f RD		3.0Gb/s
<input type="checkbox"/>	2	23160013780000ce	465	r5	Good	f RD		3.0Gb/s
<input type="checkbox"/>	3	201900137800002d	465	r5	Good	f RD		3.0Gb/s
<input type="checkbox"/>	4	201a00137800002d	465	r5	Good	f RD		3.0Gb/s
<input type="checkbox"/>	5	5000cca003e0e9e8	33	r6	Good	f RD		3.0Gb/s
<input type="checkbox"/>	6	5000cca003e0e4dd	33	r6	Good	f RD		3.0Gb/s
<input type="checkbox"/>	7	5000cca003e0ec33	33	r6	Good	f RD		3.0Gb/s
<input type="checkbox"/>	8	5000cca003e0e3db	33	r6	Good	f RD		3.0Gb/s

- Select - ▾
Free disks ●
Global spares ●
Dedicated spares ●

Figure 2.3.1

(Figure 2.3.1: Display all PDs in JBOD 1.)

“/ Enclosure management / S.M.A.R.T.” can displays S.M.A.R.T. information of all PDs, including Local and all SAS JBODs.

Local

Slot	HDD type	Read error rate	Spin up time	Reallocated sector count	Seek error rate	Spin up retries	Calibration retries	Temperature (C)
1	SATA	63(6)	98(0)	100(36)	88(30)	100(97)	N/A	47
2	SATA	99(60)	109(24)	100(5)	100(67)	100(60)	N/A	43
3	SATA	N/A	223(63)	253(63)	253(0)	253(157)	253(223)	47
4	SATA	N/A	226(63)	221(63)	253(0)	253(157)	253(223)	50
5	SATA	100(16)	111(24)	100(5)	100(67)	100(60)	N/A	44
6	SATA	100(16)	110(24)	100(5)	100(67)	100(60)	N/A	43
7	SATA	100(60)	110(24)	98(5)	100(67)	100(60)	N/A	39

JBOD 1: (WWN: 5001378002900FFD)

Slot	HDD type	Read error rate	Spin up time	Reallocated sector count	Seek error rate	Spin up retries	Calibration retries	Temperature (C)
1	SATA	N/A	190(63)	253(63)	253(0)	253(157)	253(223)	39
2	SATA	N/A	191(63)	253(63)	253(0)	253(157)	253(223)	42
3	SATA	99(6)	97(0)	100(36)	87(30)	100(97)	N/A	41
4	SATA	86(6)	97(0)	100(36)	87(30)	100(97)	N/A	41
5	SAS	N/A	N/A	N/A	N/A	N/A	N/A	42
6	SAS	N/A	N/A	N/A	N/A	N/A	N/A	39
7	SAS	N/A	N/A	N/A	N/A	N/A	N/A	39
8	SAS	N/A	N/A	N/A	N/A	N/A	N/A	38

Figure 2.3.2

(Figure 2.3.2: Disk S.M.A.R.T. information of Local and JBOD 1, although S.M.A.R.T. supports SATA disk only.)

SAS JBOD expansion has some constraints as described in the followings:

1. Up to 4 SAS JBODs can be cascaded.
2. Created RG/VG can not use PDs which located in different controllers. It means that RG/VG can be composed of PDs which are all in Local or one SAS JBOD.
3. Global spare disk only supports all RGs/VGs which located in the same controller.

Appendix

A. Certification list

- **SAS HBA card**

Vendor	Model
LSI Logic	SAS3442X (PCI-X, 3 Gb/s, 1 external x4 SFF 8470 , 1 internal x4 SFF 8484)
LSI Logic	SAS3442E-R (PCI-Express, 3 Gb/s, 1 external x4 SFF 8470 , 1 internal x4 SFF 8484)
LSI Logic	SAS3800X (PCI-X, 3 Gb/s, 2 external x4 SFF-8470)
LSI Logic	SAS3801E (PCI-Express, 3 Gb/s, 2 external x4 SFF-8088 mini-SAS)

- **Hard drive**

iR16SAEJ supports SAS disk.

Vendor	Model
Hitachi	Ultrastar 15K147, HUS151436VLS300, 36GB, 15000RPM, SAS 3.0Gb/s, 16M
Seagate	Cheetah 15K.4, ST336754SS, 36.7GB, 15000RPM, SAS 3.0Gb/s, 8M
Seagate	Cheetah 15K.5, ST373455SS, 73.4GB, 15000RPM, SAS 3.0Gb/s, 16M
Seagate	Cheetah 15K.5, ST3146855SS, 146.8GB, 15000RPM, SAS 3.0Gb/s, 16M
Seagate	Cheetah NS, ST3400755SS, 400GB, 10000RPM, SAS 3.0Gb/s, 16M
Seagate	Barracuda ES.2, ST31000640SS, 1000GB, 7200RPM, SAS 3.0Gb/s, 16M

B. Known issues

1. When two controllers (with SAS JBOD expansion) connect to **iStoragePro iR16SAEJ** (SAS JBOD), they can not detect all PDs of JBOD.

Workaround solution: It's a JBOD limitation.

Disclaimer

Information in this document is provided in connection with Ci Design and iStoragePro products. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document. In no event will Ci Design or iStoragePro be liable to the purchaser, or to any user of the Ci Design or iStoragePro product, for any damages, expenses, lost revenues, lost savings, lost profits, or any other incidental or consequential damages arising from the purchase, use or inability to use the Ci Design or iStoragePro product, even if Ci Design or iStoragePro has been advised of the possibility of such damages.

Ci Design or iStoragePro may make changes to specifications and product descriptions at any time, without notice.

Ci Design and iStoragePro are registered trademarks of Ci Design, other trademarks or trade names mentioned herein are hereby acknowledged as being the property of their respective companies.

Copyright © 2009, Ci Design Inc. All Rights Reserved.