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## RSI-SAS36EXP

36-Port Serial Attached SCSI  
(SAS) Expander



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# OVERVIEW

The RSI-SAS36X is a 36-port, 3 Gb/s Serial Attached SCSI (SAS) expander in a 1U rackmount enclosure and provides large storage environments the ability to connect multiple targets and initiators through a switched device for scalability and fault tolerant path redundancy to improve system reliability. It is fully compliant with ANSI Serial Attached SCSI specification with improved performance, cabling, and power requirements. The RSI-SAS36X supports Serial Attached SCSI Protocol, SAS management protocol, Serial ATA protocol, and Serial ATA tunneling protocol. The RSI-SAS36X expander supports 1.5 Gb/s and 3 Gb/s data transfer per port.

Rancho's RSI-SAS36X expander complies with SAS standard and enhanced reliability compared to parallel SCSI. Rancho's SAS expander provides functionality for connecting targets and initiators with up to 36 phys integrated for SAS initiators, SAS targets, SAS expanders, or Serial ATA (SATA) target devices. The RSI-SAS36X supports both wide and narrow port configurations.

## GENERAL FEATURES

This section summarizes the features of the RSI-SAS36X SAS expander.

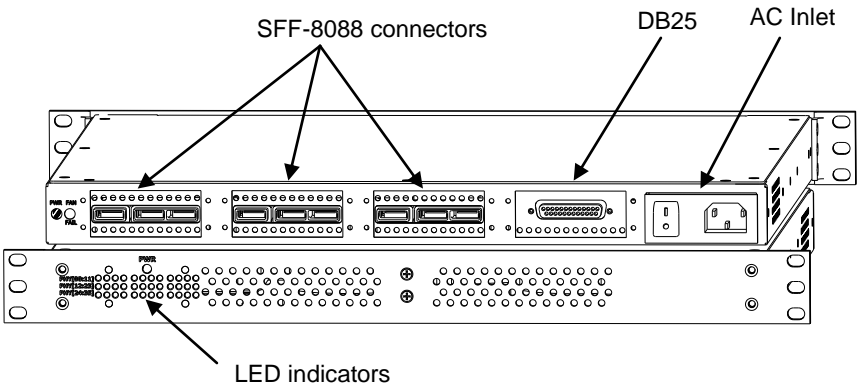
- Dimension 1.72 x 17 x 16 inches, fits 19" rackmount
- Weight 12.5 lbs
- 36 fully independent SAS and SATA ports
- SSP, SMP, STP, and SATA support
  - SSP Target and Initiator
  - SMP Target and Initiator
  - STP Target and Initiator
- SAS 1.1 compliance
- Supports 1.5 and 3.0 G/bs SAS and SATA
- Port independent auto negotiation
- Port are non denominational for Initiator or Target connect
- Provides low latency connection using crossbar module
- Supports Direct, Subtractive decode, and Table routing
- Supports wide and narrow port configurations
- Phy-based Zoning for system security
  - Allows re use of routing table resources across all of the phys composing a wide port
  - Allows any number of phys for wide port support
- SATA/SAS HDD spin-up sequencing per-phy basis
- Provides power and activity LED indicators
- Provide EPP parallel port for management
- Operating system transparent\*

# SPECIFICATIONS

This section describes the RSI-SAS36X SAS expander general specifications.

**Table 1 – RSI-SAS36X specifications**

Operating voltages	100-240 VAC @ 50/60Hz
Power consumption	20Watts
Connectors	9 X SFF-8088 (iPass/Mini SAS) 1 X DB25
Throughput	3.0 Gb/s
Operating temperature	0-50° C
Relative humidity	5-95% non condensing



**Figure 1 – 36port SAS expander**

## LED COLOR PATTERN

1. Solid green when devices are connected and ready
2. Blinking green for SAS/SATA activity
3. Off when no devices are connected

# SAS PINOUT ASSIGNMENTS

This section describes the signal assignments for pin in MiniSAS (iPass) SFF-8088 external connectors.

**Table 2 – SAS external compact connector pin assignments**

Signal	Signals based on physical links supported by cable			
	One	Two	Three	Four
RX0+	A2	A2	A2	A2
RX0-	A3	A3	A3	A3
RX1+	NC	A5	A5	A5
RX1-	NC	A6	A6	A6
RX2+	NC	NC	A8	A8
RX2-	NC	NC	A9	A9
RX3+	NC	NC	NC	A11
RX3-	NC	NC	NC	A12
TX3+	NC	NC	NC	B12
TX3-	NC	NC	NC	B11
TX2+	NC	NC	B9	B9
TX2-	NC	NC	B8	B8
TX1+	NC	B6	B6	B6
TX1-	NC	B5	B5	B5
TX0+	B3	B3	B3	B3
TX0-	B2	B2	B2	B2
GND	A1 A4 A7 A10 A13 B1 B4 B7 B10 B13			
	Key: NC = Not connected			

# **SAS ROUTING**

The RSI-SAS36X supports direct routing, table routing, and subtractive routing. The individual routing method is configurable for each individual port through the management software.

## ***DIRECT ROUTING***

Direct routing is done on the SAS initiators, SAS/SATA targets that direct attached to RSI-SAS36X ports.

## ***SUBTRACTIVE ROUTING***

Subtractive routing occurs when the RSI-SAS36X routes unresolved addresses to a specific port. Subtractive routing is enabling through the register bus interface.

## ***TABLE ROUTING***

The RSI-SAS36X supports up to 1024 routing table entries. Table routing is used for cascading multiple SAS expanders.

# APPLICATIONS

This section describes typical SAS topologies in common SAS environments.

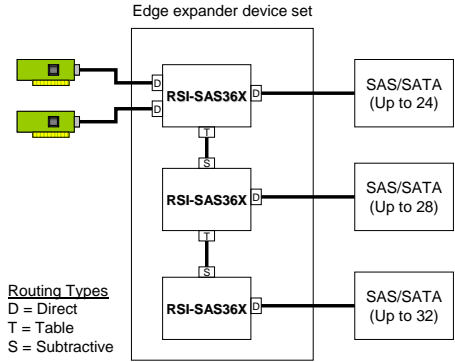


Figure 2 – RSI-SAS36X in multiple applications

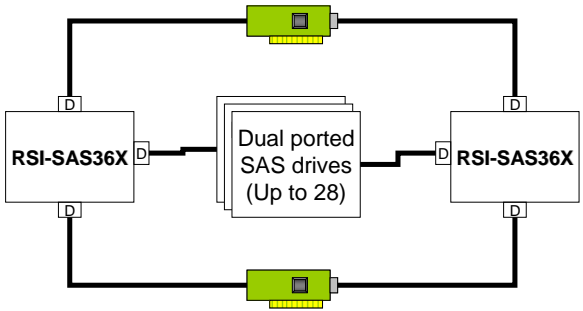


Figure 3 – Multi path redundancy application

# INSTALLATION INSTRUCTIONS

## PACKING LIST

Examine the following items that are included in the shipping package.

- RSI-SAS36X rackmount unit
- AC power cable

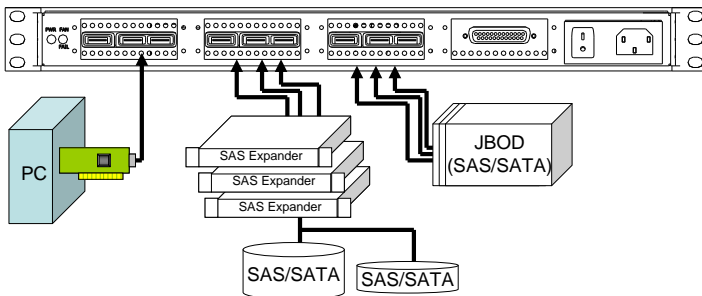
## SAFETY GUILINES

This product shall only be accessed, assembled, and service by technically qualified personnel or technicians to avoid personal injury and property damage.

## CABLING

The RSI-SAS36X only supports parallel cable (DB25) in EPP mode. All port configurations and managements are managed through this interface.

This SAS expander unit only accepts SFF-8088 (MiniSAS/iPass) interface. Please consult the cable pin out for proper signals.



**Figure 4 – Typical application**

# SAS MANAGEMENT

This section describes the RSI-SAS36X basic device managements.

## SOFTWARE INSTALLATION

Extract the WinSAS utility for the RSI-SAS36X to a folder of choice. The latest version can be obtained from Rancho's website. Execute the "Winx36util.exe" file to display the main GUI. Make sure to use a straight parallel cable together with EPP mode setting. Check your system CMOS for proper setting.



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