



IW-RS224-03

User's Manual

Table of Content

PREFACE	P.3
SAFETY INFORMATION	P.3
SPECIFICATIONS	P.5
1 Product Introduction	
1.1 Box Content	P.6
1.2 General Information	P.7
1.2.1 Front Panel Controls and Indicators	P.8
1.2.2 Rear Panel Configuration	P.9
2 Hardware Installation	
2.1 Removing and Installing a Hard Drive	P.10
2.1.1 Installing a Hard Drive	P.10
2.1.2 Removing a Hard Drive	P.10
2.2 Removing and Installing Top Cover	P.11
2.3 Removing and Installing a Fan Module	P.12
2.3.1 Removing a Fan Module	P.12
2.3.2 Installing a Fan Module	P.12
2.4 Removing and Installing a PSU Module	P.13
2.4.1 Removing a PSU Module	P.13
2.4.2 Installing a PSU Module	P.14
2.5 Installing Slide Rail	P.14
2.5.1 Identifying the slide Rail	P.14
2.5.2 Take out the inner rail and slide the intermediate rail back	P.14
2.5.3 Attach the inner rail to the chassis	P.15
2.5.4 Mount the rail bracket to the cabinet	P.15
2.5.5 Insert the chassis to the cabinet	P.16
2.6 Installing Motherboard	P.17
2.7 Connecting Cable	P.18
3 Backplane Introduction	P.19
4 Expander Board Introduction	P.20
4.1 Key Features	P.21
4.2 UART Usage	P.22
4.2.1 UART configuration	P.22
4.2.2 System Revision	P.23
4.2.3 System Monitoring	P.24



4.2.4	Disk PHY Status	P.25
4.2.5	Firmware Update	P.26
4.2.5.1	SAS Expander Operation Firmware Update	P.26
4.2.5.2	SAS Expander MFG CFG Binary Update	P.28
5	Compatibility Lists	P.29
6	Q&A	P.29
7	Technical Support	P.32





PREFACE

Thank you for choosing In Win IW-RS224-03. This manual is written for system technicians who are responsible for installation, troubleshooting, managing, and repairing this server chassis. This document provides the overview of all the features of the chassis, a list of accessories or other components you may need to finish the installation, troubleshooting methods, and instructions of adding and removing components on the In Win IW-RS224-03. For the latest version of this manual, you may visit In Win's server website to download the latest updated version.

SAFETY INFORMATION

To ensure safe and smooth operation of your In Win IW-RS224-03, it is essential that you choose an appropriate location for the system, provide an appropriate operating environment, and adequate power for all components of the system. As you plan for installation, follow the guidelines below to ensure that the system and its environment are safely and appropriately positioned for efficient operation and service. Your system should be installed and serviced only by technically qualified persons.

Environment selection: The system is designed to operate in a typical office environment. The location should be a clean, dry, and free of airborne particles; a well-ventilated room and away from sources of heat including direct sunlight and radiators; it should keep the sources of vibration or physical shock away; the space should be with a properly grounded wall outlet, and with sufficient space to access the power supply cords. The operation environment temperature should be around 0°C to 40°C (32°F to 104°F).

Heed safety instructions: Before working with In Win IPC/Storage server/ System products, we strongly recommend you are using this guide as a reference and follow the safety instructions. The instructions in this manual will help you ensure and maintain compliance with existing product certifications and approvals. Follow the described, regulated components mentioned in this manual. Use of non UL listing products or other regulatory did not approvals will make non-compliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power button DOES NOT totally turn off the system AC power. To remove the power of system, you have to unplug the AC power cord from the outlet or system's power supply units. Make sure the power cord is unplugged before you open the chassis, add, or remove any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions usually present on power supply units, and communication cables. Disconnect the power cord, and any other device which attached to the server before opening the case. Otherwise, it will raise the risk of personal injury or equipment damage.

Electrostatic discharge (ESD) and ESD protection: In most cases, ESD damages disk drives, electronic boards, and other parts. We recommend that you work the installation only at an ESD free space. If the situation does not allow, perform ESD protection actions by wearing an anti-static wrist strap attached to ground any unpainted metal surface on your server during your operation.

Installing or removing jumpers: A jumper is a short length of conductor used to close, open or bypass part of an electronic circuit. Jumpers on In Win backplane have a small tab on top that you can pick up with your fingertips. Grip the jumper carefully, and plug the jumper to cover the jumper pins on the backplane. Once you need to remove the jumper, gripping the jumper, and carefully pull out without squeezing.

CAUTION



To avoid damage and prove your safety, please notice and following the terms listed below:

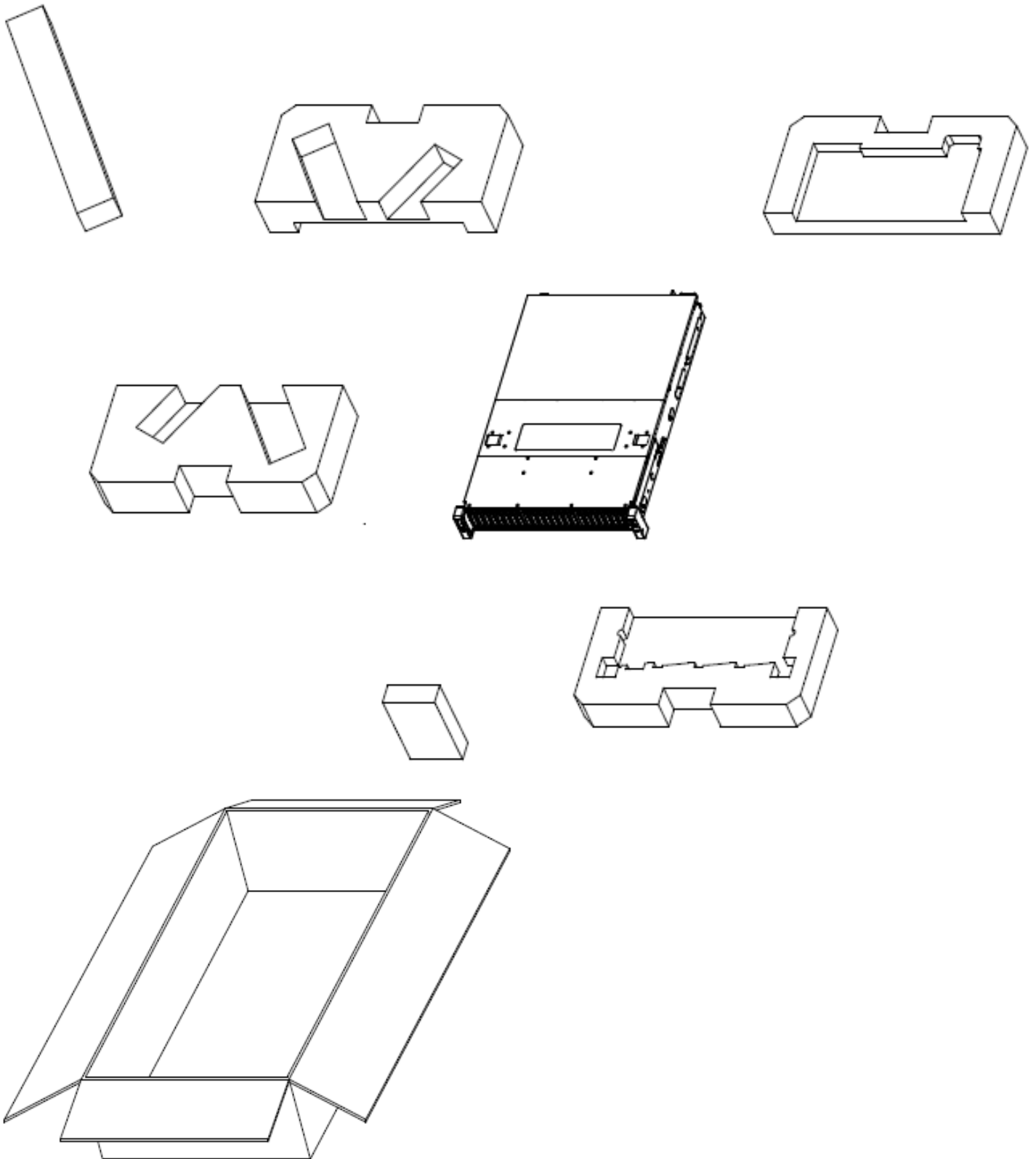
1. No to populate hard drives and turn on the power before the system is settle down.
2. Tighten or loosen all the screws, please use screw driver to operate.
3. Apply the correct screws which packed in the accessories box.
4. For your safety, it requires at least two persons lift, and place the unit.
5. Before mounting the unit to the cabinet, make sure the rail is installed correctly.
6. When installing and removing any module or parts, please operate by the handles.

SPECIFICATIONS

Model Name	IW-RS224-03
Standard	EIA-RS310D
M/B Form Factor	ATX (12" x 9.6"); ATX(12" x10"); EEB(12" x 13")
Dimensions (D x W x H)	660.4 x 482.6 x 87 mm (26" x 19" x 3.5")
Drive Bay	External: Hot Swap 2.5" x 24 Internal: 2.5" HDD x 2 or Rear 2.5" Hot-Swap for OS (SSD 7mm) x 2 (Optional)
Power Supply	Supports ▪ Form Factor: Platinum CRPS Redundant ▪ Watt: 800W
Indicator	Power LED, LAN1/LAN2/LAN3/LAN4 LED, System LED, ID LED
Front Control Panel	Power on/off, Reset, NMI, ID SW, USB3.0 x1, Mute button
Backplane	MINI SAS HD /12Gb/s with expander
Cooling Fan	Supports 8038mm PWM Fan x3, 4028mm Fan x2 Modularize design with anti-vibration
Expansion Slot	Low Profile PCI Slot x 7
SAS 12G Expander support	LSI Expander support
Material	Material: SGCC Thickness: 1.0 mm
Slide Rail	Support 20" or 28" screwless slide rail, Ball-bearing

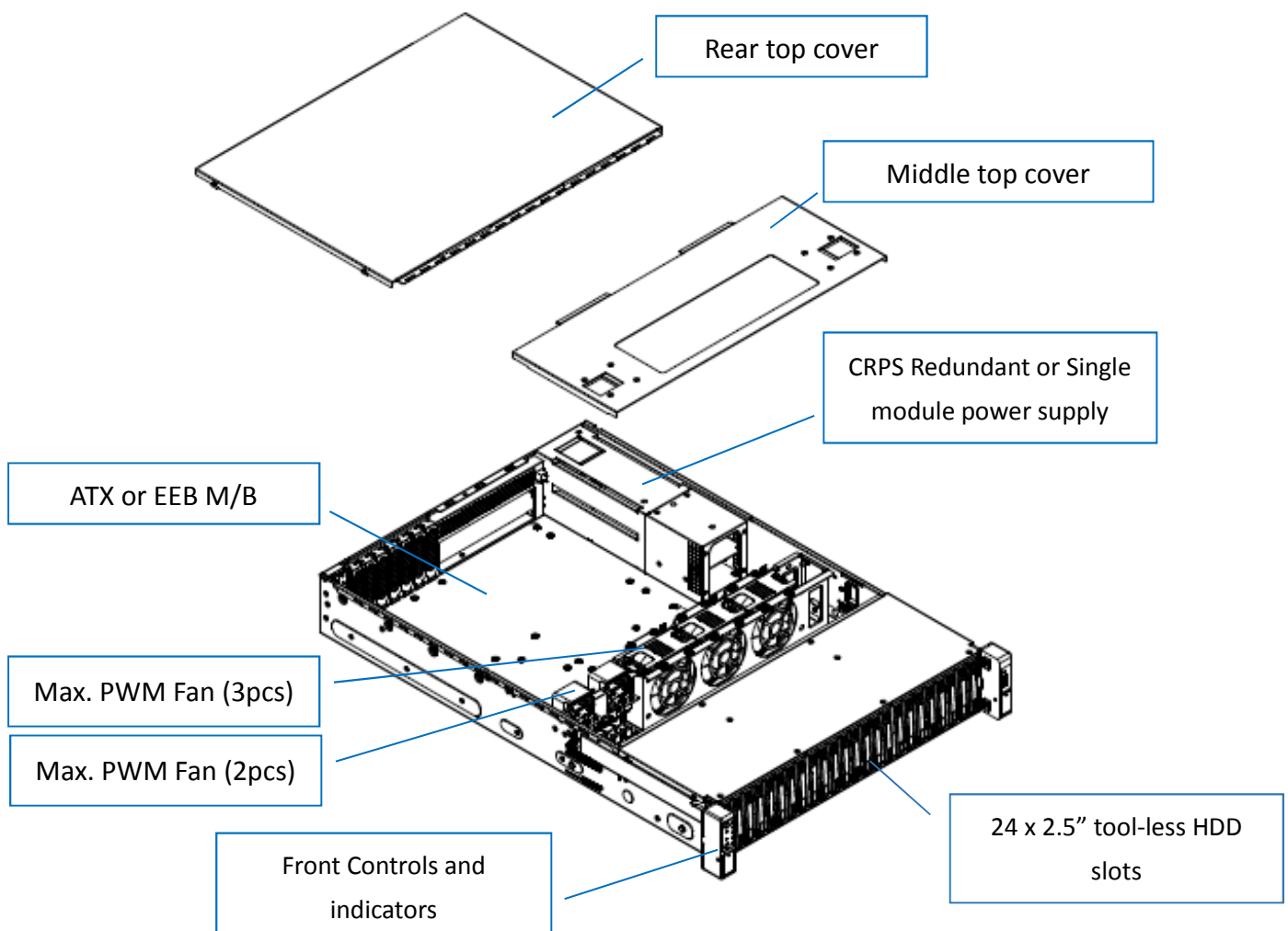
1 Product Introduction

1.1 Box Content

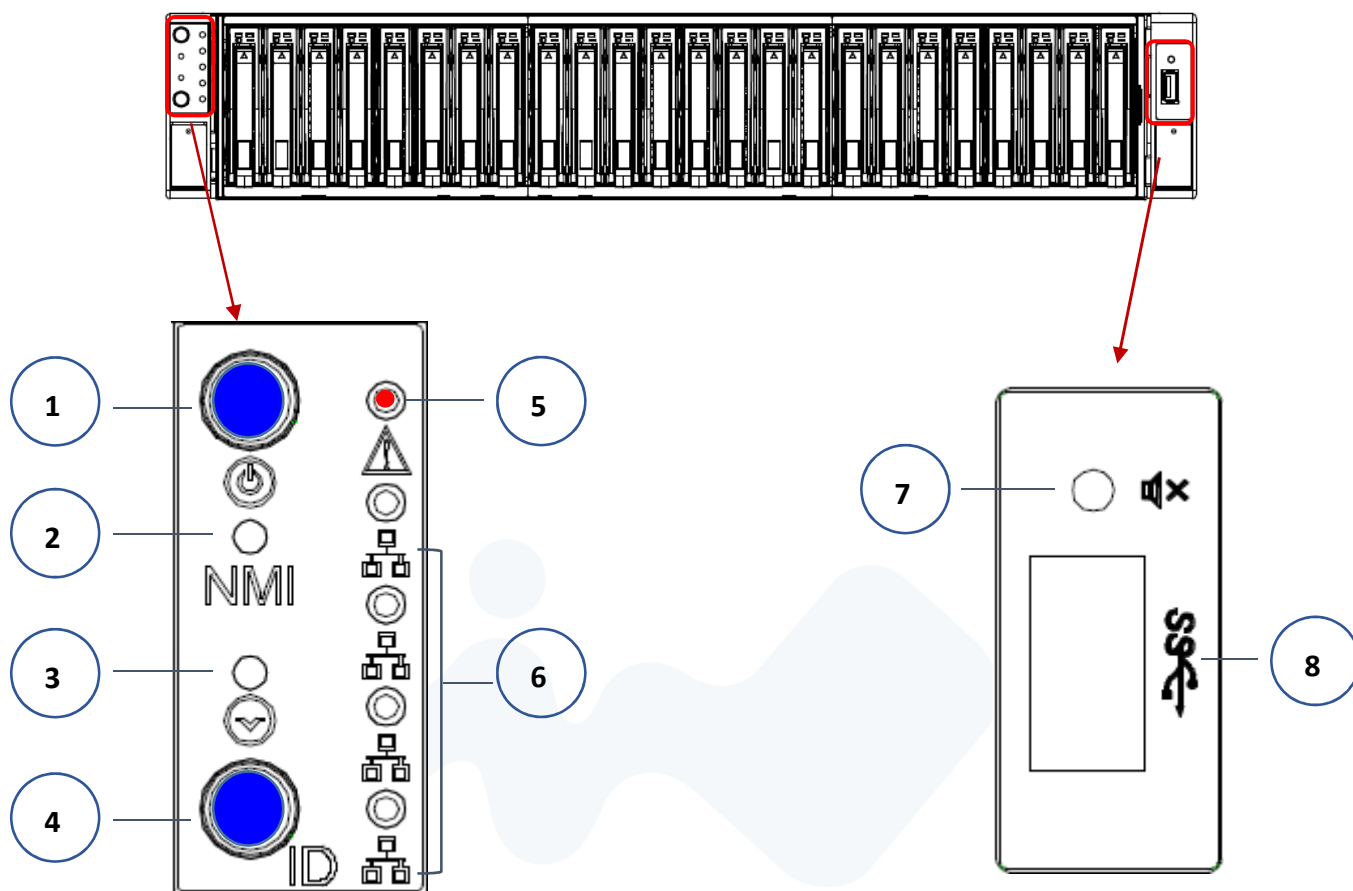


1.2 General Information

When you open the chassis should be like the diagram shows.

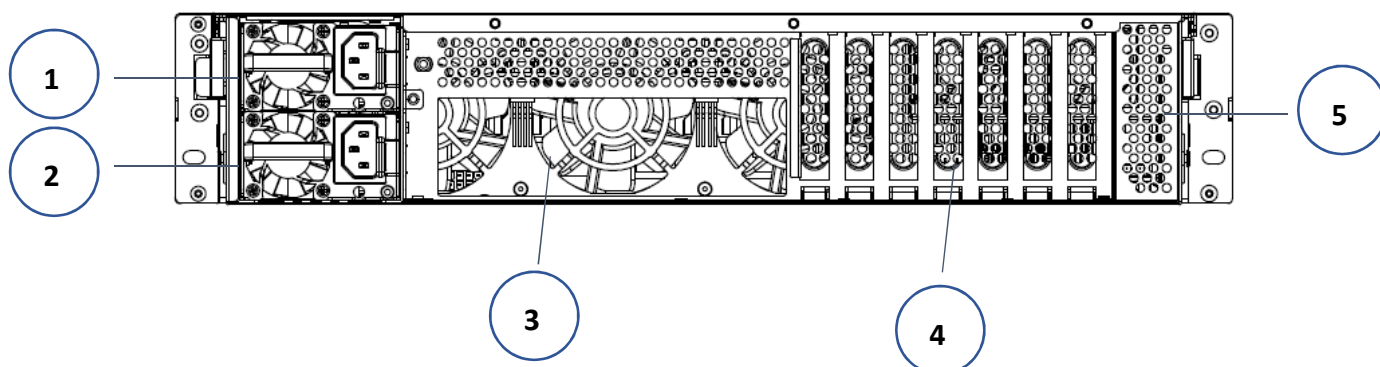


1.2.1 Front Panel Controls and Indicators



No.	Name	Color	Status	Description
1	Power ON/OFF Button with LED	Blue	Solid on	System is powered on
		N/A	Off	System is not powered on
2	NMI Button	N/A		Press the button to activate user define
3	System Reset Button	N/A		Press the button to activate system reset
4	Chassis ID Button with LED	Blue	Solid on	Press the button to activate system identification
5	System Fail LED	Red	Solid on	System Fault (Beeper)
		N/A	Off	No date transmission or receiving is occurring
6	LAN LED (From top to bottom ranked LAN1 - LAN4)	Amber	Blink	Link between system and network
		N/A	Off	No date transmission or receiving is occurring
7	Mute Button	N/A		Press the button to activate beeper mute
8	USB3 Connector	N/A		USB devices connection

1.2.2 Rear Panel Configuration



No.	Name	Description
1	Power Module 1	Default primary power supply module
2	Power Module 2	Backup power supply module
3	System I/O (depend on M/B specification)	The I/O shield should come with motherboard or provided by motherboard vendors
4	7 Low Profile PCI E Slot	The slot support low profile cards. The bracket should be removed before using.
5	OS HDD	This slot is for In Win OS disk backup module (option), which support two 2.5" 7mm SSD and hot swap function.

2 Hardware Installation

2.1 Removing and Installing a Hard Drive

In Win IW-RS224-03 supports both standard and extra height 2.5" disks.

2.1.1 Installing a Hard Drive

Step 1: Press the release button then pull outward the handle

Step 2: Pull the handle outward to release the disk tray

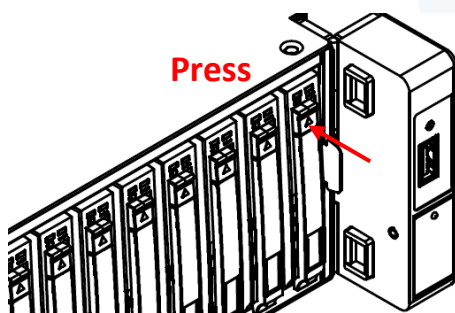
Step 3: Place your hard drive on the disk tray, and make sure the connector is in rear window

Step 4: Flip over the tray, use the 4 HDD screws from the accessory box to mount the hard drive

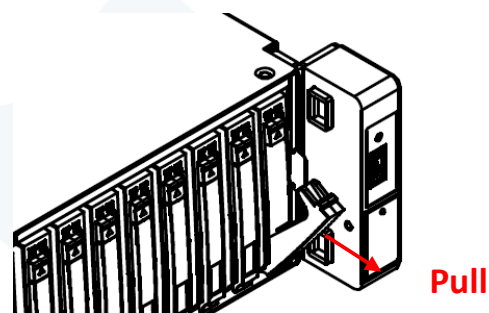
Step 5: Put back the disk tray with hard drive to the chassis' terminal

Step 6: Push back the handle to the original point to complete the installation

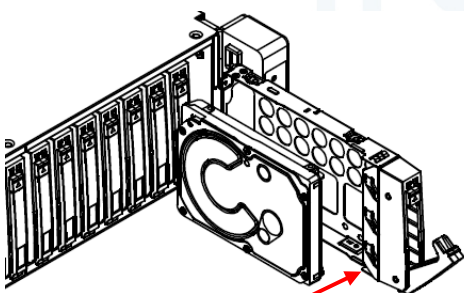
Step 1



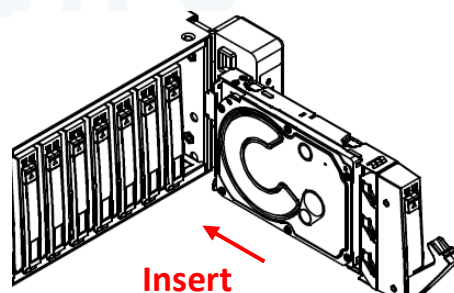
Step 2



Step 3 & 4



Step 5 & 6

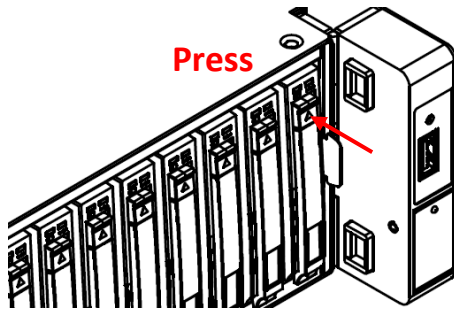


2.1.1 Removing a Hard Drive

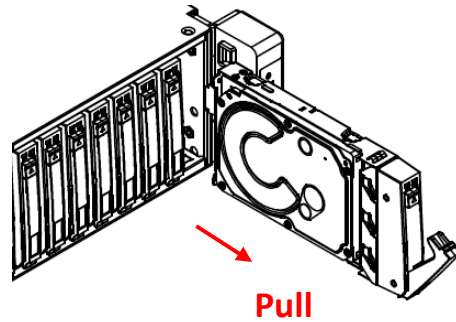
Step 1: Press the release button then pull outward the handle to release the disk tray

Step 2: Flip the disk tray over, and unscrew the 4 screw to remove the drive

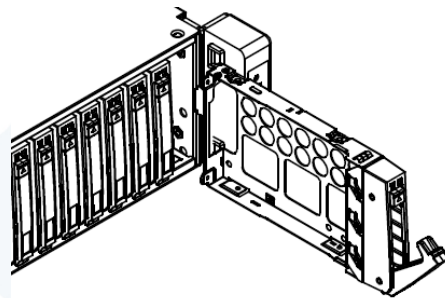
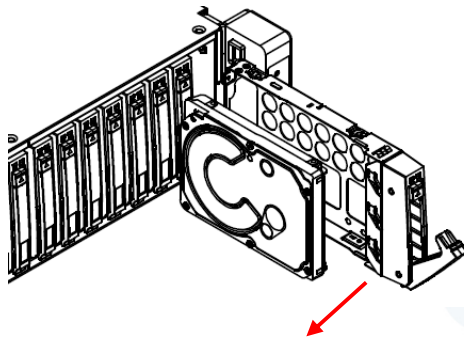
Step 1



Step 2



Step 2



2.2 Removing and placing Top Cover

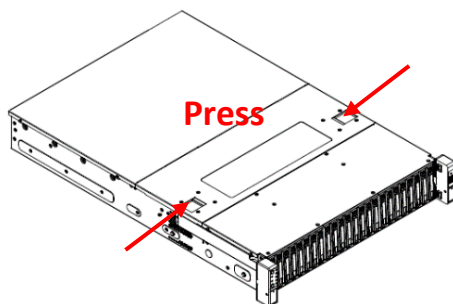
Step 1: Press inward the button then lift the middle top cover up

Step 2: Loosen the screws of the rear top cover on the both sides, pull back the cover and lift to Remove it.

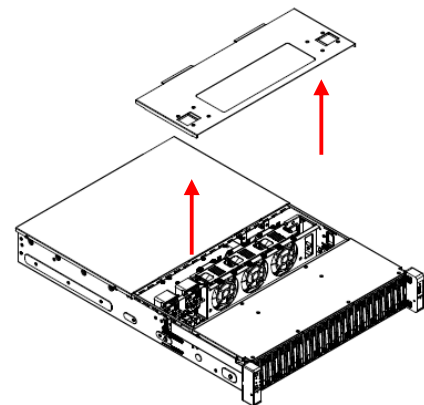
Step 3: To place the cover, mount the rear cover and push it to the fitted location. Screw up to fix the rear cover.

Step 4: Put down the middle cover and make sure the clip clicks.

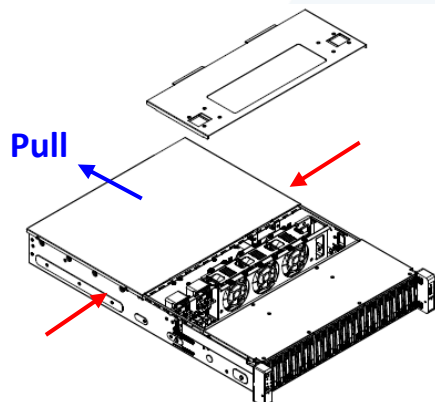
Step 1



Step 2



Step 3



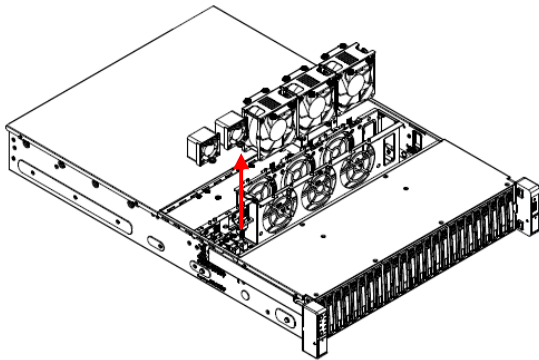
2.3 Removing and Installing a Fan Module

2.3.1 Removing a Fan Module

Step 1: Unplug the fans' power cable from the motherboard if necessary

Step 2: Hold and lift the fan module from the chassis

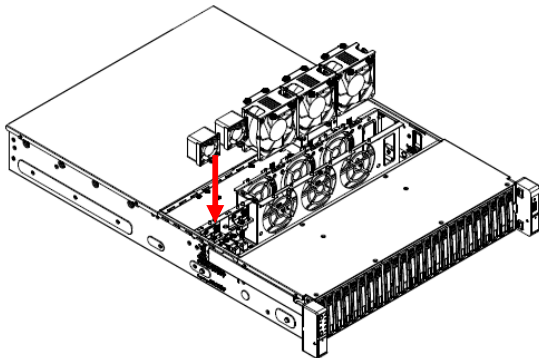
Step 1



2.3.2 Installing a Fan Module

Step 1: Hold and put the fan into the fan slot

Step 1



2.4 Removing and Installing a PSU Module

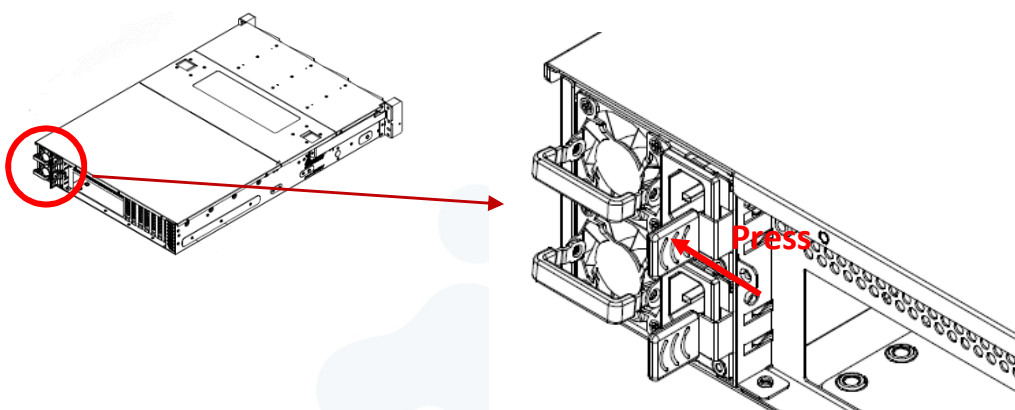
In Win IW-RS224-03 built-in a redundant power supply module. With this function, system is capable to keep working whether as one power supply unit is failure. To replace it, user only need to release the failure one then insert a good one.

2.4.1 Removing a PSU Module

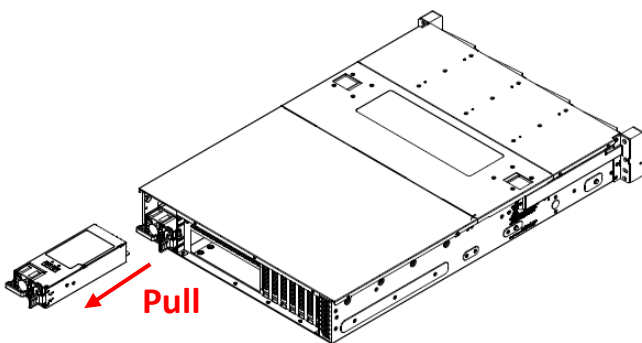
Step 1: Press the release tab on the back of power supply unit

Step 2: Pull the power supply unit out using the handle

Step 1



Step 2

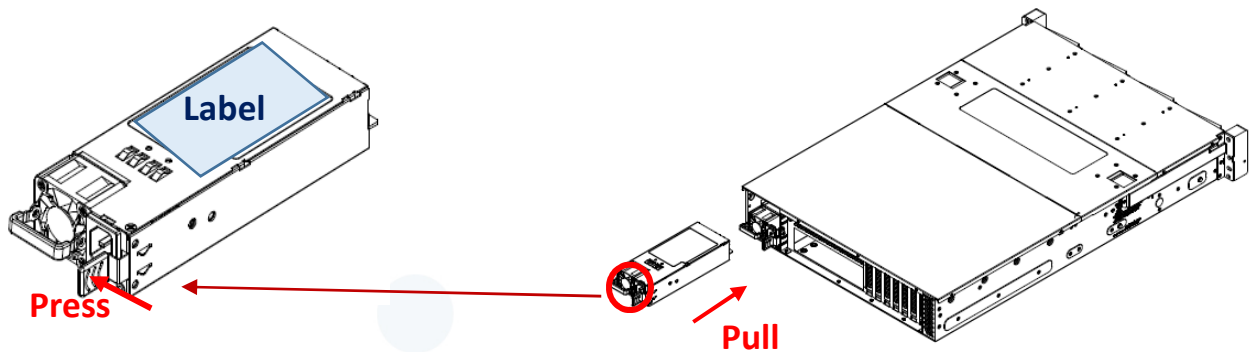


2.4.2 Installing a PSU Module

Step 1: Make sure the label faces up, and push the power supply module into the cage until you hear a click.

NOTE : 1. The unit supports In Win PSU module only, please do not insert other brands of PSU.
2. The two PSU modules' output wattage must be the same.

Step 1



2.5 Installing Slide Rail

In Win IW-RS224-03 is a rackmount model, which support EIA-RS310D standard cabinet and chassis rack. In Win provides standard slide rail to let users mount the chassis on to the cabinet.

2.5.1 Identifying the slide Rail

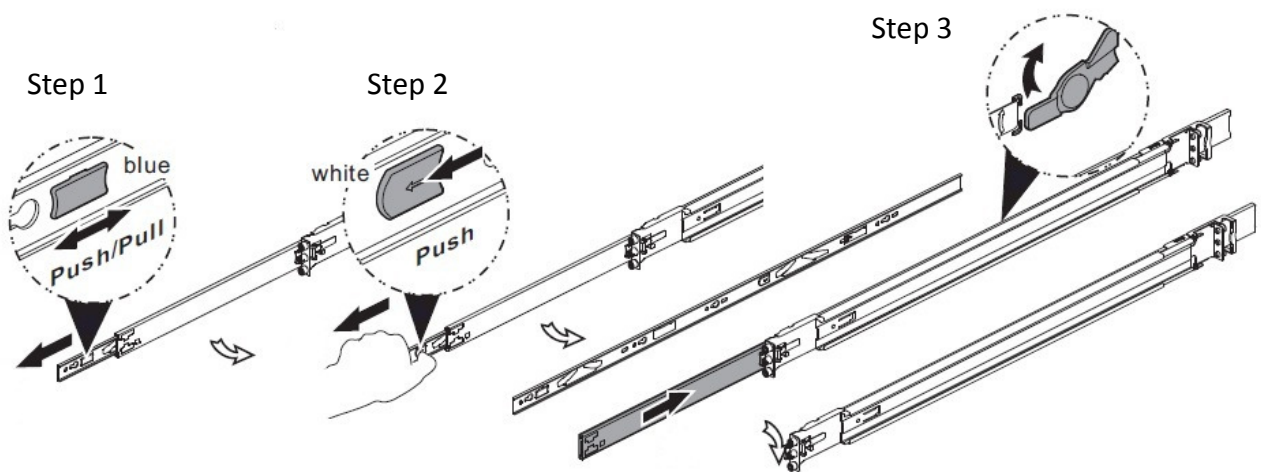
The slide rail by your order might be different. You can reference the quick installation guide inside the slide rail package and follow the instruction to mount the rail on to your cabinet or chassis rack.

2.5.2 Take out the inner rail and slide the intermediate rail back

Step 1: Pull out the inner rail until it hits the terminal, then pull the blue release tab to unlock.

Step 2: Continue pulling the inner rail to the second stop, pull the white tab to release the inner rail.

Step 3: Pull the latch on the medium rail and push back the medium rail back.

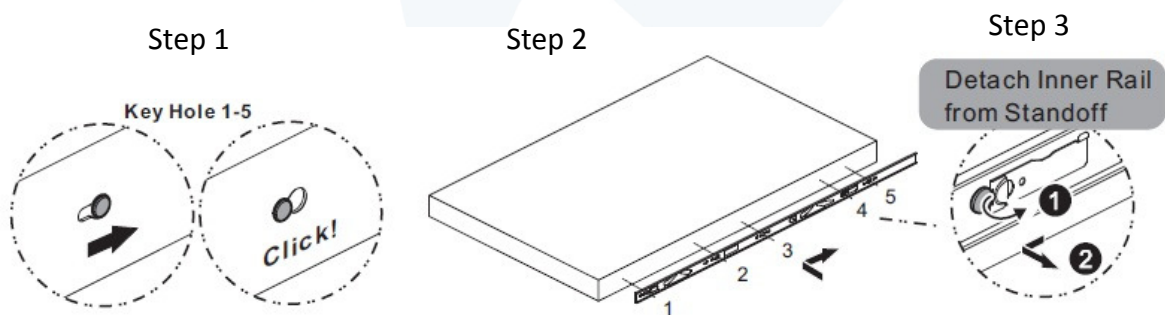


2.5.3 Attach the inner rail to the chassis

Step 1: Install the inner rail onto the chassis. Make sure the key holes and the standoff are well locked which you will hear a click.

Step 2: Repeat the same action to the other side.

Step 3: When removing the inner rail, pulling the latch upward and release the keyhole from standoff to detach the inner rail. (Action ❶ and ❷ in the figure)



2.5.4 Mount the rail bracket to the cabinet

Step 1: Extend the bracket over the rear rack of the cabinet.

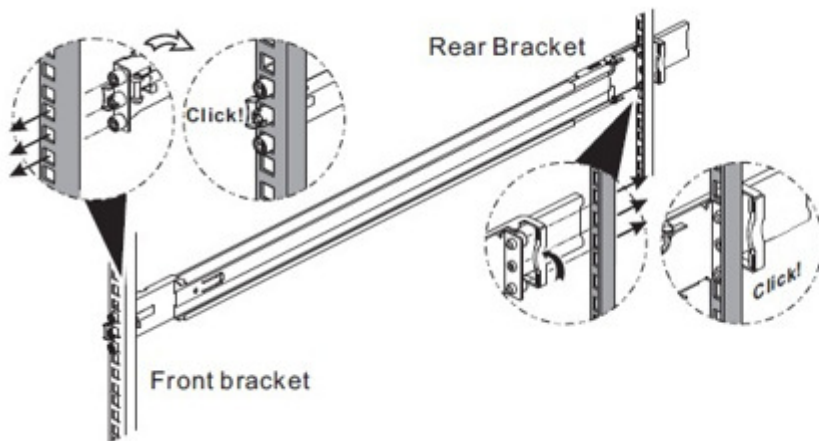
Step 2: Pull back to and push bracket's standoff into the screw holes on the rack, if your action is correct, you will hear a click.

Step 3: Extend the opposite side of bracket to the front rack of the cabinet.

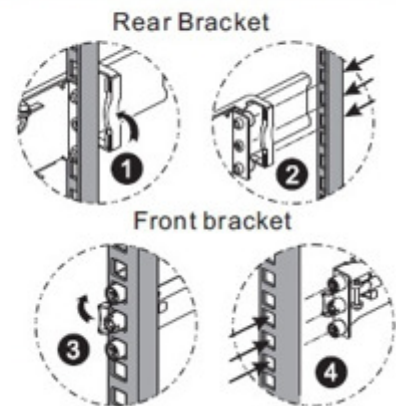
Step 4: Pull the bracket to let the standoff over the screw holes on the front rack until you hear a click.

Step 5: The other side of rail is symmetrical, repeat the installation Step 1-4.

Step 6: Once you would like to detach the bracket, pull the release tab on the rear bracket and Pull the latch on the front bracket to release the bracket. Repeat the same action to the other side.



Detach Bracket from Rack Post



2.5.5 Insert the chassis to the cabinet

Step 1: Pull out the medium rail to the stop position.

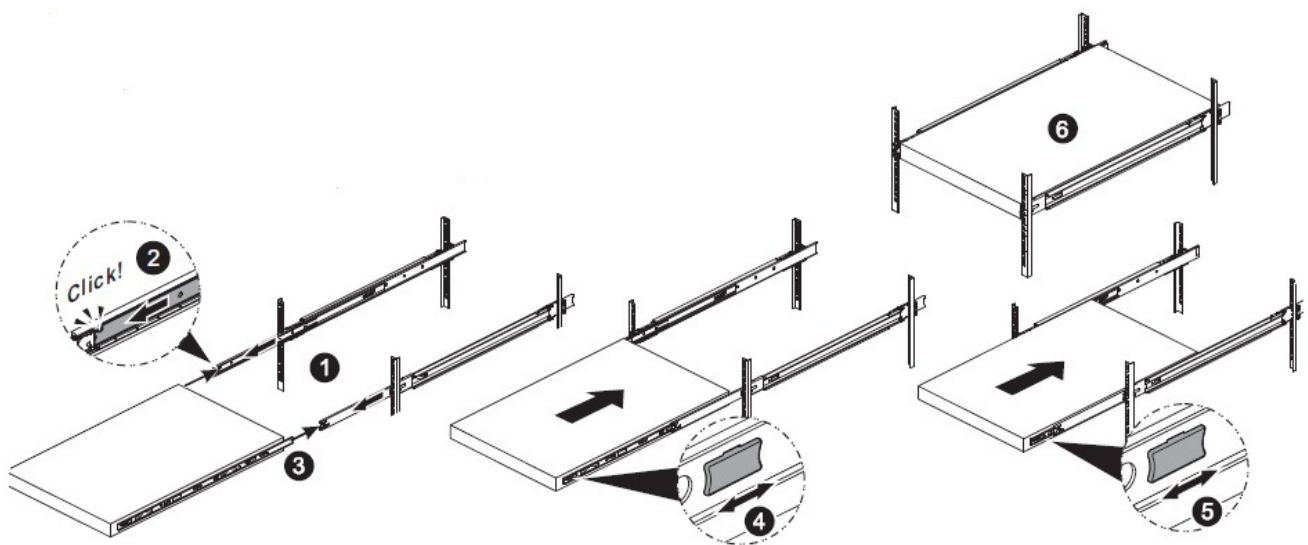
Step 2: Let the ball bearing retainer is at the front end of the middle rail, you will hear a click if the action is correct.

Step 3: Insert the inner rail on the both side of chassis, into the middle rail.

Step 4: Push the chassis to the terminal position, then pull the blue release tab to continue.

Step 5: When reaching the second stop position, pull the blue release tab again to continue.

Step 6: Pull the chassis into rack completely, and make sure the front end of the chassis align with the edge of the rack to complete the installation.



2.6 Installing motherboard

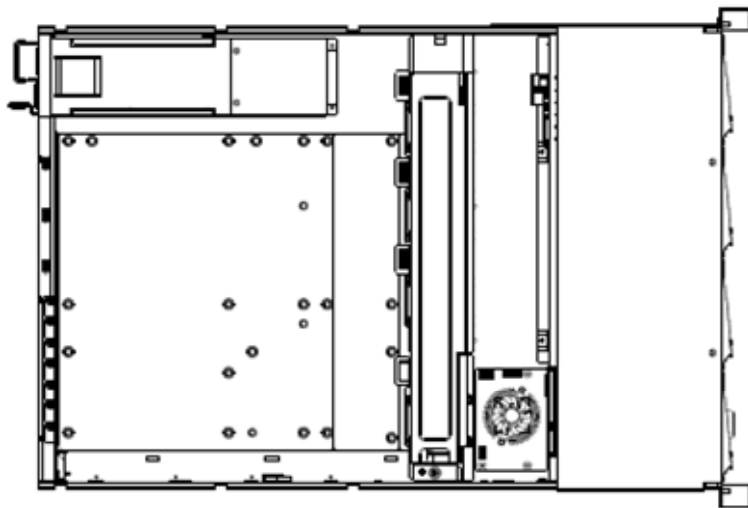
Before installing the motherboard, please find the IO shield from your motherboard package, and install it to the system IO window 1.2.2 shows. If you cannot find the IO shield, please check with your motherboard vendor, or contact In Win for IO shield OEM service.

Step 1: Measure the motherboard location and removing the plastic dots to appear the holes.

Step 2: Install the steel pillars, which you can find in the accessories box to the holes matching the motherboard's mounting holes, you may use a flathead screw driver.

Step 3: Place the motherboard down to the chassis, and make sure the pillars' threaded holes are matching the mounting holes on the motherboard.

Step 4: Use hex screws from the accessories box to fix the motherboard in the chassis.



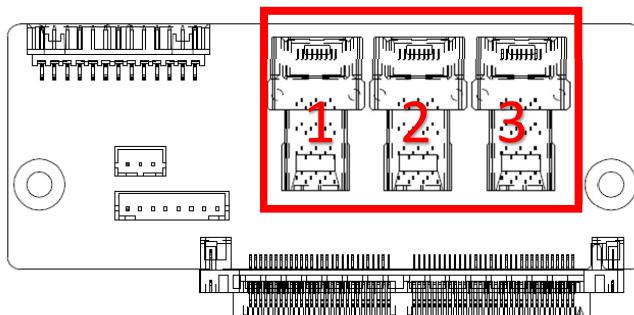
2.7 Connection Cable

2.7.1 Connecting expander through SAS connectors

In Win IW-RS224-03 needs SAS 8643 cable to connect the expander to your motherboard. By the difference of spec, you will need different type of cable. You can purchase the cable from In Win, or source any SAS 8643 cable which meets STA standard by yourselves.

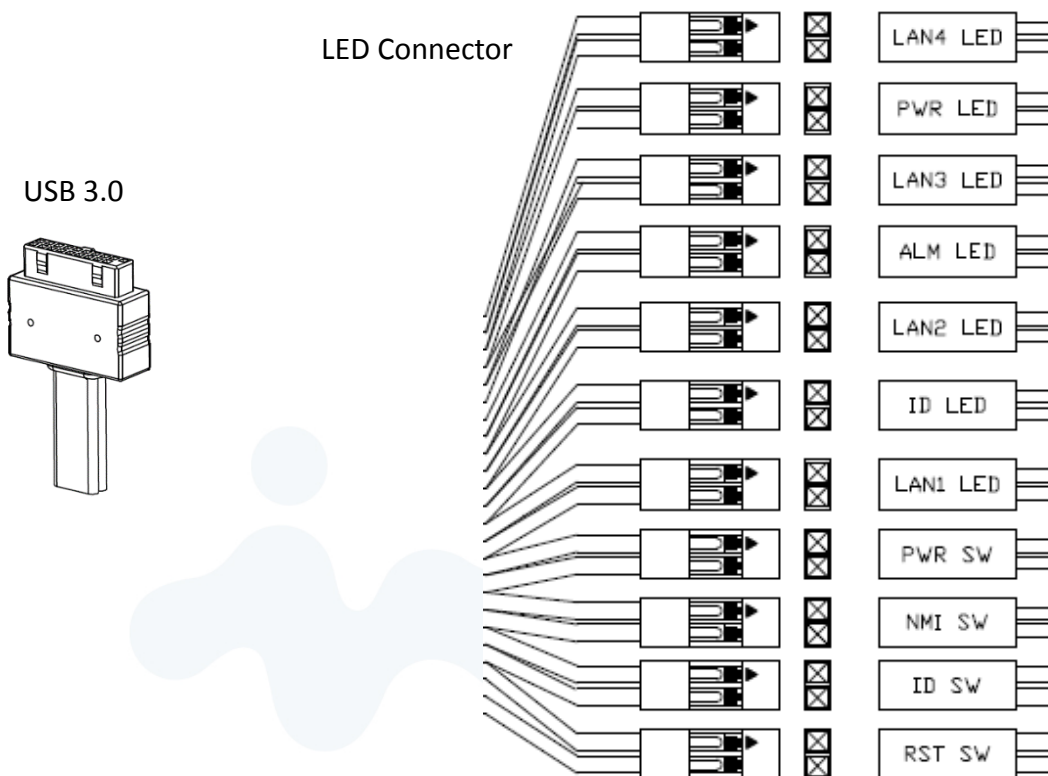
Port 2 and 3 are for connecting to motherboard or RAID controller; port 1 is for cascade.

SAS connectors



2.7.2 Connecting LED, front control panel and front USB IO ports

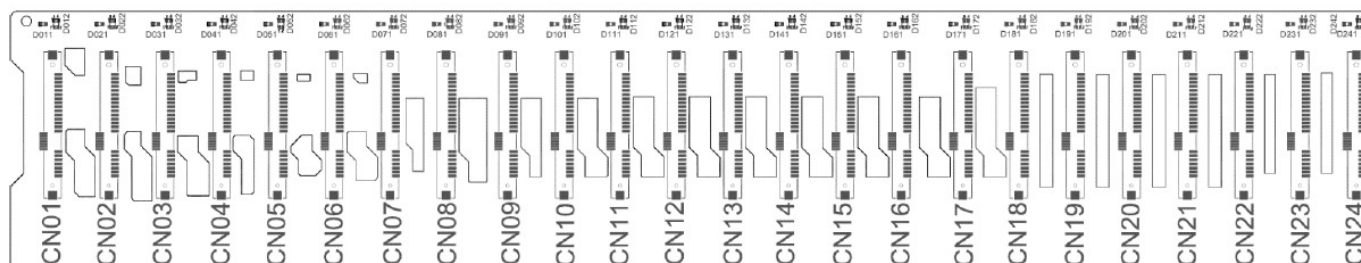
As 1.2.1 describes, In Win IW-RS224-03 built-in a set of front control panel and USB access ports. You need to cover the connectors to the pins on the motherboard to activate the functions. The pin function and location you can find from your motherboard's user guide.



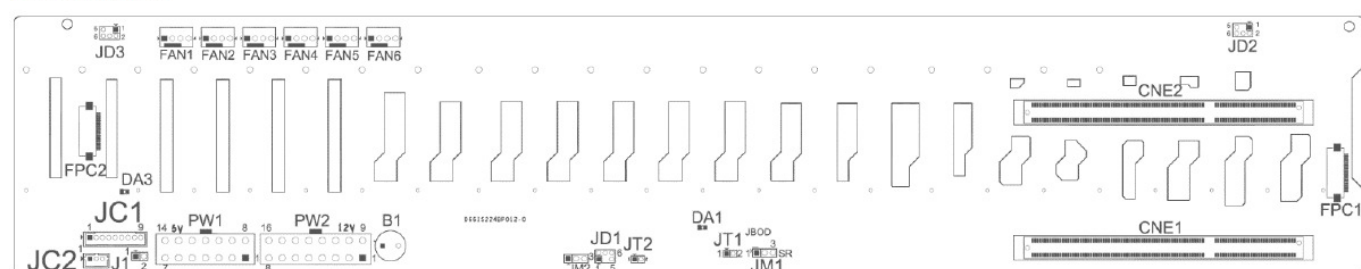
Connector Name	Abbreviation	Color	Front IO Indication
Power Switch	PWR SW	Brown	Power ON/OFF Button with LED
Power LED	PWR LED	Purple	Power ON/OFF Button with LED
NMI Switch	NMI SW	Yellow	NMI Button
Reset Switch	RST SW	Orange	System Reset Button
ID Switch	ID SW	Blue	Chassis ID Button with LED
ID LED	ID LED	Green	Chassis ID Button with LED
Alarm LED	ALM LED	Red	System Fail LED
LAN 1 LED	LAN1 LED	Gray	LAN LED
LAN 2 LED	LAN2 LED	Gray	LAN LED
LAN 3 LED	LAN3 LED	Gray	LAN LED
LAN 4 LED	LAN4 LED	Gray	LAN LED
USB 3.0 Connector	None	Black Flat	USB 3.0
Mute Switch	Mute	White	Mute Switch

3 Backplane Introduction

Top Side



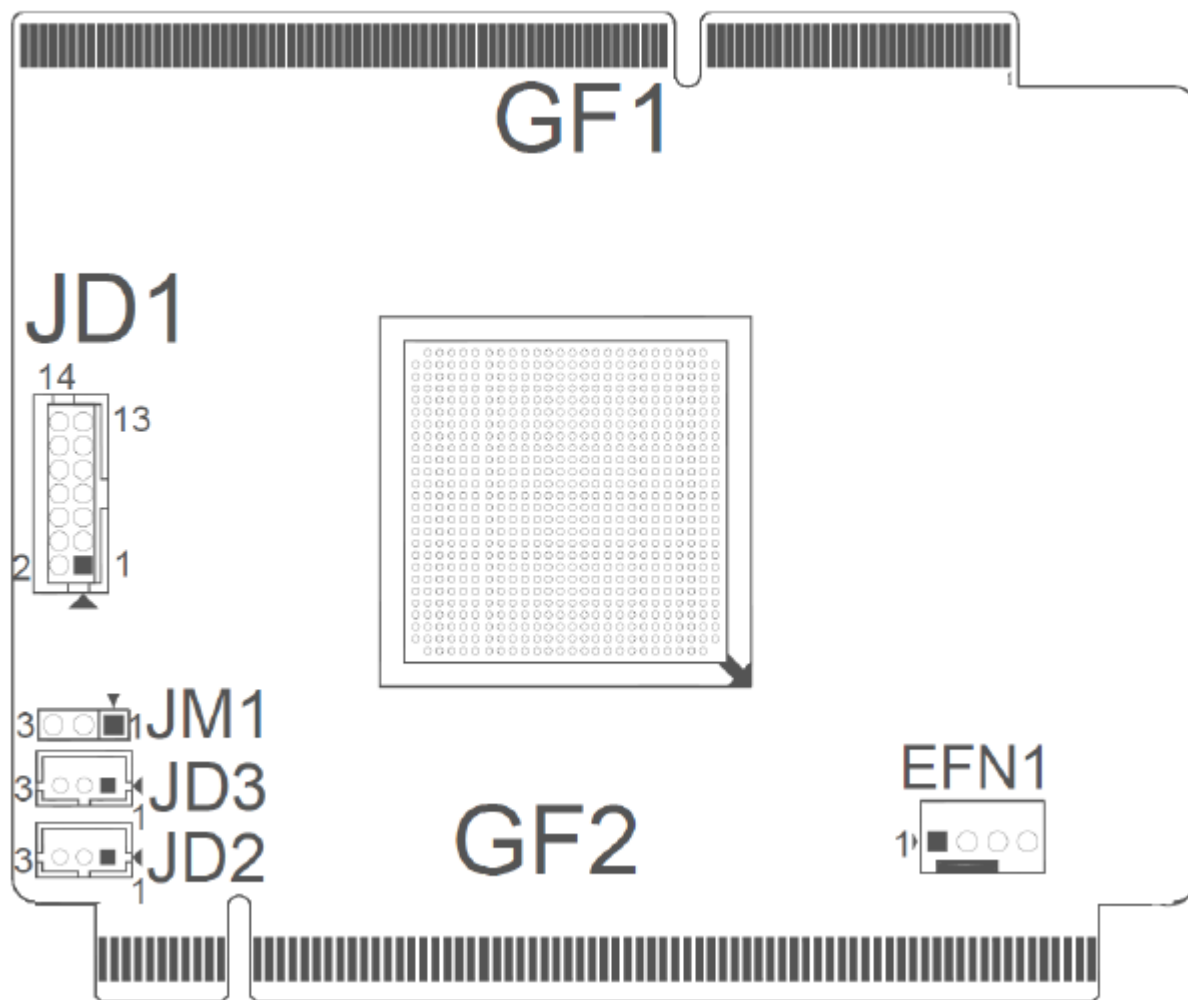
Bottom Side



Location	Description
CN01-CN12	SAS Receptacle Connector (SAS 12Gb/s 3.5"HDD Connector)
Dxx1	HDD PowerLED
Dxx2	HDD Access/Fault LED
CNE1	Primary SAS Expander Slot
CNE2	Secondary SAS Expander Slot
JD1-JD2	MCU Programming(Factory only)
208FPC1	FrontSwitch FPC/IOBoard Connector
FPC2	FrontSwitch FPC/IO Board Connector(Factory only)
PW1	ATX 2x7P 5V Power Connector
PW2	ATX 2x8P12VPower Connector
JT1	HW LED Test(Factory only)
JT2	HW TEST(Factory only)
J1	Mute SW Connector
JM1	Server/JBODMode Select
JM2	HDD LED Behavior Select
JC1	PDB Control Connector
JC2	PMBUS Control(Factory only)
B1	Global Fail Warning

4 Expander Board Introduction

Top Side



Location	Description
GF1	BP Golden Finger Connector
GF2	IO Board Golden Finger Connector
EFN1	Expander FAN Connector
JM1	Single/Dual Power Module Select: Single: Jumper 1-2; Dual: Jumper 2-3
JD1	ICE Debug Port
JD2	Smart Console
JD3	Debug Port

4.1 Key features

- Reliable High Data Rate support (up to 12Gbps)
 - SAS 12Gbps support and SATA3 6Gbps support to provide a reliable high performance data rate.
- HDDs hot-swap-able
 - HDD is hot-swap-able. No need to shutdown system for HDD installation and/or replacement while there is HDD failure happens or intend to add new HDD to the system.
- Cascading
 - There is a cascading port on Expander for cascading to another Expander for expanding disk space.



4.2 UART Usage

4.2.1 UART configuration

RS-232 UART port on Expander module provides a serial connection for users to manage with terminal application such as Tera Term, Hyper Term...etc.

To manage Expander through UART port, the settings below have to be properly configured to make it work.

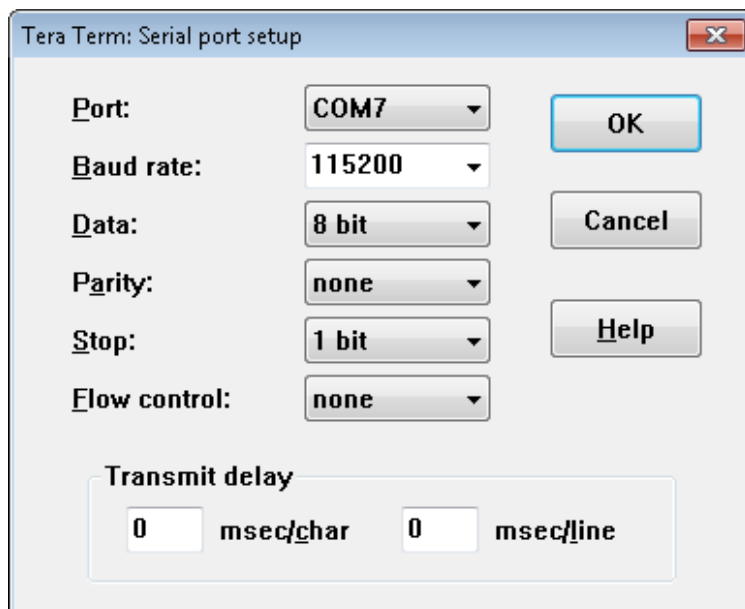
Baud Rate : 115200

Data : 8 bit

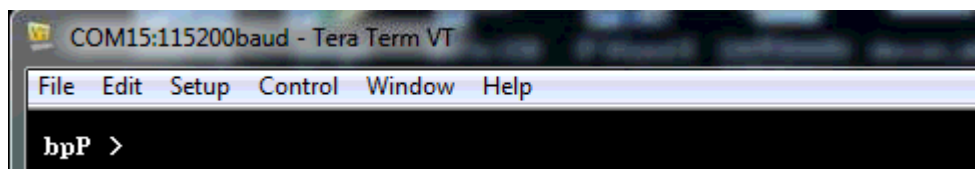
Parity : None

Stop Bit : 1 bit

Flow Control : None



When connected, there is a prompt display on terminal then users can start typing CLI commands



4.2.2 System Revision

To check the Expander revision, typing “rev” and “sys rev” to get the expander information such as Vendor ID, Firmware Version, SAS Address, ...etc.

```
COM15:115200baud - Tera Term VT
File Edit Setup Control Window Help

bpP >rev

=====
Hardware Revision Information:-
=====

Vendor ID           : IN WIN
Product ID          : RS-212-03p
Product Revision Level : Minor = 0x10, Unit = 0x00
Component Type       : Cobra-R
Component ID         : 0x0235 (Bond Option :28)
Component Revision Level : 3 (C1)
Backplane Type       : 2U12 3.5"
Expander Type        : Normal

=====
Firmware Revision Information:-
=====

Active Firmware: Firmware Copy 1
Revision: 00.01.00.00
Platform Name: H24R-3X (LSISAS3Exp)
Version Name: 00.01.00.00. 08/05/2016 12:14

Boot Loader Image:
Revision: 00.01.00.0F
Platform Name: H24R-3X (LSISAS3Exp)
Version Name: 00.01.00.15. 07/25/2016 16:02
Firmware Family: 0 OemFamily: 6816
Fast Boot: Yes Image Address: 0x10000000

Firmware Copy 1:
Revision: 00.01.00.00
Platform Name: H24R-3X (LSISAS3Exp)
Version Name: 00.01.00.00. 08/05/2016 12:14
Firmware Family: 0 OemFamily: 6816
Fast Boot: Yes Image Address: 0x10180000

Firmware Copy 2:
Revision: 00.01.00.0F
Platform Name: H24R-3X (LSISAS3Exp)
Version Name: 00.01.00.15. 07/25/2016 16:02
```

```
bpP >sys rev

Vendor ID       : IN WIN
Product ID      : RS-212-03p
Hardware Version: 0
Firmware Version: 1.0.0 08/05/2016 12:14
MPG CFG Version : 1.0.0 08/05/2016 12:15
SAS address     : 5B0BD6D1A301113F

bpP >|
```

4.2.3 System Monitoring

To monitor the enclosure sensor status such as temperature and DC power amplitude by command “sys” in the UART

```
COM15:115200baud - Tera Term VT
File Edit Setup Control Window Help

bpP >sys

Platform      : H24R-3X
EDFB state    : enable

<< Manual Configuration >>
System Config : default
Product Identity : default

<< Alarm Status>>
Fan alarm      : 0x0
Temp alarm     : 0x0
Voltage alarm   : 0x0
PSU alarm      : 0x0

<< Thermal Profile Table >>
Threshold      Quiet      Regular      Aggressive      Hysterical
Level          Trig-Speed Trig-Speed    Trig-Speed      Trig-Speed
00             14(C) - 0  *14(C) - 1  14(C) - 3      14(C) - 6
01             18(C) - 1  *18(C) - 1  18(C) - 4      18(C) - 6
02             24(C) - 1  *24(C) - 2  24(C) - 5      24(C) - 6
03             32(C) - 2  *32(C) - 3  32(C) - 6      32(C) - 7
04             36(C) - 4  *36(C) - 4  36(C) - 7      36(C) - 7
05             42(C) - 5  *42(C) - 5  42(C) - 7      42(C) - 7
06             52(C) - 6  *52(C) - 6  52(C) - 7      52(C) - 7
07             60(C) - 7  *60(C) - 7  60(C) - 7      60(C) - 7
PWM Ctrl      : disable

<< Enclosure Monitor >>
Temperature
< 1> Exp Die   : 47 dC      status : OK
< 2> Sense BP1 : 24 dC      status : OK
< 3> Sense BP2 : 24 dC      status : OK
Voltage
< 1> 5V Sensor : 5.06 U     status : OK
< 2> 12V Sensor: 12.12 U    status : OK

bpP >
```

```
bpP >sys alarm

Temperature      3 0x0
< 1> Exp Die     : 47 dC      status : OK
< 2> Sense BP1   : 25 dC      status : OK
< 3> Sense BP2   : 24 dC      status : OK
Voltage          2 0x0
< 1> 5V Sensor   : 5.05 U     status : OK
< 2> 12V Sensor  : 12.12 U    status : OK
```

4.2.4 Disk PHY Status

To monitor the SAS PHY status, typing “Phyinfo” or “sys hdd” to check. Users can check the disk link status by using these commands.

```
COM15:115200baud - Tera Term VT
File Edit Setup Control Window Help

bpP >phyinfo

          SSSSSS
PHY  DEU  PHY  STMSIMA
ID   TYPE NLR  CNG  PPPPPPT ATTACHED SAS ADDR ROUTE ZONE  ZONE  Bay  CONN  CONN  CONN  MAP  EE
      TYPE NLR  CNG  IITTTA          TYPE GRP  CTRL  No.  TYPE  ELEM  PHY  PHY  FR
                                TYPE  BUS  No.  TYPE  INDX  LINK ID  BL

00      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 016 --
01      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 017 --
02      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 018 --
03      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 019 --
04      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 020 --
05      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 021 --
06      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 022 --
07      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 023 --
08      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 024 --
09      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 025 --
10      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 026 --
11      0x0 0x01 ----- T  0x01 0x04 ---- 0x00 ---- 0x00 027 --
12  END  12G 0x03 -----1 5B0BD6D1_A3011100 D  0x01 0x04 00 0x20 00 0x00 000 11
13  END  12G 0x03 -----1 5B0BD6D1_A3011101 D  0x01 0x04 01 0x20 01 0x00 001 11
14  END  12G 0x03 -----1 5B0BD6D1_A3011102 D  0x01 0x04 02 0x20 02 0x00 002 11
15  END  12G 0x03 -----1 5B0BD6D1_A3011103 D  0x01 0x04 03 0x20 03 0x00 003 11
16      0x0 0x01 ----- D  0x01 0x04 04 0x20 04 0x00 004 11
17      0x0 0x01 ----- D  0x01 0x04 05 0x20 05 0x00 005 11
18      0x0 0x01 ----- D  0x01 0x04 06 0x20 06 0x00 006 11
19      0x0 0x01 ----- D  0x01 0x04 07 0x20 07 0x00 007 11
20      0x0 0x01 ----- D  0x01 0x04 08 0x20 08 0x00 008 11
21      0x0 0x01 ----- D  0x01 0x04 09 0x20 09 0x00 009 11
22      0x0 0x01 ----- D  0x01 0x04 10 0x20 10 0x00 010 11
23      0x0 0x01 ----- D  0x01 0x04 11 0x20 11 0x00 011 11
24      0x1 0x01 ----- D  0x01 0x04 ---- 0x00 ---- 0x00 012 --
25      0x1 0x01 ----- D  0x01 0x04 ---- 0x00 ---- 0x00 013 --
26      0x1 0x01 ----- D  0x01 0x04 ---- 0x00 ---- 0x00 014 --
27      0x1 0x01 ----- D  0x01 0x04 ---- 0x00 ---- 0x00 015 --
SXP0 END  12G 0x01 --11---- 5B0BD6D1_A301113D D  0x01 0x04 ---- 0x2F 12 0x00 028
SXP1 END  12G 0x01 1----1- 5B0BD6D1_A301113F D  0x01 0x04 ---- 0x2F 13 0x00 029
SXP2      0x0 0x00 ----- D  0x01 0x04 ---- 0x00 ---- 0x00 030

Expander Change Count: 0027
Zone Configuring: 0
Self Configuring: 0
Configuring: 0
```

```
bpP >sys hdd

Phy  SAS Address      Link Speed  Device Type  Status
1 12 5B0BD6D1_A3011100 6G          END         OK
2 13 5B0BD6D1_A3011101 6G          END         OK
3 14 5B0BD6D1_A3011102 6G          END         OK
4 15 5B0BD6D1_A3011103 6G          END         OK
5 16      0x0          0x0          Not Installed
6 17      0x0          0x0          Not Installed
7 18      0x0          0x0          Not Installed
8 19      0x0          0x0          Not Installed
9 20      0x0          0x0          Not Installed
10 21      0x0          0x0          Not Installed
11 22      0x0          0x0          Not Installed
12 23      0x0          0x0          Not Installed

bpP >
```

4.2.5 Firmware Update

In some occasions, when required, users can update expander firmware through UART port via Xmodem protocol.

*** Firmware upgrade is risky and is not recommended to conduct by users unless there is technical support people onsite.**

There are 2 firmware for expander. Be sure these binary files are available in the host before conducting firmware update.

1. SAS Expander Operation Firmware
2. SAS Expander MFG CFG binary

The updated firmware does not take effect until a reset (either system reboot or reset expander via CLI command – “reset”).

4.2.5.1 SAS Expander Operation Firmware Update

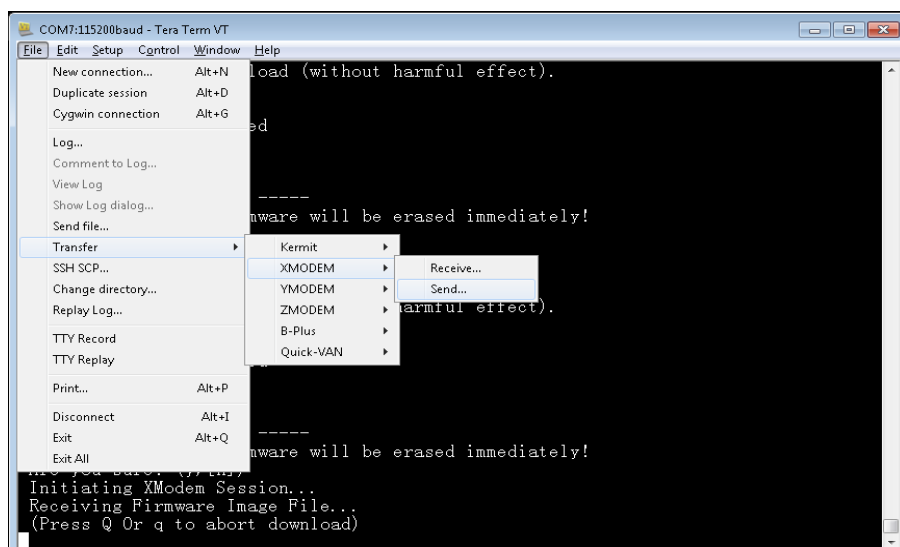
- A. “fwdl” command on terminal
- B. Type “y” to commit firmware upgrade.

```

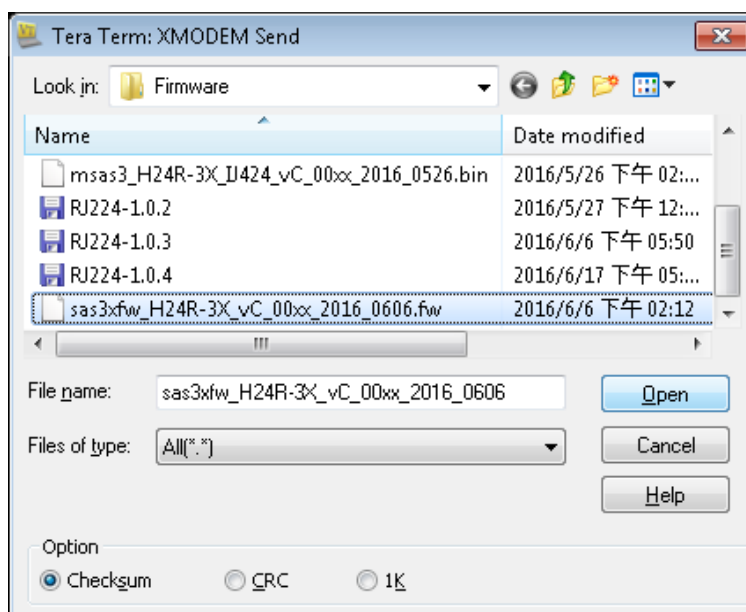
bhpP >fwdl

----- Firmware Update -----
Backup version of firmware will be erased immediately!
Are you sure? <y/[n]>
Initiating XModem Session...
Receiving Firmware Image File...
(Press Q Or q to abort download)
  
```

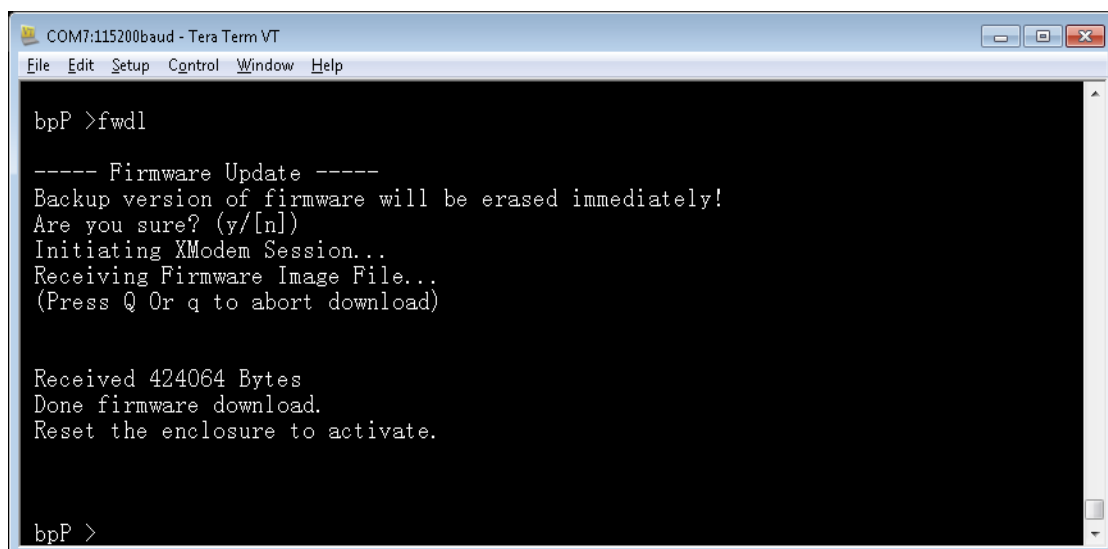
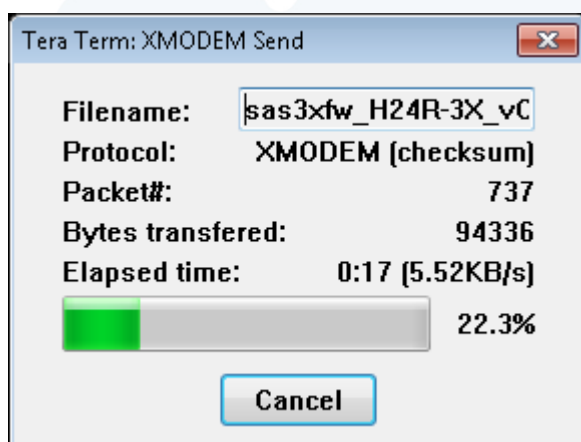
- C. Select xmodem as the protocol to transfer file.



- D. Select the correct SAS Expander firmware file.
- E. Click on “Open” to start the selected firmware transferring to SAS Expander.



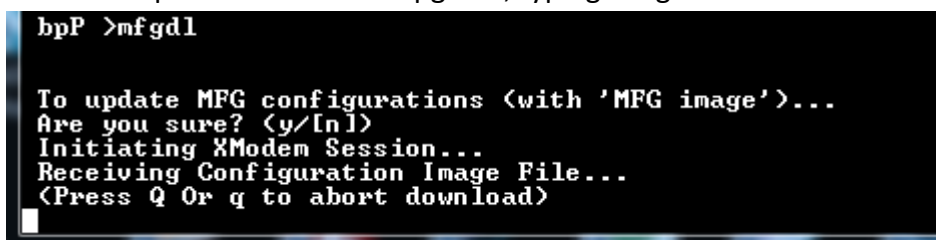
- F. Terminal would then start firmware transfer.



- G. After firmware transfer completed, typing 'reset' command in terminal or power cycling system to activate new firmware.

4.2.5.2 SAS Expander MFG CFG Binary Update

- A. Similar to operation firmware upgrade, typing "mfgdl" on console.



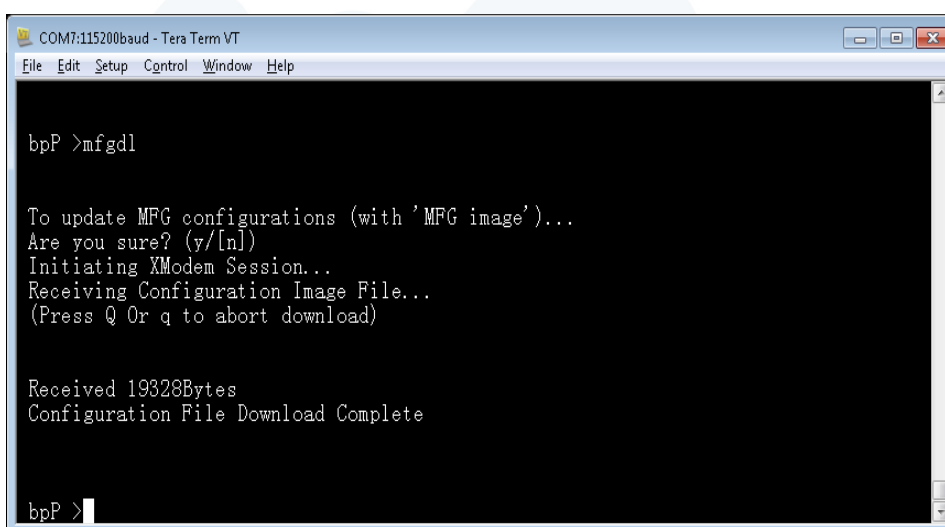
```

bpP >mfgdl

To update MFG configurations (with 'MFG image')...
Are you sure? (y/[n])
Initiating XModem Session...
Receiving Configuration Image File...
(Press Q Or q to abort download)

```

- B. Type "y" to commit MFG file upgrade.
- C. Select xmodem as the file transfer protocol.
- D. Select the correct MFG CFG file from file browser.
- E. Click "Open" to start file transfer.
- F. Terminal would then start file transfer.



```

COM7:115200baud - Tera Term VT
File Edit Setup Control Window Help

bpP >mfgdl

To update MFG configurations (with 'MFG image')...
Are you sure? (y/[n])
Initiating XModem Session...
Receiving Configuration Image File...
(Press Q Or q to abort download)

Received 19328Bytes
Configuration File Download Complete

bpP >

```

- G. After firmware transfer completed, typing 'reset' command in terminal or power cycling system to activate new firmware.

5 Compatibility Lists

To reach best performance and avoid system failure, In Win strongly recommend users choosing the components from In Win's compatibility list. All the components are tested in In Win's lab and assured the components are working well with In Win's chassis.

You can download the latest updated device compatibility list from In Win's website:

<https://www.in-win.com/en/ipc-server>

6 Q&A

Section 1: Expander

1. What is the In Win Expander's function?

A: The expansion the capacity, the expander can manage more SAS drives via one SAS cable in the JBOD.

2. Why IW-RS series storage server chassis are built-in expander board, and IW-RJ series JBOD enclosures uses expander module?

A: IW-RS chassis needs a motherboard to compose a system, the expander board can work seamlessly with motherboard to manager the drives. Different from the chassis, IW-RJ JBOD enclosure use hot swap expander modules to satisfy the requirement of both capacity expansion and JBOD redundancy.

3. Why IW-RJ JBOD enclosure needs 2 expander modules?

A: It is for redundancy. If user does not need this function, single expander module also works out.

4. What are the functions of the three connector ports on the expander module?

A: SAS 0 is the connecting port to Server 0/ RAID or HBA 0, SAS 1/ RAID or HBA 1 is to Server 1; EXP is the port to cascade another JBOD to expand the capacity.

5. Can I add more ports to the expander module?

A: First of all, we have to understand that the ports are for cable connecting. Second, as only as the Phy quantity of the expander chip set allows, technically, this configuration works out. Yet, we also need to consider about the technical alignment. For example, an expander with a 3x36R chipset has totally 36 Phy, and each ports consumes 4 Phy; thus, we can design a 9-port expander ($36/4 = 9$) to connect 9 cable. However, once we use out all the Phy for connecting, we have no remaining Phy to connect HDD, this design will goes meaningless.

6. Once I find the expander is failure, what can I do?

A: IW-RS series: Power off the system, and make sure the system is totally shut down. Unplug the SAS cable to replace the expander board.

IW-RJ series: Remove the failure expander module, and replace a new expander module.

Section 2: Hard Disk

7. What is the different between SAS and SATA disk, and how to choose?

A: SATA has only one throughput channel for data transmission, SAS has two. Once the system is designed with redundant function, SAS disk provides performance and reliability. SATA provide a choice of cost selective option.

8. Are SAS and SATA disks are compatible with both In Win IW-RS series and IW-RJ series?

A: Yes, In Win IW-RS and IW-RJ support both SAS and SATA disks.

9. Can I populate 2.5" disks to the 3.5" tray-less slots?

A: 3.5" tray-less slot does not support 2.5" disks at this moment, if this requirement is mandatory, please contact In Win sales for OEM service.

10. Is the storage server or JBOD must be full populated to work?

A: No, you can populate partial bays and start the system. Once you need more storage space in the future, then add more disks.

11. Can I populate both SAS and SATA disks in an enclosure?

A: Yes, it works. However, you may need to consider about the alignment issue.

12. If my system drive is failure, can I replace the drive without shutting down the system?

A: In default, IW-RS series' two internal disks doesn't support hot-swap feature. You can order an optional 2bay hot-swap system disk module to reach your purpose.

Section 3: RAID/ Cascade

13. Is RAID card a requirement component for composing a RAID system?

A: If your motherboard featured on-board RAID function, or your OS support software RAID, you do not need a RAID card. For technical details, please contact your motherboard or software vendor.

14. How many units can IW-RJ series JBOD cascade?

A: In maximum, a daisy chain can stripe 48 disks.

15. If I would like to cascade the JBOD, what components do I need?

A: You will need a SFF-8644 to SFF-8644 SAS cable, which meets T10 standard. And the length we suggest less than 3M to reach the best performance.

16. If I only have an internal RAID controller card, and I would like to expand the capacity, how to add more disks?

A: IW-RJ series JBOD is for this purpose. If your RAID controller card does not have external connecting port, you can use a SFF-8643 to SFF-8644 adaptor cable to connect the JBOD enclosure.

Section 4: Others

17. Why PSU has two modules? What are these two modules for?

A: Two PSU modules are for redundancy, if you need this function, PSU with two modules is required.

18. Can I add or reduce the quantity of fans?

A: The quantity of fan is related to the radiating efficiency. Usually, the quantity of fans depends on the system loading and the heat generation. Unless you have tested, or we strong recommend not to change the default fans quantity.

19. Which parts support hot-swap feature.

A: IW-RS storage server: Fans, PSU, HDD

IW-RJ JBOD enclosure: Fans, PSU, Expander Modules, HDD

20. Can 12Gb SAS ports compatible with 6Gb SAS or 6Gb SATA ports? Any adaptor can convert?

A: 12Gb SAS does not align with 6Gb SAS, so In Win does not have adaptor for this case.

21. If the arm or handle is broken, how can I fix or replace it?

A: Please contact your local In Win partner, or support contact for replacing and repair service.

22. If I would like to modify the GUI, how can I access.

A: The copyright of the GUI is belonging to In Win. If you would like to amend anything of the GUI, please contact In Win sales for ODM service.



7 Technical Support

If you need help on installation or troubleshooting, you can contact your local In Win partner, or send email to In Win's local contact for technical assistance.

