



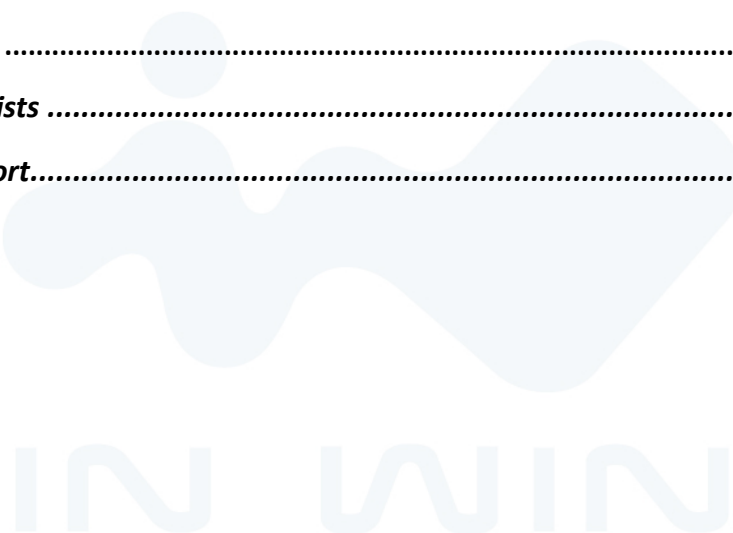
# IW-RJ460-05

## User's Manual

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## PREFACE

Thank you for choosing the InWin IW-RJ460-05. 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 on adding and removing components on the InWin IW-RJ460-05. For the latest version of this manual, you may visit InWin's server website to download the latest updated version.

## SAFETY INFORMATION

To ensure a safe and smooth operation of your InWin IW-RJ460-05, it is essential that you choose an appropriate location for the system, provide an appropriate operating environment and supply an adequate amount 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 a qualified technician.

**Environment selection:** The system is designed to operate in a typical office environment:

- The location should be clean, dry and free of airborne particles.
- It should be situated in a well-ventilated room, and away from sources of heat including direct sunlight and radiators.
- It should be kept away from sources of vibration or physical shock.
- The space should be accommodated with a properly grounded wall outlet, and with sufficient space to access the power supply cords.
- The operating environment temperature should be around 0°C to 40°C (32°F to 104°F).

**Heed safety instructions:** Before working with InWin IPC/Storage server products, we strongly recommend you use 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 regulators may not comply 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 the system, you must unplug the AC power cord from the outlet or the system's power supply units. Make sure the power cord is unplugged before you open the chassis or add/remove any components.

**Hazardous conditions, devices and cables:** Hazardous electrical conditions can be present on/in power supply units and their cables. Disconnect the power cord and any other device attached to the server before opening the case. Failing to follow safety procedures will increase the risk of personal injury or equipment damage.

**Electrostatic discharge (ESD) and ESD protection:** In most cases, ESD may damage disk drives, electronic boards and other parts. We recommend that you conduct installation only at an ESD free space. If not possible, perform ESD protection protocol by wearing anti-static wrist straps attached to the ground on any unpainted metal surface on your server during operation.

**Installing or removing jumpers:** A jumper is a short length conductor used to close, open or bypass part of an electronic circuit. Jumpers on InWin backplanes 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, grip the jumper and carefully pull without squeezing.

## CAUTION

To avoid damage and maintain your safety, please read the following terms listed below:



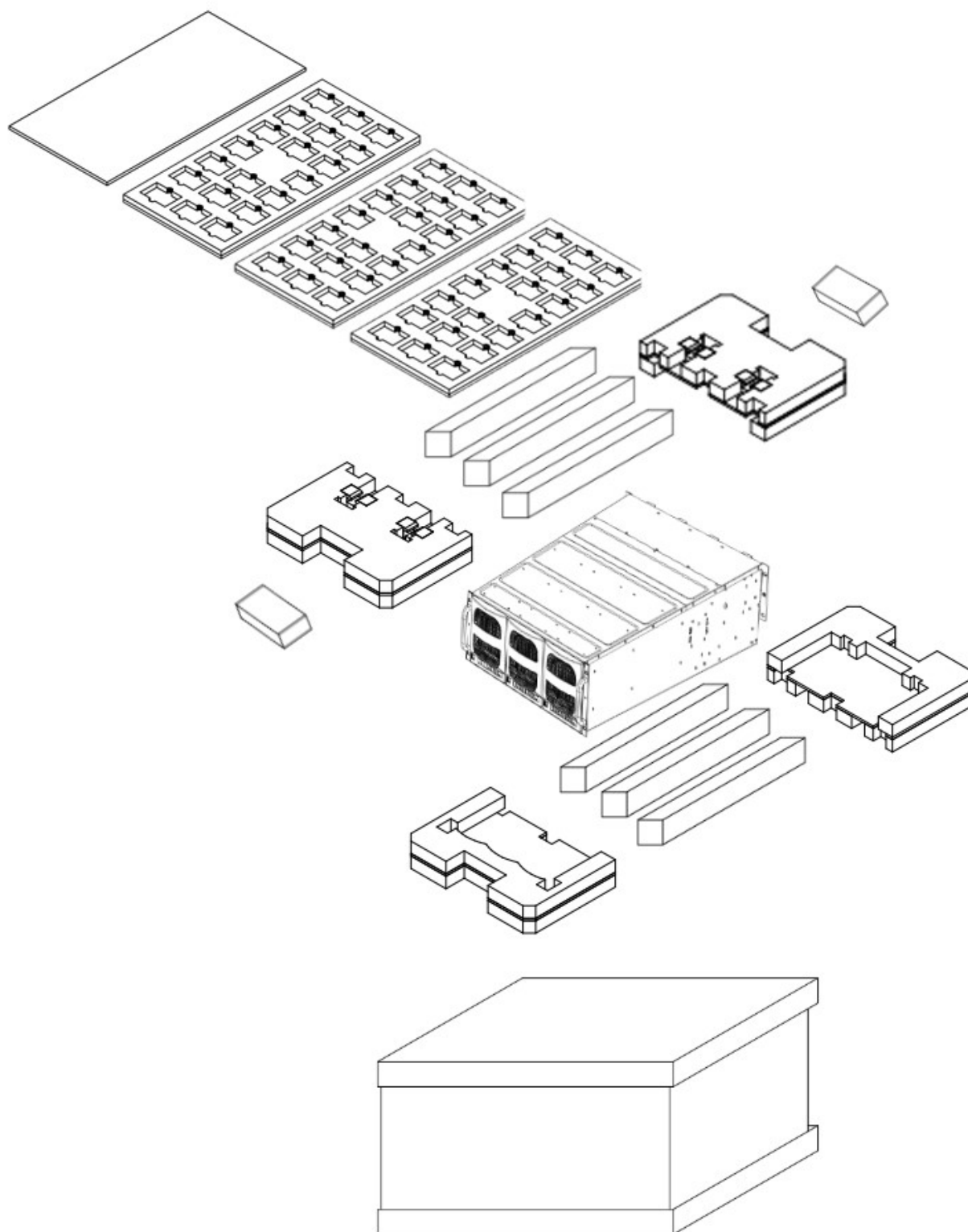
1. Do not populate hard drives and turn on the power until the system has stabilized.  
Make sure hard drives and other components are properly connected before turning on the system.
2. Tighten or loosen all screws with a screwdriver.
3. Apply the correct screws packed in the accessory box.
4. For your safety, please have at least two people lift and place the unit in its designated area.
5. Before mounting the unit to the cabinet, make sure the rail is installed correctly.
6. When installing and removing any module or part, please use the handles.

## SPECIFICATIONS

|                                                 |                                                                                                                                                    |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model Name</b>                               | <b>IW-RJ460-05</b>                                                                                                                                 |
| <b>Standard</b>                                 | EIA-RS310D                                                                                                                                         |
| <b>Dimensions (D x W x H)</b><br>w/o Front Door | 812.8 x 482.6 x 176 mm (32" x 19" x 7")                                                                                                            |
| <b>Storage</b>                                  | External: Hot-swap 3.5" x 60 (SAS 12Gb/s, 20 bays per drawer)                                                                                      |
| <b>Power Supply</b>                             | Supports <ul style="list-style-type: none"> <li>▪ Form Factor: Platinum CRPS redundant with PDB cable management</li> <li>▪ Watt: 1200W</li> </ul> |
| <b>Cooling Fan</b>                              | 97 x 33 mm PWM blower x 6                                                                                                                          |
| <b>12G Expander Module</b>                      | 1 or 2                                                                                                                                             |
| <b>Host/Expansion Port</b>                      | 8 x Mini SAS HD (SFF-8644) for each 12G expander module                                                                                            |
| <b>Management</b>                               | Smart fan, thermal monitor, HDD monitor, voltage monitor, alarm warning                                                                            |
| <b>SES</b>                                      | Supports SES-2 (SCSI Enclosure Service)                                                                                                            |
| <b>Maintenance</b>                              | Supports management by Ethernet (Optional) and RS-232                                                                                              |
| <b>HDD Power Management</b>                     | HDD sequential power on                                                                                                                            |
| <b>Temperature</b>                              | 0°C to 35°C                                                                                                                                        |
| <b>Material</b>                                 | Material: SGCC<br>Thickness: 1.0 mm                                                                                                                |
| <b>Rail Kit</b>                                 | Fixed rail blade                                                                                                                                   |

\* The actual product is subject to change without prior notice. In Win Development Inc. reserves the right to make any final modifications.

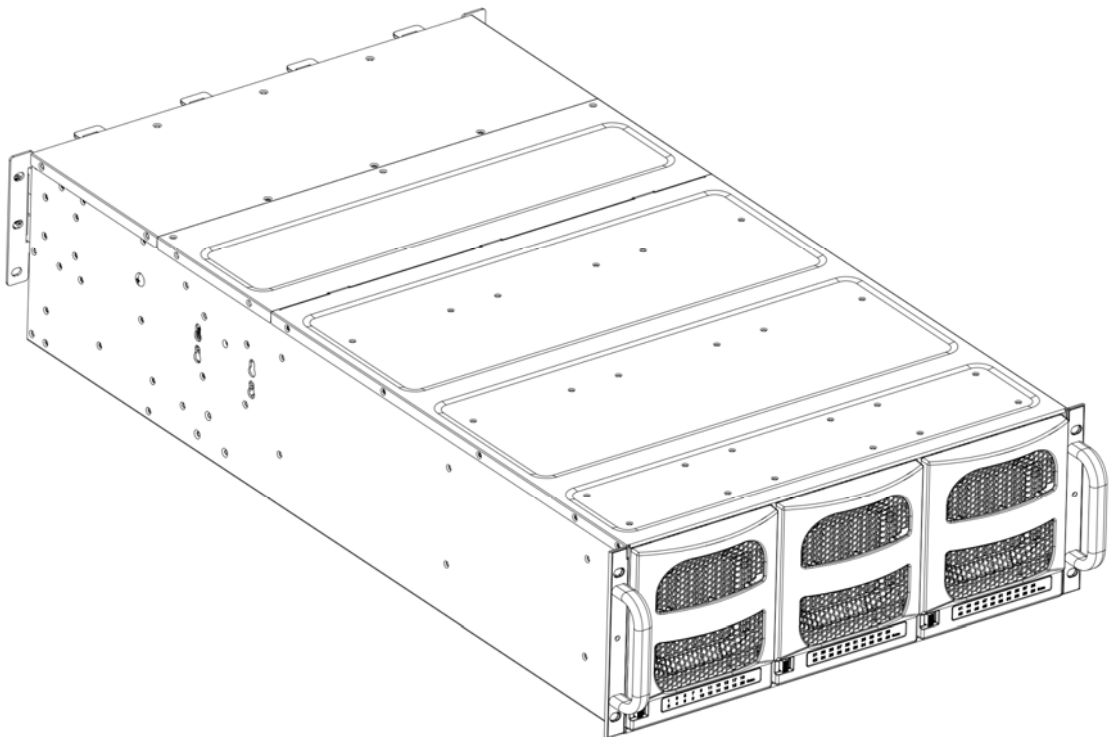
## 1.1 Box Contents



## 1.2 General Information

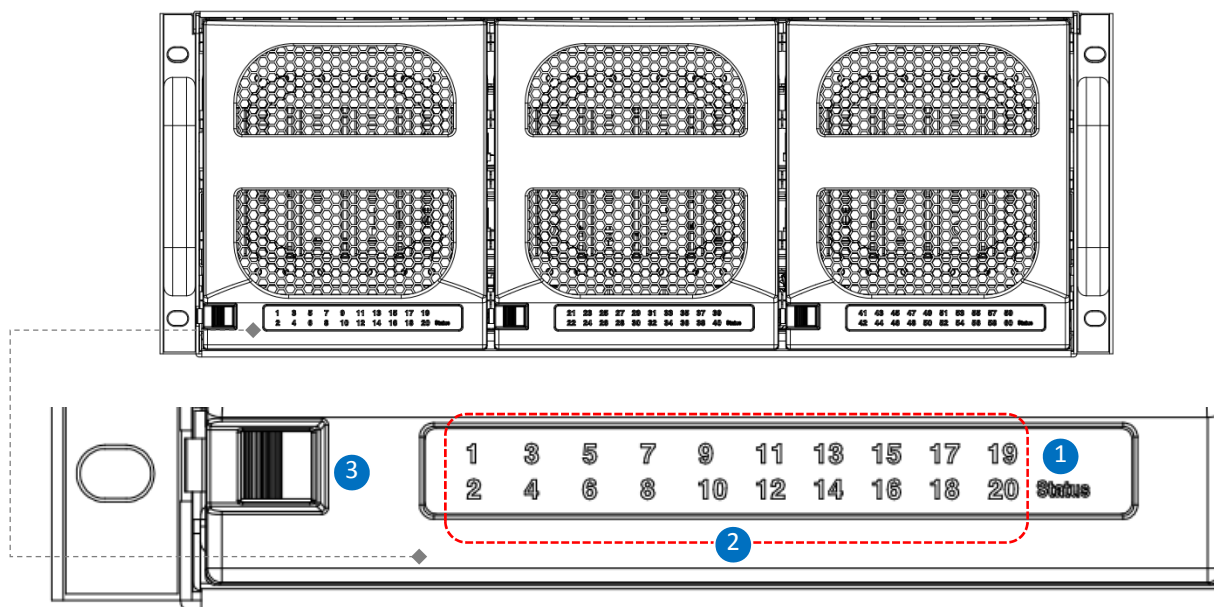
IW-RJ460-05 JBOD enclosure is a high density 4U rackmount storage chassis with 60 tool-less bays, dual expander modules, six blower fan modules, and dual 1200W Platinum-level CRPS power supply modules for 1+1 redundancy.

Opposing HDD bays designed to offset torques and minimizes rotational vibration aggregation and supports the GUI via an Ethernet board (optional).



### 1.2.1 Front Panel Controls and Indicators

The front panel includes control buttons and LED indicators.



| No. | Name               | Color                  | Status | Description          |
|-----|--------------------|------------------------|--------|----------------------|
| 1   | System Status LED  | Follow the table below |        |                      |
| 2   | Drive Status LED   |                        |        |                      |
| 3   | Drive Module Latch | -                      | -      | Opens the HDD drawer |

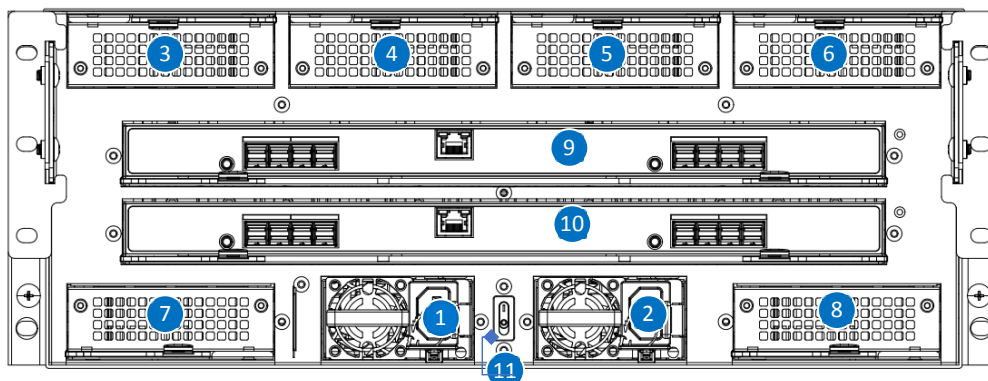
#### Drive Status LED:

- (Solid) Drive Online
- (Blinks) Drive Activity
- (Solid) Drive Failed
- Drive Offline / Removed

#### System Status LED:

- System Normal
- System Degraded

## 1.2.2 Rear Panel Configuration



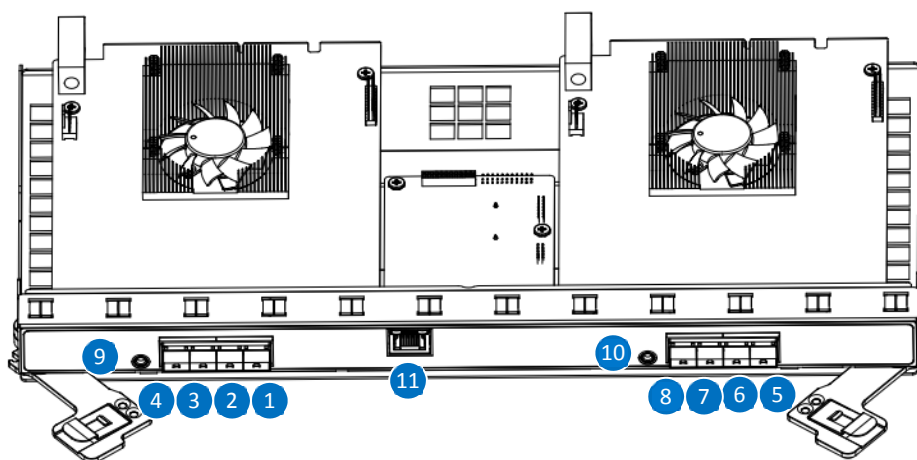
| No. | Item           |
|-----|----------------|
| 1   | Power Module 1 |
| 2   | Power Module 2 |
| 3   | Fan Module 1   |
| 4   | Fan Module 2   |
| 5   | Fan Module 3   |
| 6   | Fan Module 4   |

| No. | Item                      |
|-----|---------------------------|
| 7   | Fan Module 5              |
| 8   | Fan Module 6              |
| 9   | Secondary Expander Module |
| 10  | Primary Expander Module   |
| 11  | Power On/Off Button       |

### PSU Status LED:

-  Power Standby
-  Power On
-  Loss of Power

### 1.2.3 Expander Configuration



| No. | Name                            | Description                                      |
|-----|---------------------------------|--------------------------------------------------|
| 1   | SAS Up Link1 (HDD 1-30)         | Host HBA/RAID card connection                    |
| 2   | SAS Up Link2 (HDD 1-30)         | Host HBA/RAID card connection                    |
| 3   | SAS Down Link1(HDD 1-30)        | External cascading                               |
| 4   | SAS Down Link2(HDD 1-30)        | External cascading                               |
| 5   | SAS Up Link1 (HDD 31-60)        | Host HBA/RAID card connection                    |
| 6   | SAS Up Link2 (HDD 31-60)        | Host HBA/RAID card connection                    |
| 7   | SAS Down Link1 (HDD 31-60)      | External cascading                               |
| 8   | SAS Down Link2 (HDD 31-60)      | External cascading                               |
| 9   | Expander A Serial Port (RS-232) | RS-232 Support                                   |
| 10  | Expander B Serial Port (RS-232) | RS-232 Support                                   |
| 11  | Management Ethernet Port        | Connect to Ethernet remote monitoring (optional) |

## 2 Hardware Installation

### 2.1 Removing and Installing a Hard Drive

IW-RJ460-05 JBOD features tool-less trays. Users no longer need to use screws to mount disks and can swap drives faster. The HDD drawer features a two-level sliding design for easy maintenance.

#### 2.1.1 Installing a Hard Drive

Step 1: Press the front latch to the right. Hold the groove under the HDD drawer and pull the drawer outwards until it clicks.

##### \* Opening the rear drive bay of the hard drive drawer

Press the release button on the back of the bottom of the HDD drawer. Hold the groove again and slide the drawer outward until it clicks.

Step 2: Release the latch to open the disk tray cover. Hold the cover and pull the tray up until it clicks into place.

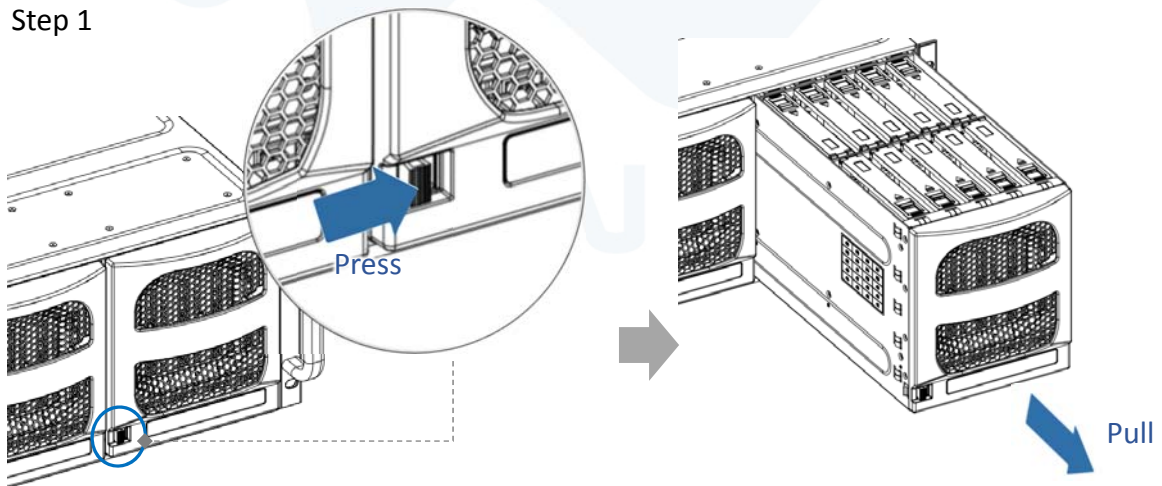
Step 3: Fully insert the HDD into the tray from the correct disk port orientation. Align the HDD screw holes and plug in the pins on both sides of the tray. Keep the tray pins against the HDD screw holes and push the disk tray back to the location.

Step 4: Close the cover to lock. Press the release button on the back of the bottom of the HDD drawer and push the HDD drawer back.

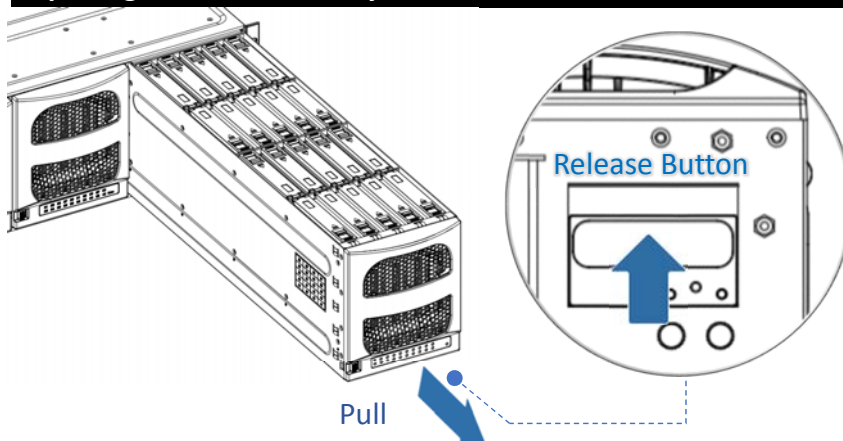
##### \* Closing the rear drive bay of the hard drive drawer

Press the release button on the back of the bottom of the HDD drawer. Push and slide the drawer into the enclosure until it clicks.

Step 1

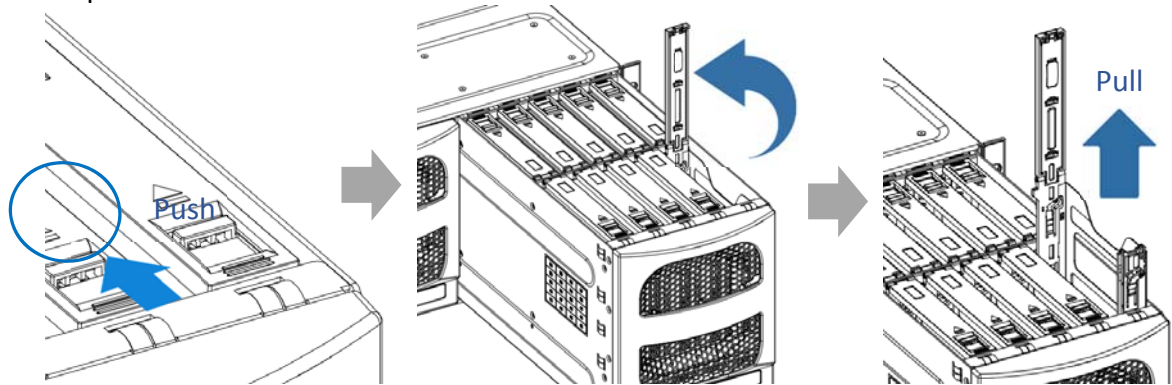


#### Opening the rear drive bay of the hard drive drawer



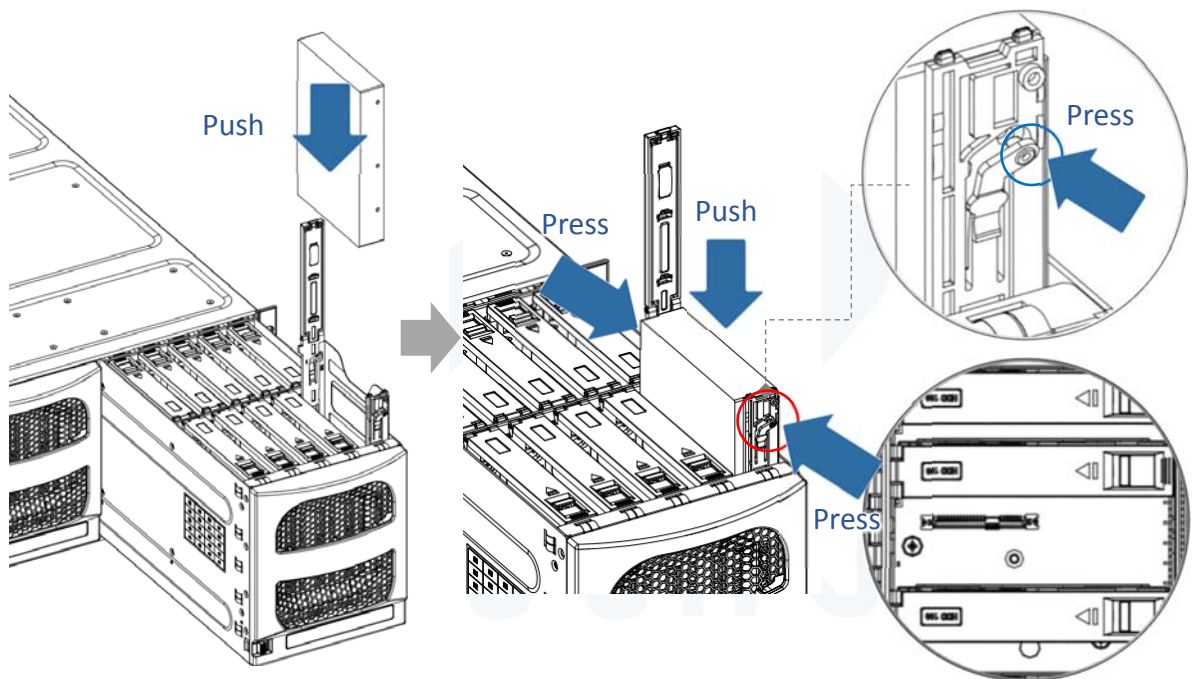
When maintaining the rear drive bay of the hard drive drawer, open the hard drive drawer even further.

## Step 2



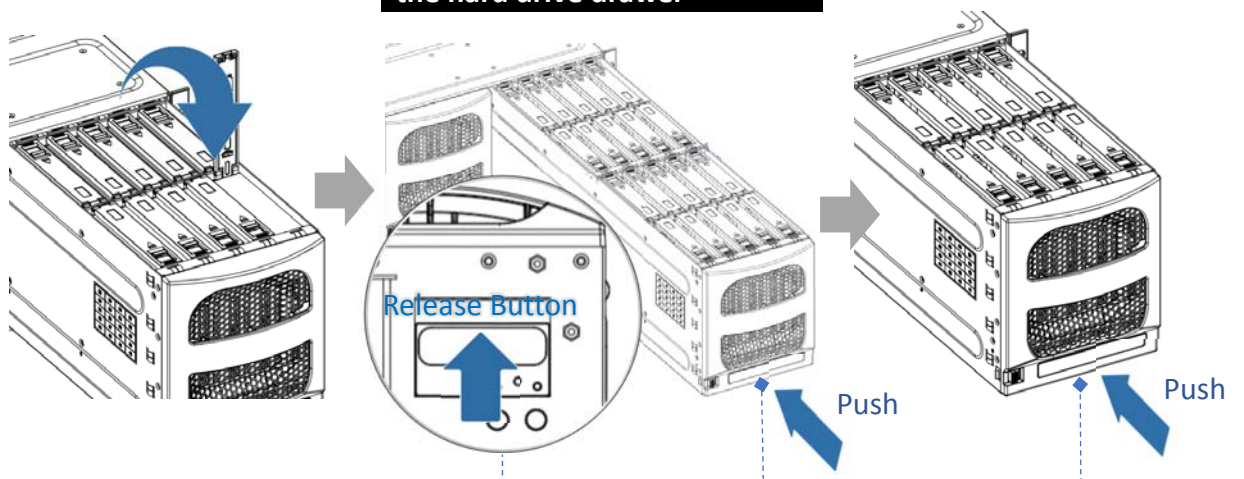
Loosen the latch in the direction of the arrow.

## Step 3



## Step 4

**Closing the rear drive bay of the hard drive drawer**



### 2.1.2 Removing a Hard Drive

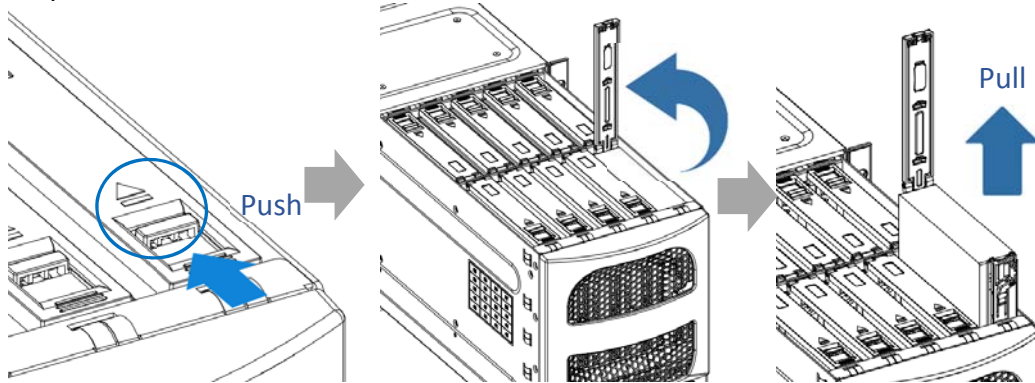
Step 1: Open the drive bay of the hard drive drawer. (Refer step 1 in 2.1.1)

Step 2: Release the latch to open the disk tray cover. Hold the cover and pull the tray up until it clicks into place. Then, remove the HDD carefully.

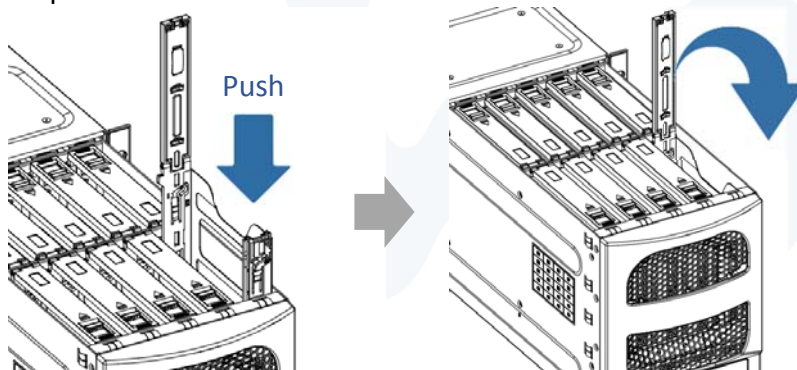
Step 3: Lower the disk tray back and close the cover to lock.

Step 4: Close the drive bay of the hard drive drawer. (Refer step 4 in 2.1.1)

Step 2



Step 3



## 2.2 Removing and Installing the Fan Module

The IW-RJ460-05 JBOD has built-in fan modules that support hot-swappable and redundant features, which is easy to maintain with the tool-less design.

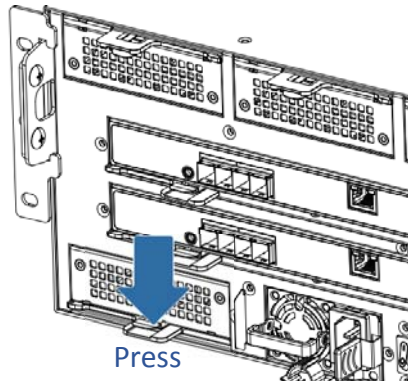
### 2.2.1 Removing the Fan Module

Step 1: Press the clip to release the lever of the fan module.

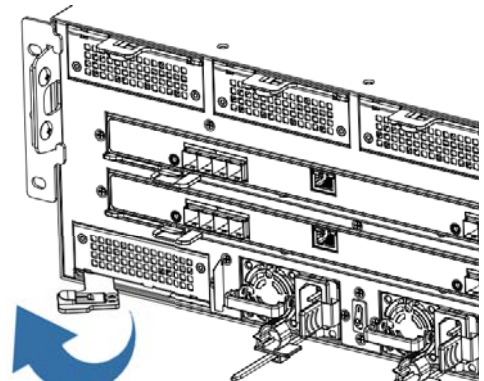
Step 2: Rotate the fan module lever outward.

Step 3: Pull out the fan module.

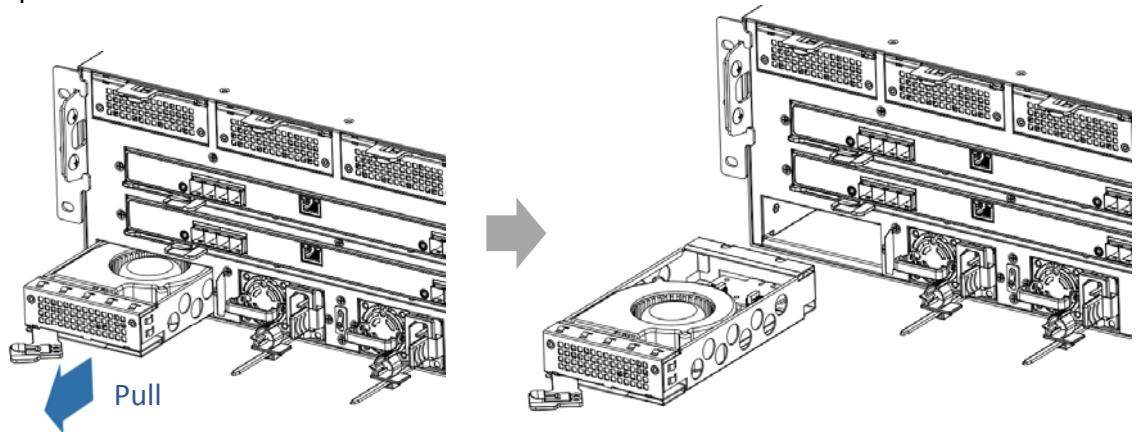
Step 1



Step 2



### Step 3

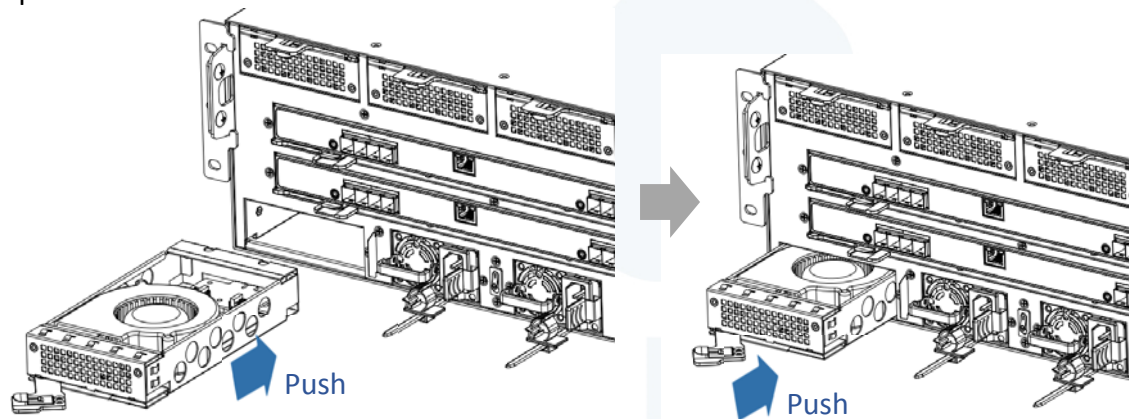


## 2.2.2 Installing the Fan Module

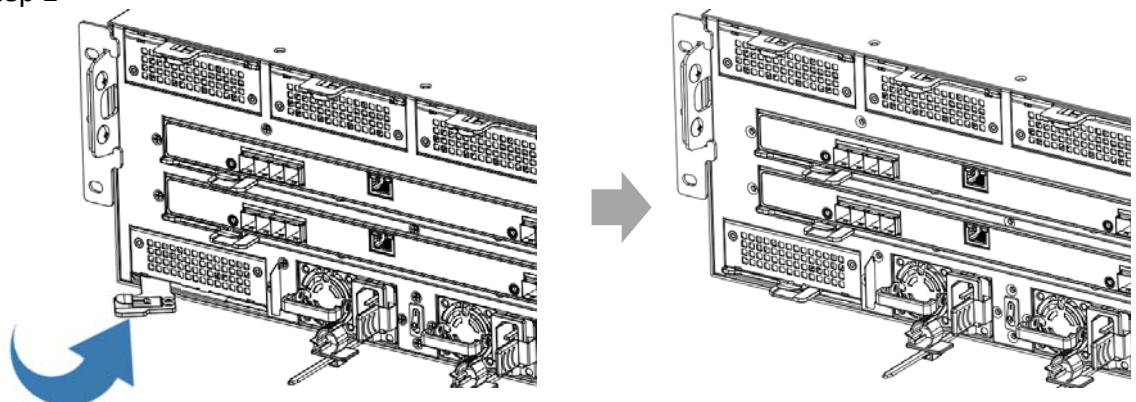
Step 1: Push the fan module back into the slot.

Step 2: Rotate the fan module lever inward until it clicks and connect the fan to the backplane.

### Step 1



### Step 2



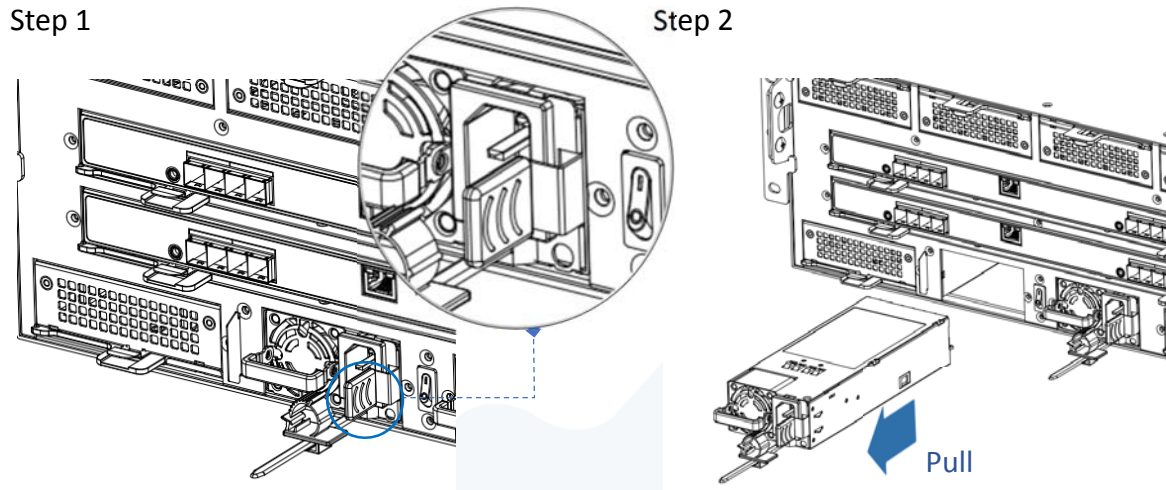
## 2.3 Removing and Installing the PSU Module

The IW-RJ460-05 hosts dual built-in redundant power supply module. With this function, the system is capable of still functioning if one of the modules fail. To replace it, the user only needs to release the failed module, then insert a functional module.

### 2.3.1 Removing the PSU Module

Step 1: Press the release tab of the power supply unit's module at the back.

Step 2: Pull the module out using the handle.

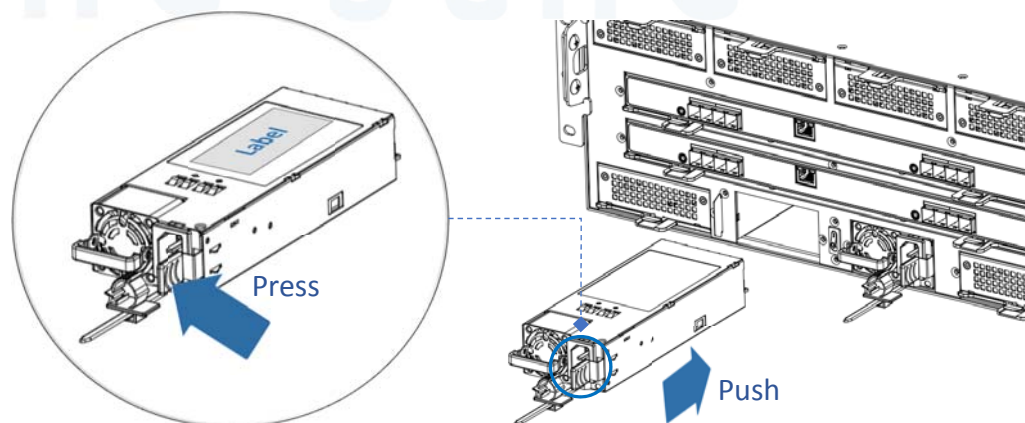


### 2.3.2 Installing the PSU Module

Step 1: Press the release tab of the power supply unit's module at the back.

Step 2: Push the module into the enclosure using the handle.

Step 1~2



**NOTE:** 1. This unit supports InWin PSU modules only, please do not attempt to insert any other module brands.  
2. The two PSU modules' output wattage must be the same.

## 2.4 Removing and Installing the Expander Module

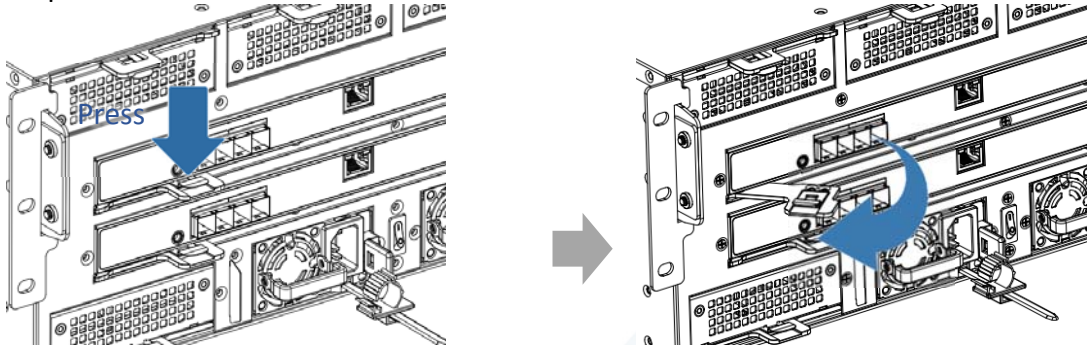
InWin IW-RJ460-05 JBOD contains dual set of redundant expander modules. The bottom module is the primary expander, while the upper is the secondary. The expander module includes an Ethernet management module, which allow users to monitor and manage the system through Ethernet. Also, the redundant module can minimize downtime should any on the expanders fail.

### 2.4.1 Removing the Expander Module

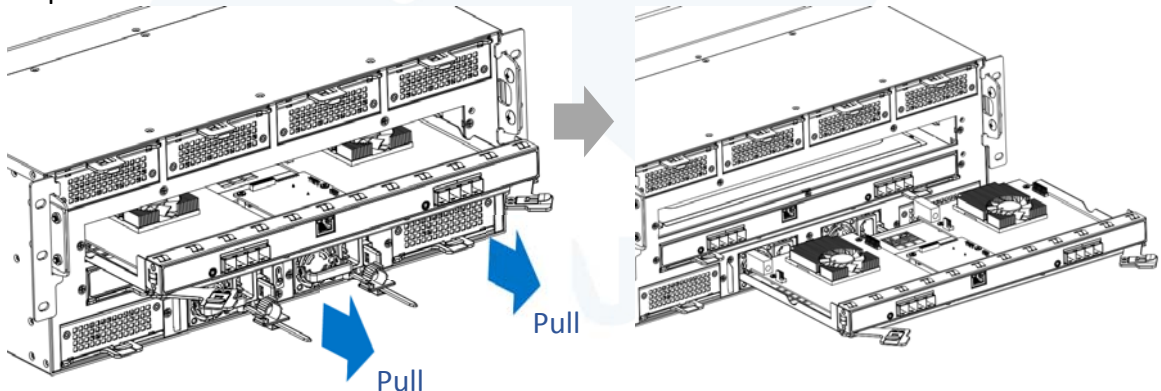
Step 1: Press the expander module clip and rotate the handle outward.

Step 2: Pull out the expander module.

Step 1



Step 2

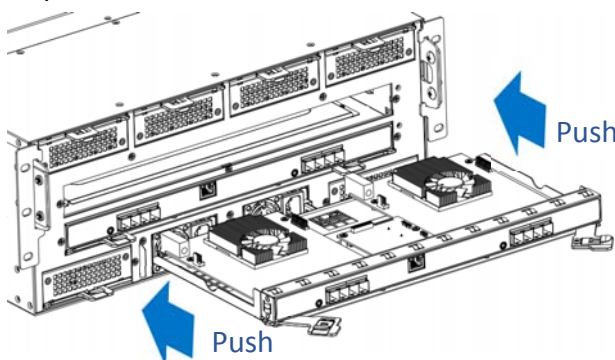


### 2.4.2 Installing the Expander Module

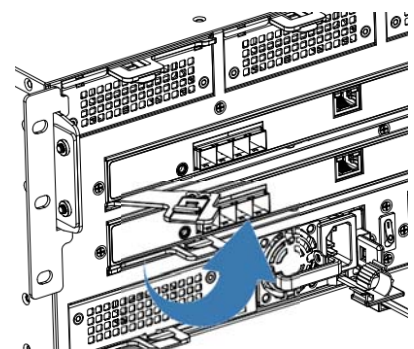
Step 1: Push the expander module into the cage until it clicks back to the original location.

Step 2: Rotate the lever back into position.

Step 1



Step 2



## 2.5 Rail Installation

The IW-RJ460-05 JBOD is a high density 4U rackmount storage model, which supports EIA-RS310D standard cabinets and chassis racks. InWin provides standard fixed rail blades for mounting the RJ460-05 JBOD chassis to cabinets.

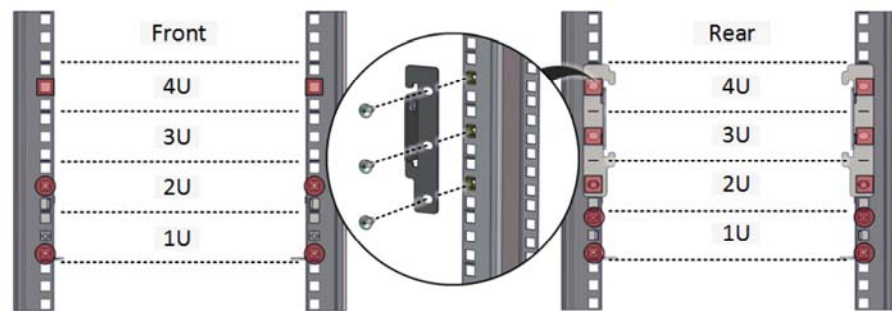
### 2.5.1 The Type of Rail Kit

Please follow the instructions to install the rails on the cabinet or chassis rack according to the rail type you ordered.

### 2.5.2 Fixed Rail Blades

#### 2.5.2.1 Installing the Support Bar to the Rack

Step 1: Align the stop bracket holes to the square nuts (red squares) of the rack posts. Tighten the brackets to the posts. (Red circles are locations for support bar screws.)

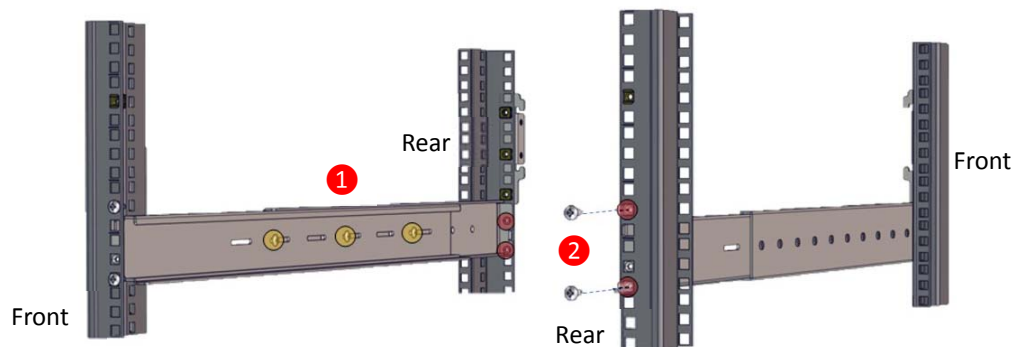


Step 2: Install the Support Bar to the rack.

Adjust the support bars to match the rack depth. Secure with M4x6L screws (yellow circles). Refer to figure ①.

Place the support bars to the rack and align the post holes on the rack. Secure with M5x10L screws (red circles). Refer to figure ②.

#### Install the Support Bar to the Rack



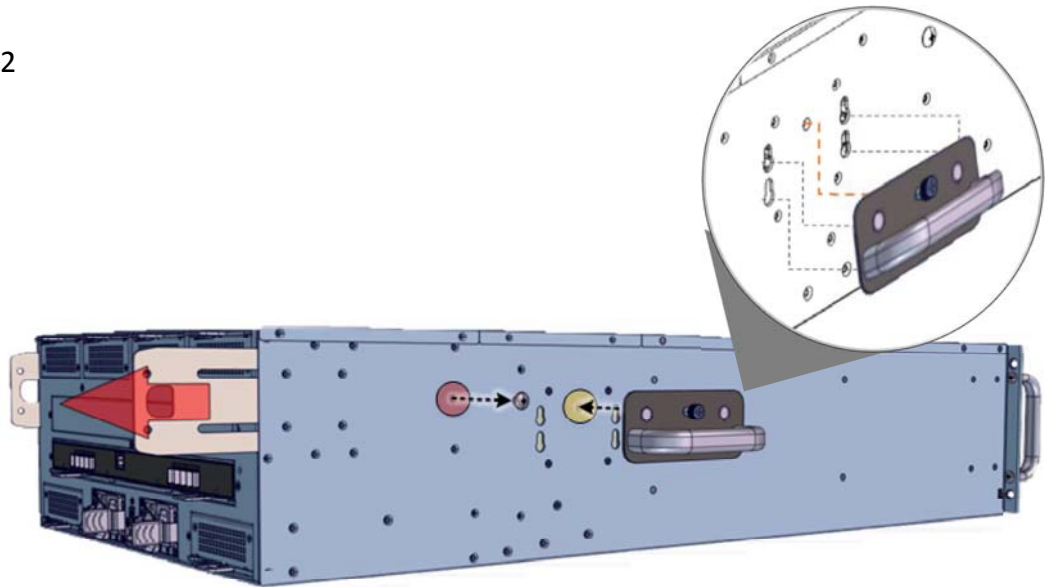
#### 2.5.2.2 Insert the Chassis to the Rack

Step 1: Remove the screw (red circle) and hold the fixed rail at the end of the chassis outward.

\* After mounting the fixed rail blades, tighten the screw (red circle).

Step 2: Place the removable handle rivets into the holes and move upward until it locks. Secure the thumbscrews.

Step 1~2



**Note: Heavy! Handle with Care!**

**Use and secure the removable handle rivets before transporting. At least two people are required for the following actions:**

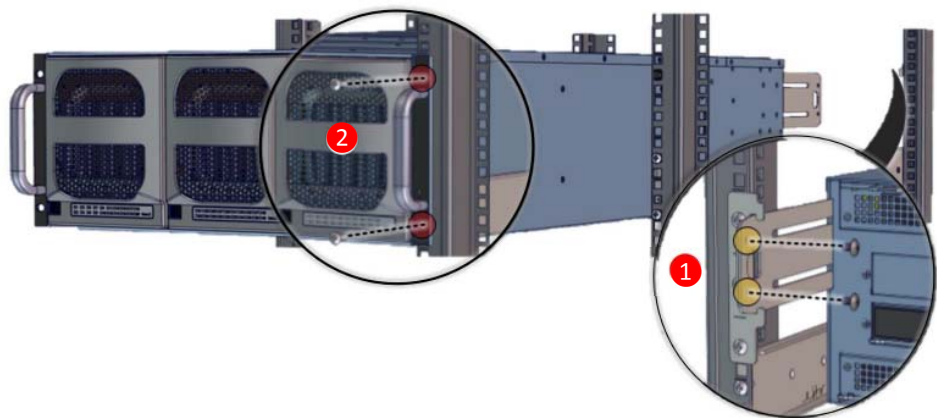
Step 3: Place the Unit to the Rack carefully.

Place the unit on the support bars and push it toward the rear of the cabinet.

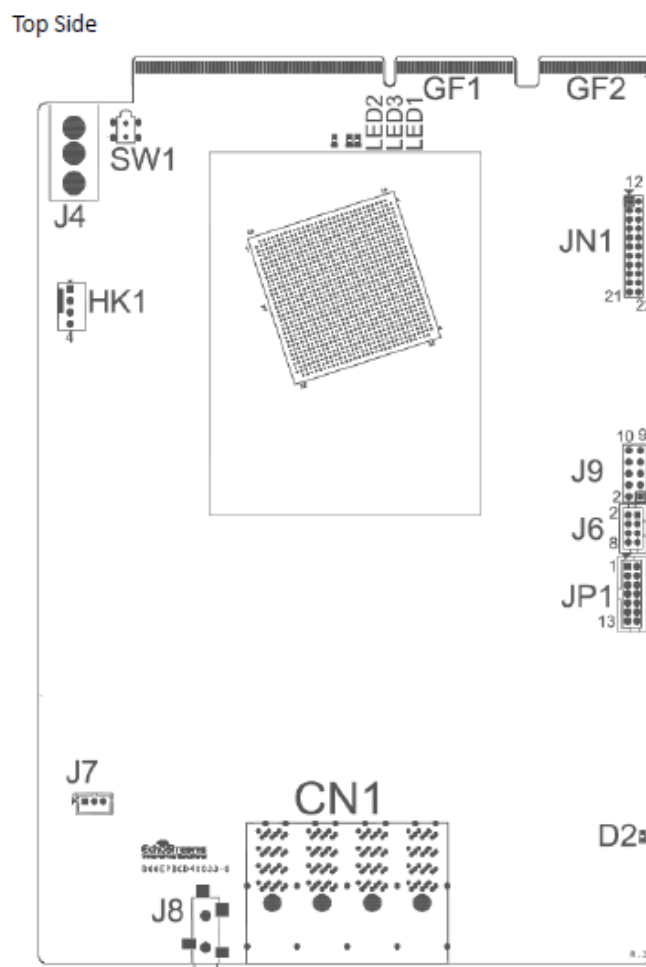
Step 4: Extend the fixed rail blades toward the rear rack. Align the stop bracket holes and secure with M5x10L screws (yellow circles).

Refer to figure ①.

Tighten the front ears (red circles) to the front rack with four M5x20L screws. Refer to figure ②.



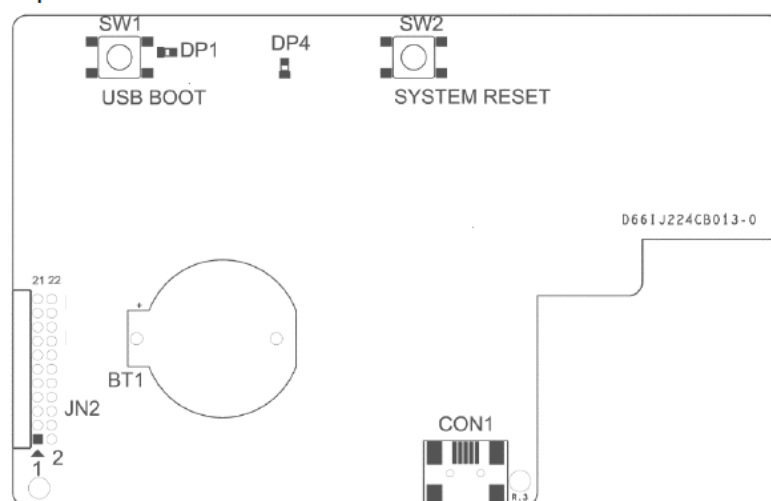
### 3 Expander Board Introduction



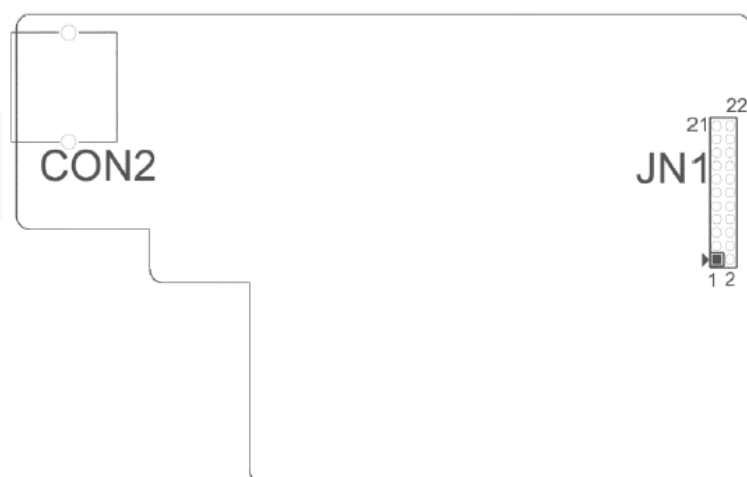
| Location | Description                       |
|----------|-----------------------------------|
| SW1      | 0.9V Reset                        |
| J4       | Guide Pin                         |
| HK1      | Fan Connector                     |
| JN1      | Ethernet card connector           |
| J9       | LED                               |
| J6       | I2C                               |
| JP1      | Programming port                  |
| J7       | Console port                      |
| J8       | Phone Jack Console port           |
| CN1      | Quad 8644 Mini-SAS HD UPLINK PORT |
| LED1     | GPIO                              |
| LED2     | GPIO                              |
| LED3     | Heartbeat                         |

## 4 Ethernet Management Card Introduction

Top Side



Bottom Side



| Location | Description    |
|----------|----------------|
| SW1      | USB Reboot     |
| SW2      | System Reset   |
| DP1      | Power LED      |
| DP4      | MCU Status LED |
| JN2      | UART Port      |
| CON1     | USB Port       |
| JN1      | UART Port      |
| CON2     | Ethernet Port  |

## 5 User Interface Introduction

### 5.1 Overview

InWin's JBOD System is a high performance, reliable storage system with sensors to monitor system health. We provide state-of-the-art management functionality for users to monitor and manage JBOD systems efficiently and flexibly. Users can manage JBOD systems through serial ports and/or Ethernet according to the system configuration on the system. We support varieties of network protocols for network management including Telnet, SSH, Web-GUI, SNMP and SMTP. We also support active system alert function by sending information to the email addresses specified in the system, so the users can be informed of any system changes in a timely manner.

This users' manual is for all series of InWin JBOD systems including RJ-212, RJ-224, RJ-316, RJ-424, RJ-448, RJ-460 and RJ-472. It provides the information and instructions of frequent user functions. Please refer to the table of contents to find the topics you are interested in.

InWin High Density 4U JBOD system shares the same expander user interface. Please use the following image of RJ-472-05 as an example. The actual product's model will appear when the program is executed.

### 5.2 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.

- **Dual Expanders Support**

System can accommodate dual expanders to support data redundancy capability.

- **Power Redundancy**

System can accommodate 2 sets of power modules as redundancy. Either power module could work independently while the peer is out of order or not installed.

- **Hot-Swappable Power Module**

The PSUs are hot-swappable. No need to shut down the system for PSU replacement when necessary.

- **Hot-Swappable Fan Modules**

The fan modules are hot-swappable. No need to shut down the system for fan module replacement when necessary.

- **Faulty System Alarm**

The Faulty System red LED indicator on the front panel illuminates along with a beeping sound when there is a faulty part(s) in the system.

The beeping sound can be muted by pressing the mute button on the front or rear panel.

- **Hot-Swappable HDDs**

The HDDs are hot-swappable. No need to shut down the system for HDD installation and/or replacement when necessary.

- **Smart Fan Control**

The fan modules possess a smart control feature set by the firmware to provide seven levels of speed RPM according to the detected system temperature.

- **Zoning**

This system support feature divides disk drives into two or more different groups depending on the system preference. Each group can own users-configurable number of HDDs independently. This feature enables single JBOD to serve multiple hosts.

- **Cascading**

There are cascading ports on the Expander for cascading another JBOD system to expand disk space when more space is required.

## 5.3 Software Management

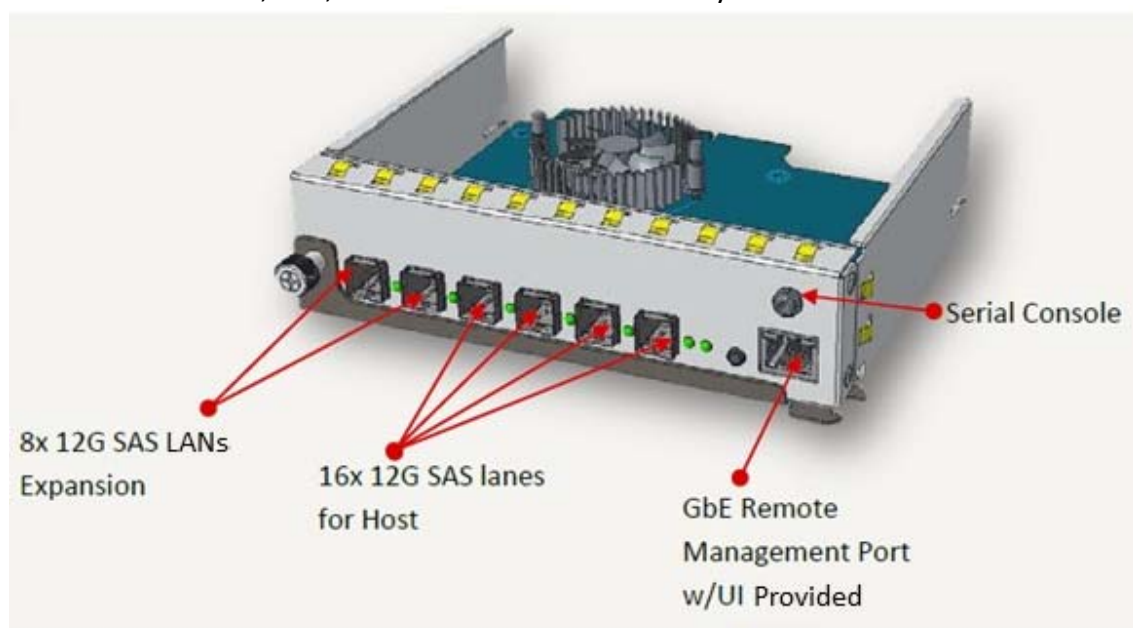
### 5.3.1 System Management Structure

InWin's JBOD Systems supports an out-of-band Network Management feature, which enables a rich set of protocols and a flexible way for SAS Expander management anytime from anywhere.

#### 5.3.1.1 Ethernet Management

The Bridge Expander is equipped with a network management port allowing users to manage JBOD systems from a remote location.

With a proper IP address setting, users can manage the system through Telnet, SSH, Web-GUI and SNMP remotely.



The rich set of network protocols are leveraged for flexible remote management. The supported protocols including Telnet, SSH, Web-GUI, SNMP and SMTP enables various ways to manage the system.

Please be sure the IP address of the system is correctly configured to enable network access. Our system's supports are Static IP address or DHCP dynamic IP address as per users' configuration.

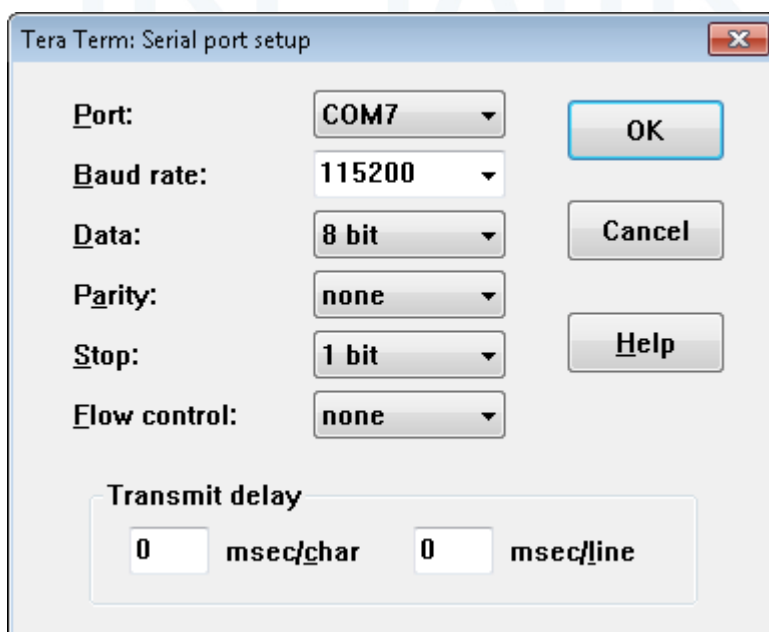
### 5.3.1.2 Serial Port Management

A 3.5mm audio jack serial port (RS-232) on the Expander module enables users to manage the system through terminal console applications such as Tera Term, Putty, etc. Users need to prepare a DB9 RS-232 adapter on host and connect to a serial cable shipped along with the system to gain access to the serial port management. Use CLI commands to manage the system through serial console.

### 5.3.2 Serial Port Management

The RS-232 port on the Expander module provides a serial connection for users to manage the JBOD system with terminal application such as Tera Term, Hyper Term...etc. To manage the JBOD system through the serial port, configure the terminal console as per the settings below to connect it.

Baud Rate : 115200  
Data : 8 bit  
Parity : None  
Stop Bit : 1 bit  
Flow Control : None



### 5.3.2.1 CLI Commands

Some useful CLI commands are listed below

#### ■ Network Management Layer

The “/mgmt.s#” prompts in the Console Terminal, which means the system is now in the network management level. Under this level, users can manage the network setting such as configuring the IP address and enabling/disabling services.

The “list” command displays all the Ethernet layer commands the system supports.

```
/mgmt.s# list
?      dns      expander3  mail      ping      snmp      userdel
console expander0  gateway    netmask   reboot    timezone  userlist
date   expander1  help       ntp       save      upgrade   version
dhcp   expander2  ipaddr     passwd    service   useradd
/mgmt.s#
```

The “help” command lists the description of the commands.

```
/mgmt.s# help
cd          change control path to management board or expander control path
date       display or set current date/time
dhcp       display or set DHCP client
dns        display or set DNS server
gateway    display or set router (example: 192.168.100.254)
ipaddr     display or set Ethernet IP address (example: 192.168.100.100)
list       list path commands or control path
mail       display or set sendmail parameters
netmask    display or set Ethernet IP netmask (default: 255.255.255.0)
passwd     change password
reboot     reboot management board
save       save config to NVRAM
service    display or set service(telnet/SSH/WEB/SNMP)
upgrade    upgrade management board or expander software
useradd    add new user account
userdel    delete a user account
userlist   list user account
version    display management board's information
/mgmt.s#
```

Type command without argument to display the current status.

```
/mgmt.s# service
Telnet Server: 1
WEB Server: 1
SNMP Agent: 1
SSH Server: 1
Send Mail: 0
/mgmt.s#
```

Type command with “?” to display the usage of the command.

```
/mgmt.s# service ?
Usage: service [telnet|web|snmp|ssh|mail] [0|1]
/mgmt.s#
```

Type command with argument to configure the setting of the command.

```
/mgmt.s# service mail 1
/mgmt.s# service
Telnet Server: 1
WEB Server: 1
SNMP Agent: 1
SSH Server: 1
Send Mail: 1
/mgmt.s#
```

**Note:**

Any changes that have been made only available until system reboot. Please be sure to type 'save' command to store the configuration so the changes will be kept for next system boot.

## ■ Expander Management Layer

The `"cd expander0"` changes the directory for bridge expander management. In this layer, users can manage SAS Expander settings `"cd .."` to change the directory back to the upper layer. It's typically used for jumping back to the network management layer from expander management layer.

The `"?"` or `"help"` displays the CLI commands for the SAS Expander.

```
/mgmt.s# cd expander0
/mgmt.s/expander0# ?
?
=====
Function                                Command
=====
Enclosure Info                          encl [Info-Type]
- Info-Type:
  rev      : Show H/W & S/W revision
  sensor   : Show enclosure sensor state
  pd       : Show disk phy state
  pmon     : phy signal monitoring
  (Omit Info-Type to dump all)
  cmfg     : Show MFG embeded in FW

QA Test                                t.qa

Thermal status                          t.thermal

Fan speed reading                        t.fan

Zone Configuartion                      ucfg.zone < [state] | enable | disable >
When enabled:
-- Disks are divided into 2 zones
-- Each BRC exposes disks in one zone
(PPrimary: Zone #1 ; Secondary: Zone #2)

Console Select                           con [ 0 .. 2 | 'n' | 'p' | '?' ]
'n': 'p': switch to next/previous console,
'?' : display current console ID
=====
```

Type `"command"` to display the current status of the command.

```
/mgmt.s/expander0# encl rev
encl rev

Vendor ID      : IN WIN
Product ID     : RJ-472-05pb
Project ID     : 4WL1A
HW version     : A
FW version     : 00.0C.02.EE 00.12.02.238. 10/03/2017 18:02
MFG CFG Version: 00.0C.00.01 10/14/2016 15:55
SAS address    : 5B0BD6D1A304403F
I2C peer error count : 0
```

Type `"? <command>"` to display usage of the command.

```
/mgmt.s/expander0# ? encl
? encl
=====
Function                                Command
=====
Enclosure Info                          encl [Info-Type]
- Info-Type:
  rev      : Show H/W & S/W revision
  sensor   : Show enclosure sensor state
  pd       : Show disk phy state
  pmon     : phy signal monitoring
  (Omit Info-Type to dump all)
  cmfg     : Show MFG embeded in FW
=====
```

As the design, there are three internal expanders inside the chassis expanded from the bridge expander. Users can also get into the internal expander management when required.

Type `"cd expander1"` to manage 1<sup>st</sup> expander.

Type `"cd expander2"` to manage 2<sup>nd</sup> expander.

Type `"cd expander3"` to manage 3<sup>rd</sup> expander.

**Note:**

Please jump back to "mgmt.s" layer by typing `"cd .."` every time before you can jump to another expander management layer.

### 5.3.3 Network Management

The Ethernet port on Expander module is to provide Network Management in various protocols such as Telnet, SSH, Web-GUI and SNMP. It also provides an email notification while an alarm is in effect by properly configuring the SMTP information.

The default settings of the network information are as listed below:

IP Address : 192.168.100.1 (Static IP Address)  
Subnet Mask : 255.255.255.0  
Gateway : 192.168.100.254  
Username : admin  
Password : default

- \* Please be sure the system IP network is reachable by the management host.
- \* Users can make changes of the settings to meet the network environment.
- \* For security reasons, we strongly recommend users to change the password immediately before the system is put online.

**Note:**

The factory default IP address is static address 192.168.100.1. If there is a DHCP server in the IP network, users can simply change the IP address on web GUI or through serial console.

In serial console, type `"dhcp 1"` in "mgmt.s" layer to enable dynamic IP address for the system. Type `"save"` so the setting is kept for the next system boot.

#### 5.3.3.1 Telnet

- The Telnet service is enabled by default. It shares the same level of CLI commands as it is through the serial console terminal.  
Users can disable the Telnet support on web GUI or with CLI commands if there are security concerns.  
In CLI, in "mgmt.s" layer type `"service telnet 0"` to disable telnet service.
- The difference compared with serial console is that Telnet sessions require a Credential (Username and Password) to gain access to it.

Refer to the above session for the default credential information.

- Below is a reference capture of a tenet session.

```

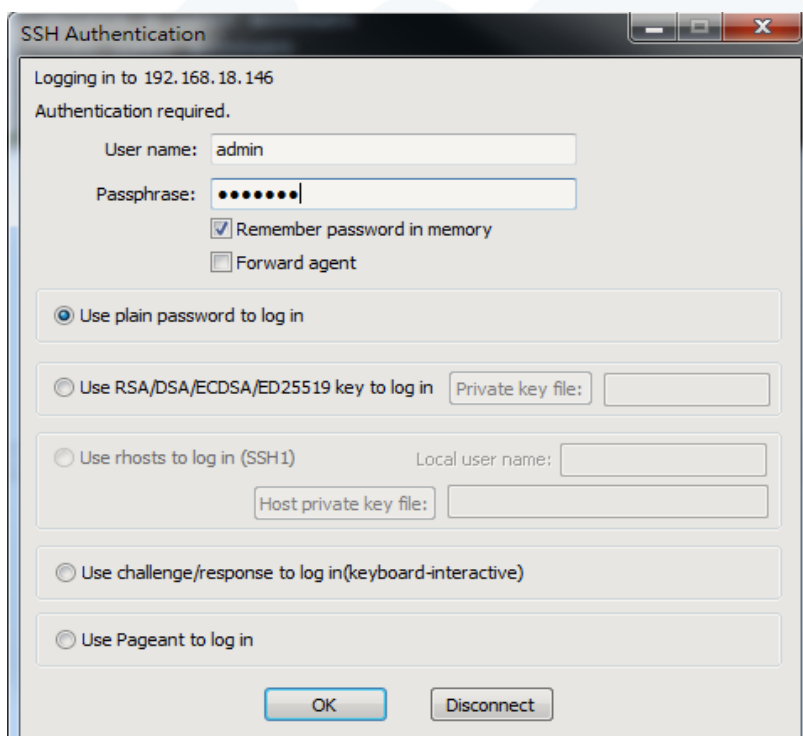
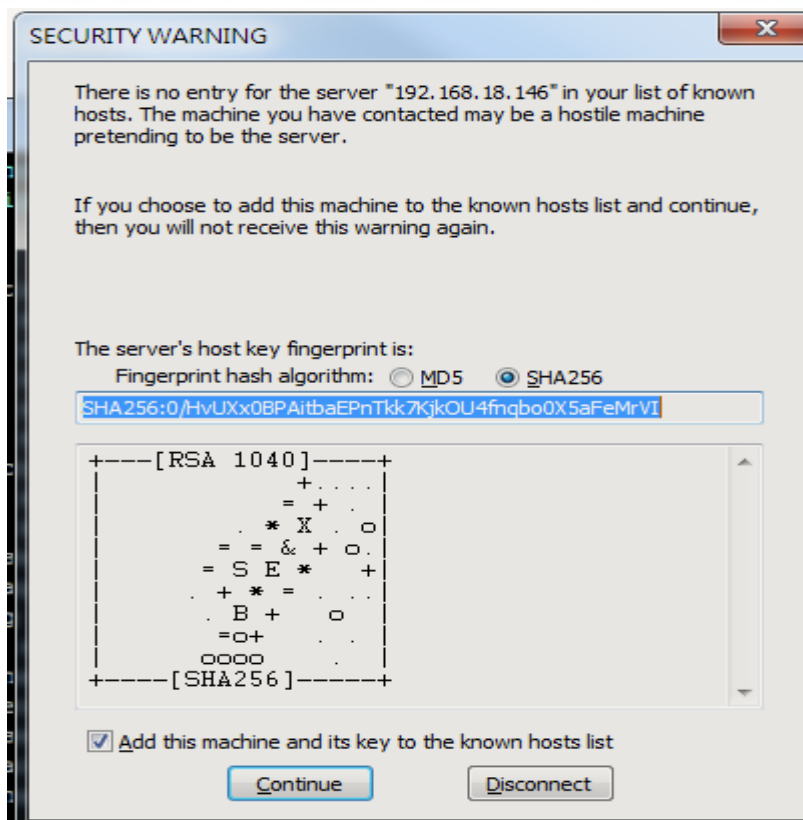
C:\> Telnet 192.168.18.144

RJ-472-05 login: admin
Password:
/mgmt.s# help
cd          change control path to management board or expander control path
date        display or set current date/time
dhcp        display or set DHCP client
dns          display or set DNS server
gateway     display or set router (example: 192.168.100.254)
ipaddr      display or set Ethernet IP address (example: 192.168.100.100)
list        list path commands or control path
mail        display or set sendmail parameters
netmask     display or set Ethernet IP netmask (default: 255.255.255.0)
passwd      change password
reboot      reboot management board
save        save config to NVRAM
service     display or set service(telnet/SSH/WEB/SNMP)
upgrade     upgrade management board or expander software
useradd     add new user account
userdel     delete a user account
userlist    list user account
version     display management board's information
/mgmt.s#
  
```

### 5.3.3.2 SSH

- The SSH service is enabled by default. It provides the same level of CLI commands as it is through serial console or Telnet session.
- SSH provides a secure connection between host and the JBOD system. It is enabled by default on most Linux OSes. There are some freeware SSH tools for Windows such as Putty, Tera Term, ...etc.
- Below is the Tera Term example to establish the SSH session.





```

192.168.18.146 - Tera Term VT
File Edit Setup Control Window Help
/mgmt.s# list
?      dns      expander3  mail      ping      snmp      userdel
console expander0  gateway    netmask   reboot    timezone  userlist
date   expander1  help       ntp       save      upgrade   version
dhcp   expander2  ipaddr     passwd    service   useradd

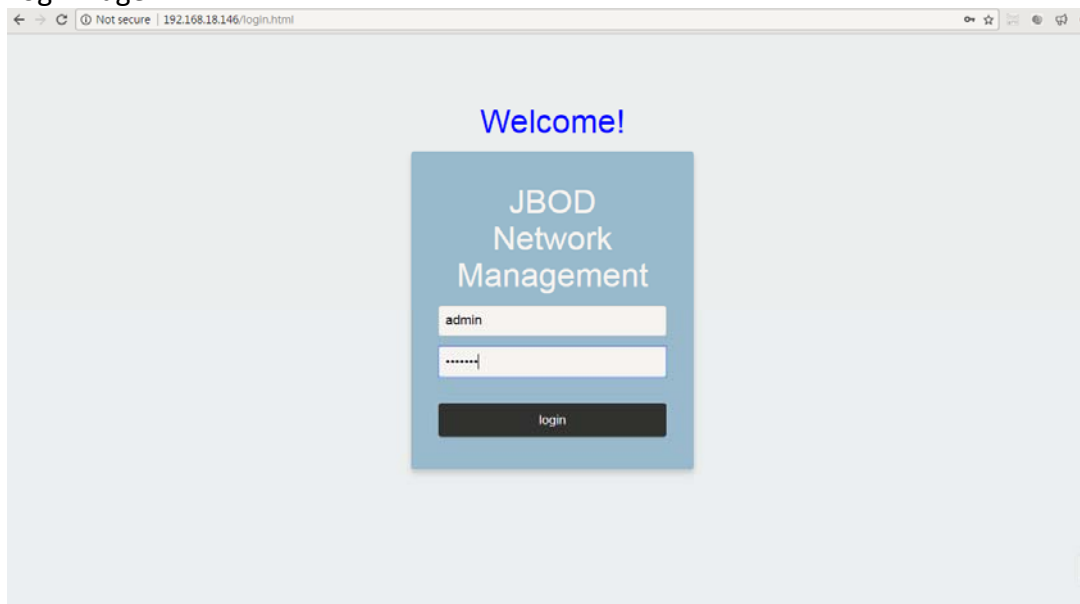
/mgmt.s# help
cd      change control path to management board or expander control path
date   display or set current date/time
dhcp   display or set DHCP client
dns     display or set DNS server
gateway display or set router (example: 192.168.100.254)
ipaddr display or set Ethernet IP address (example: 192.168.100.100)
list    list path commands or control path
mail    display or set sendmail parameters
netmask display or set Ethernet IP netmask (default: 255.255.255.0)
passwd  change password
reboot  reboot management board
save    save config to NVRAM
service display or set service(telnet/SSH/WEB/SNMP)
upgrade upgrade management board or expander software
useradd add new user account
userdel delete a user account
userlist list user account
version display management board's information
/mgmt.s#

```

### 5.3.3.3 Web-GUI

- The Web-GUI is the easiest way to manage the JBOD system. It is enabled by default on this system.
- Users can simply open the web browser and give the JBOD management IP address in the URL address field to start managing.

#### Login Page



#### Version Page

192.168.18.146/default.asp

RJ-472-05 admin

IN WIN

Version System Network Disk Zone Tool Console

**Management Board**

|               |                     |
|---------------|---------------------|
| Model         | RJ-472-05           |
| Serial Number | 1709E50143          |
| MAC Address   | AC40EA0135C7        |
| Version       | 2.0.8               |
| Build Date    | 2017-08-25 10:53:35 |

**Enclosure**

|                  |      |
|------------------|------|
| Enclosure Height | 4U   |
| Bay Number       | 72   |
| HDD Type         | 3.5" |

**Expander 0**

|           |        |
|-----------|--------|
| Vendor ID | IN WIN |
|-----------|--------|

### System Page.

192.168.18.146/system.asp

RJ-472-05 admin

IN WIN

Version System Network Disk Zone Tool Console

**Temperature Status (C)**

|              |    |
|--------------|----|
| Exp BRP Die  | 71 |
| Exp BPP1 Die | 60 |
| Exp BPP2 Die | 69 |
| Exp BPP3 Die | 65 |
| Exp BRS Die  | 69 |
| Exp BPS1 Die | 63 |
| Exp BPS2 Die | 68 |
| Exp BPS3 Die | 69 |
| BP1-Sensor1  | 22 |
| BP1-Sensor2  | 22 |
| BP2-Sensor1  | 22 |
| BP2-Sensor2  | 22 |
| BP3-Sensor1  | 23 |

#### 5.3.3.4 SNMP

- The SNMP is a popular network device management protocol that is widely used by IT people to manage mass amounts of systems, devices and equipment which are embedded with a SNMP agent.
- The InWin JBOD system's management module is implemented by a SNMP agent with v1 and v2c support.
- Users need to configure the same read and write community string in the JBOD system as the SNMP manager so the system can be managed by the SNMP Manager.
- An InWin proprietary MIB, which defines system information, is required for the SNMP Manager so the OID is accessible.

Below is the proprietary MIB file:



inwin-jnm.mib

## ■ SNMP Settings on the System

Users can change the SNMP settings through CLI and Web-GUI.

- Check and configure via CLI

```
/mgmt.s# snmp
community read: public
community write: private
sysName: RJ-472-05
sysContact: Company
sysLocation: Room 1-1
/mgmt.s#
/mgmt.s# snmp ?
Usage: snmp <read|write|sysName|sysDescr|sysContact|sysLocation> 'parameter'
```

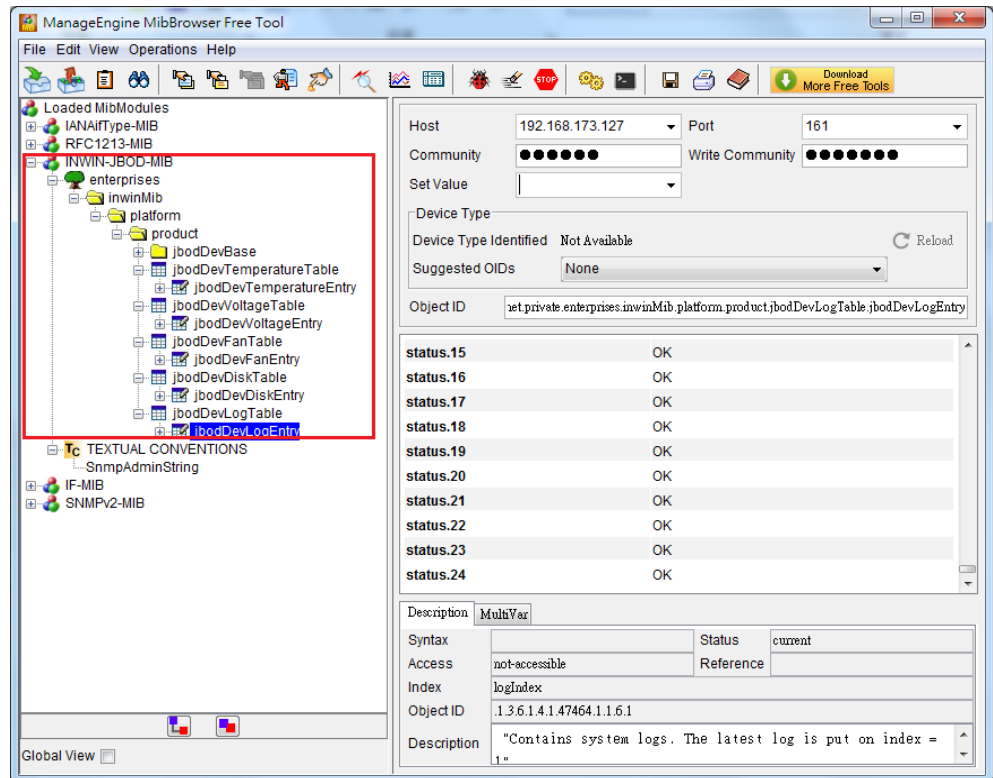
- Check and configure via Web

### SNMP Setting

|                                      |                                                     |
|--------------------------------------|-----------------------------------------------------|
| Read Community                       | <input type="text" value="public"/>                 |
| Write Community                      | <input type="text" value="private"/>                |
| sysName                              | <input type="text" value="JBOD"/>                   |
| sysContact                           | <input type="text" value="IN-WIN Development Inc"/> |
| sysLocation                          | <input type="text" value="Room 1-1"/>               |
| <input type="button" value="Apply"/> |                                                     |

## ■ SNMP Manager

Any SNMP Managers can be used to manage the system by properly configuring the system settings including IP address, read community string and write community string to match the settings in the system. Compiling the InWin JBOD MIB file to the SNMP manager is necessary. Below is an example to browse the system MIB with a free SNMP Manager tool.



### 5.3.4 Version Information

Users can check the system hardware and firmware version through various ways with CLI commands, Web GUI and SNMP.

#### 5.3.4.1 CLI (UART, Telnet and SSH)

- Type the “**version**” command on “mgmt.s” Layer to display all the version information including Ethernet firmware version, Expander HW version, Expander firmware version and MFG CFG file version.

```

Telnet 192.168.18.144
/ mgmt.s# version
Management Board
-----
Model       : RJ-472-05
Serial Number : 1709E50141
MAC Address  : AC40EA0135C5
Version      : 2.0.8
Build Date   : 2017-08-25 10:53:35

Expander 0
-----
Vendor      : IN WIN
Product     : RJ-472-05pb
Firmware Version: 00.0C.02.EE
MFG CFG Version : 00.01.3A.A1
SAS Address  : 5B0BD6D1A304403F

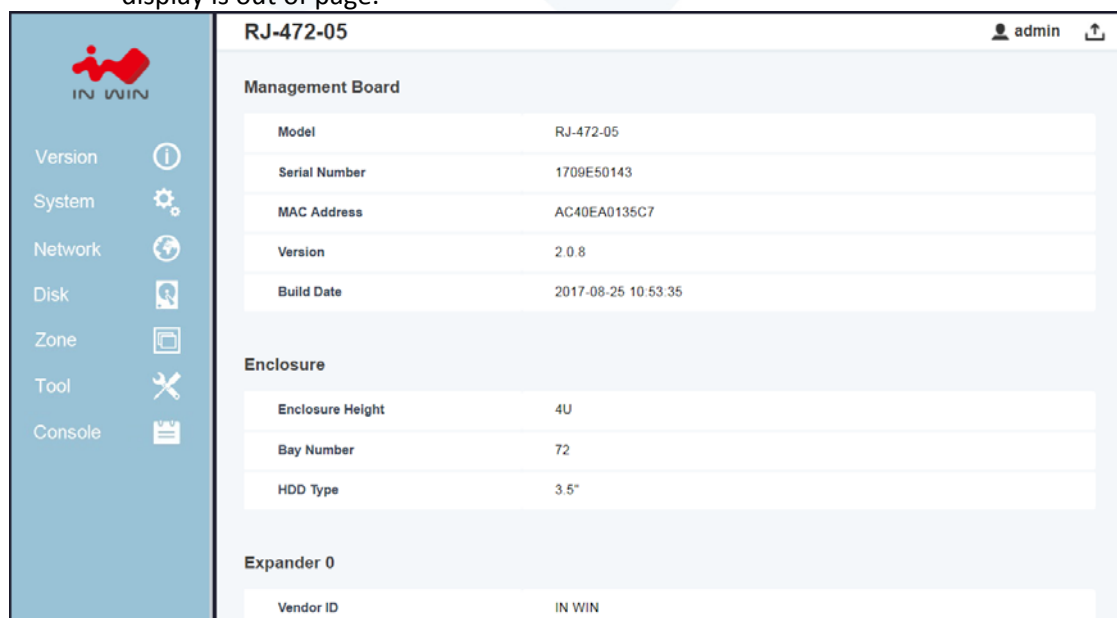
Expander 1
-----
Vendor      : IN WIN
Product     : RJ-472-05p1
Firmware Version: 00.0C.02.EE
MFG CFG Version : 00.01.3B.F1
SAS Address  : 5B0BD6D1A304407F

Expander 2
-----
Vendor      : IN WIN
Product     : RJ-472-05p2
Firmware Version: 00.0C.02.EE
MFG CFG Version : 00.01.3B.F1
SAS Address  : 5B0BD6D1A30440BF

Expander 3
-----
Vendor      : IN WIN
Product     : RJ-472-05p3
Firmware Version: 00.0C.02.EE
MFG CFG Version : 00.01.3B.F1
SAS Address  : 5B0BD6D1A30440FF
/ mgmt.s#
  
```

### 5.3.4.2 Web-GUI

- Type system IP address on Web Browser URL address field to gain access to the system. After logging in, click “Version” on the left pane to view the system version information on the right pane. Scroll down to view all information if the display is out of page.



The screenshot shows the Web-GUI interface for the IN WIN storage server. The left sidebar contains navigation options: Version, System, Network, Disk, Zone, Tool, and Console. The main content area displays the system version information for the RJ-472-05 model. The top right shows the user is logged in as 'admin'.

| Management Board |                     |
|------------------|---------------------|
| Model            | RJ-472-05           |
| Serial Number    | 1709E50143          |
| MAC Address      | AC40EA0135C7        |
| Version          | 2.0.8               |
| Build Date       | 2017-08-25 10:53:35 |

| Enclosure        |      |
|------------------|------|
| Enclosure Height | 4U   |
| Bay Number       | 72   |
| HDD Type         | 3.5" |

| Expander 0 |        |
|------------|--------|
| Vendor ID  | IN WIN |

### 5.3.5 System Status

The System Status is to display the status of the system sensors including temperature, voltage, fan speed and power supply. All the SAS Expander modules are equipped with sensors to monitor system health and control environmental cooling systems accordingly.

#### 5.3.5.1 CLI (UART, Telnet and SSH)

- Type “`encl sensor`” command in “`mgmt.s/expander0`” layer to display the System sensors’ readings and their status.
- Please note that the Expander temperature sensors “Exp Die” is the silicon core temperature and the temperature sensors “BPx-Sensor x” are on the backplanes.
- There are mechanisms communicating between primary and secondary domain expander modules so the peer side module sensors information can be exposed at the same screen.

```

Telnet 192.168.18.144
/mgmt.s/expander0# encl sensor
encl sensor

<< Enclosure Sensor State >>

Temperature      14 0x0
( 1) Exp BRP Die :    71 dC  status : OK
( 2) Exp BPP1 Die :    60 dC  status : OK
( 3) Exp BPP2 Die :    69 dC  status : OK
( 4) Exp BPP3 Die :    65 dC  status : OK
( 5) Exp BRS Die  :    69 dC  status : OK
( 6) Exp BPS1 Die :    63 dC  status : OK
( 7) Exp BPS2 Die :    68 dC  status : OK
( 8) Exp BPS3 Die :    69 dC  status : OK
( 9) BP1-Sensor1  :    22 dC  status : OK
(10) BP1-Sensor2  :    22 dC  status : OK
(11) BP2-Sensor1  :    22 dC  status : OK
(12) BP2-Sensor2  :    22 dC  status : OK
(13) BP3-Sensor1  :    23 dC  status : OK
(14) BP3-Sensor2  :    22 dC  status : OK

Voltage          6 0x0
( 1) BP1-5V Senso :    4.99 V  status : OK
( 2) BP1-12V Sens :   12.07 V  status : OK
( 3) BP2-5V Senso :    4.99 V  status : OK
( 4) BP2-12V Sens :   12.17 V  status : OK
( 5) BP3-5V Senso :    4.97 V  status : OK
( 6) BP3-12V Sens :   12.05 V  status : OK

Fan              14 0x0
( 1) EnclFan1     :   5970 RPM status : OK
( 2) EnclFan2     :   6240 RPM status : OK
( 3) EnclFan3     :   6120 RPM status : OK
( 4) EnclFan4     :   6240 RPM status : OK
( 5) EnclFan5     :   6000 RPM status : OK
( 6) EnclFan6     :   5910 RPM status : OK
( 7) BrcFan       :   4920 RPM status : OK
( 8) Bpc1Fan      :   4860 RPM status : OK
( 9) Bpc2Fan      :   4860 RPM status : OK
(10) Bpc3Fan      :   4770 RPM status : OK
(11) PeerBrcFan   :   5220 RPM status : OK
(12) PeerBpc1Fan  :   4800 RPM status : OK
(13) PeerBpc2Fan  :   4800 RPM status : OK
(14) PeerBpc3Fan  :   4860 RPM status : OK

Power Supply     2 0x0
( 1) AC Module 1  :          status : OK
( 2) AC Module 2  :          status : OK

```

#### 5.3.5.2 Web-GUI

- Type the system IP address on the web browser URL filed to gain access to the system. After logging in, click “System” on the left panel to view the system status information on the right panel. Scroll down to view all information if the display is out of page.



- Version 
- System 
- Network 
- Disk 
- Zone 
- Tool 
- Console 

RJ-472-05
admin 

Temperature Status (°C)

|              |    |
|--------------|----|
| Exp BRP Die  | 71 |
| Exp BPP1 Die | 60 |
| Exp BPP2 Die | 69 |
| Exp BPP3 Die | 65 |
| Exp BRS Die  | 69 |
| Exp BPS1 Die | 63 |
| Exp BPS2 Die | 68 |
| Exp BPS3 Die | 69 |
| BP1-Sensor1  | 22 |
| BP1-Sensor2  | 22 |
| BP2-Sensor1  | 22 |
| BP2-Sensor2  | 22 |
| BP3-Sensor1  | 23 |

### 5.3.6 Network Settings

The Network settings is for configuring system network information such as DHCP/Static IP Address selection, Network Services, Mail configuration and SNMP configuration.

#### 5.3.6.1 CLI (UART, Telnet and SSH with Ethernet Board)

- There are a couple network setting commands on "mgmt.s" layer such as "ipaddr", "gateway", "netmask", ...etc. to view and configure the settings respectively.
- Please be sure to apply the "save" command so the settings are saved for the next system reboot.

```

/mgmt.s# list
?      dns      expander3  mail      ping      snmp      userdel
console expander0  gateway    netmask   reboot    timezone  userlist
date   expander1  help       ntp       save      upgrade   version
dhcp   expander2  ipaddr     passwd    service   useradd

/mgmt.s#
/mgmt.s# ipaddr
Current IP Address: 192.168.18.144
Configure Static IP Address: 192.168.100.1
/mgmt.s#
/mgmt.s# gateway
Current Gateway: 192.168.18.254
Config Gateway: 192.168.100.254
/mgmt.s#
/mgmt.s# ntp
NTP server: time.stdtime.gov.tw
/mgmt.s#

```

#### 5.3.6.2 Web-GUI

- Type the system IP address on the web browser URL field to gain access to the system. After logging in, click the "Network" button on the left panel to view the network information on the right panel. Scroll down to view all information if the display is out of page.



- Version 
- System 
- Network 
- Disk 
- Zone 
- Tool 
- Console 

RJ-472-05 admin

Current Network Status: DHCP

| Management IP  | Netmask       | Gateway        | DNS         |
|----------------|---------------|----------------|-------------|
| 192.168.18.144 | 255.255.255.0 | 192.168.18.254 | 192.168.5.1 |

IP Address Automation

☐ Static IP
 ☒ DHCP
 Apply

Network Service Setting

☒ Telnet
 ☒ WEB
 ☒ SSH
 ☒ SNMP
 ☐ Sendmail
 Apply

Static IP Setting

LAN IP

Netmask

### 5.3.7 Disk Information

The disk information is to show the disk drives' status on the system, including Bay id, Phy id, SAS Address, Link speed and current status.

#### 5.3.7.1 CLI (UART, Telnet and SSH)

- Type the “**phyinfox -s**” command on “mgmt.s/expander0” layer to display the system hard disk drives' status on the system.

```

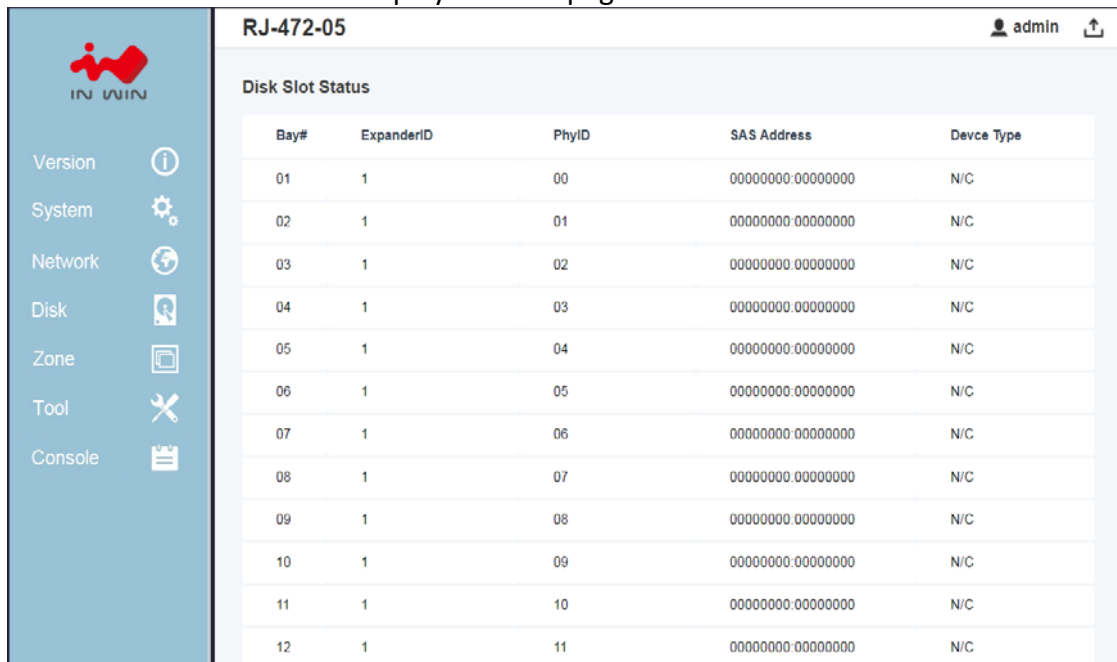
/mgmt.s/expander0# phyinfox -s
phyinfox -s

=== Phy status in Consolidated SES ArrayDevice Directory ===

Bay  BPC  PhyID      SAS_Addr      Attached
ID                                     PhyID      SAS_Addr      Device
01  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
02  1    01    5B0BD6D1:A304407F  0  00000000:00000000  N/C
03  1    02    5B0BD6D1:A304407F  0  00000000:00000000  N/C
04  1    03    5B0BD6D1:A304407F  0  00000000:00000000  N/C
05  1    04    5B0BD6D1:A304407F  0  00000000:00000000  N/C
06  1    05    5B0BD6D1:A304407F  0  00000000:00000000  N/C
07  1    06    5B0BD6D1:A304407F  0  00000000:00000000  N/C
08  1    07    5B0BD6D1:A304407F  0  00000000:00000000  N/C
09  1    08    5B0BD6D1:A304407F  0  00000000:00000000  N/C
10  1    09    5B0BD6D1:A304407F  0  00000000:00000000  N/C
11  1    10    5B0BD6D1:A304407F  0  00000000:00000000  N/C
12  1    11    5B0BD6D1:A304407F  0  00000000:00000000  N/C
13  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
14  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
15  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
16  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
17  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
18  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
19  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
20  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
21  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
22  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
23  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
24  1    00    5B0BD6D1:A304407F  0  00000000:00000000  N/C
25  2    00    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
26  2    01    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
27  2    02    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
28  2    03    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
29  2    04    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
30  2    05    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
31  2    06    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
32  2    07    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
33  2    08    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
34  2    09    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
35  2    10    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
36  2    11    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
37  2    00    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
38  2    00    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
39  2    00    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
40  2    00    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
41  2    00    5B0BD6D1:A30440BF  0  00000000:00000000  N/C
  
```

### 5.3.7.2 Web-GUI

- Type the system IP address on the web browser URL field to gain access to the system. After logging in, click the “Disk” button on the left panel to view the disk drives information on the right panel. Scroll down to view all information if the display is out of page.



The screenshot shows the InWin Web-GUI interface. On the left is a navigation menu with options: Version, System, Network, Disk (selected), Zone, Tool, and Console. The main area displays the 'Disk Slot Status' for system 'RJ-472-05' under the 'admin' user. It contains a table with 5 columns: Bay#, ExpanderID, PhyID, SAS Address, and Device Type. The table lists 12 bays, all with ExpanderID 1 and Device Type N/C.

| Bay# | ExpanderID | PhyID | SAS Address       | Device Type |
|------|------------|-------|-------------------|-------------|
| 01   | 1          | 00    | 00000000:00000000 | N/C         |
| 02   | 1          | 01    | 00000000:00000000 | N/C         |
| 03   | 1          | 02    | 00000000:00000000 | N/C         |
| 04   | 1          | 03    | 00000000:00000000 | N/C         |
| 05   | 1          | 04    | 00000000:00000000 | N/C         |
| 06   | 1          | 05    | 00000000:00000000 | N/C         |
| 07   | 1          | 06    | 00000000:00000000 | N/C         |
| 08   | 1          | 07    | 00000000:00000000 | N/C         |
| 09   | 1          | 08    | 00000000:00000000 | N/C         |
| 10   | 1          | 09    | 00000000:00000000 | N/C         |
| 11   | 1          | 10    | 00000000:00000000 | N/C         |
| 12   | 1          | 11    | 00000000:00000000 | N/C         |

### 5.3.8 Firmware Upgrade

The firmware upgrade function provides a way to update system firmware when necessary.

There are 3 firmware for the InWin JBOD system:

1. Network Management Firmware
2. SAS Expander Firmware
3. SAS Expander MFG CFG file

There are a couple of ways to upgrade the system firmware according to the HW configurations. Please note that the upgraded firmware won't take effect until a system reboot

#### Note:

Be careful NOT to power off the system when conducting system firmware upgrade. Power loss during firmware upgrade would somehow crash system firmware.

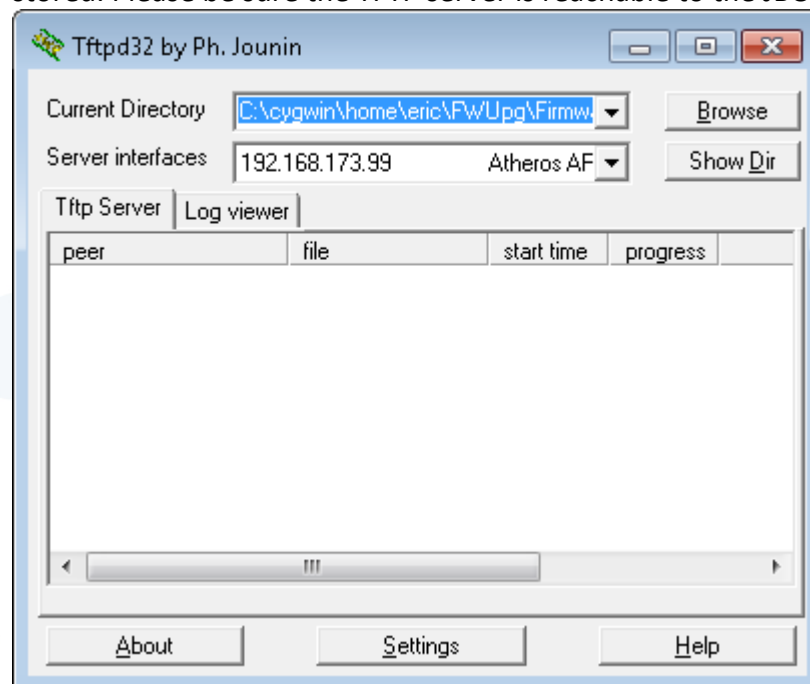
In case firmware crash occurs, call help from technical support.

### 5.3.8.1 CLI (Telnet or SSH)

Users are able to upgrade management firmware, SAS Expander firmware and MFG CFG file through TFTP instead of Xmodem when using CLI commands.

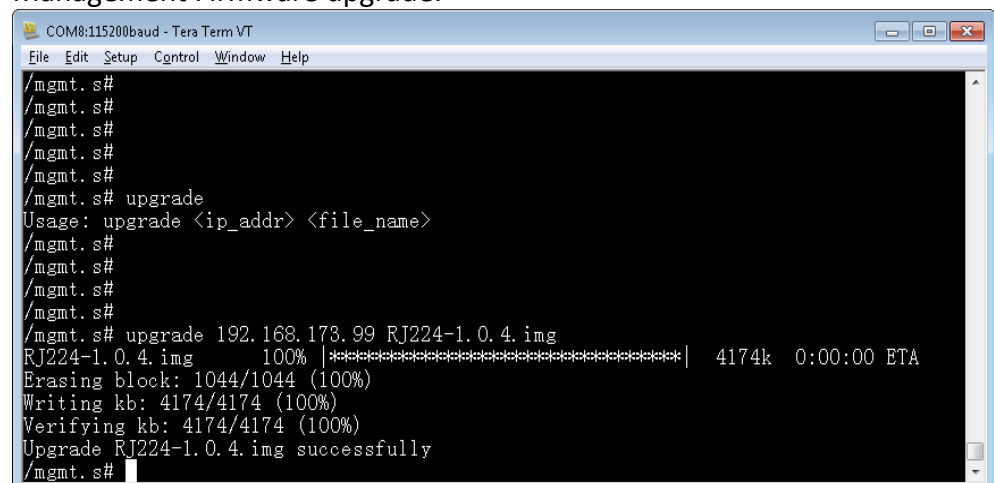
All sorts of firmware upgrades going through TFTP would be intelligently upgraded to the right hardware. More conveniently, all Expanders (including Bridge Expander and internal expanders, they are sharing the same firmware and MFG file) can be upgraded at the same time when upgrade command is applied and committed.

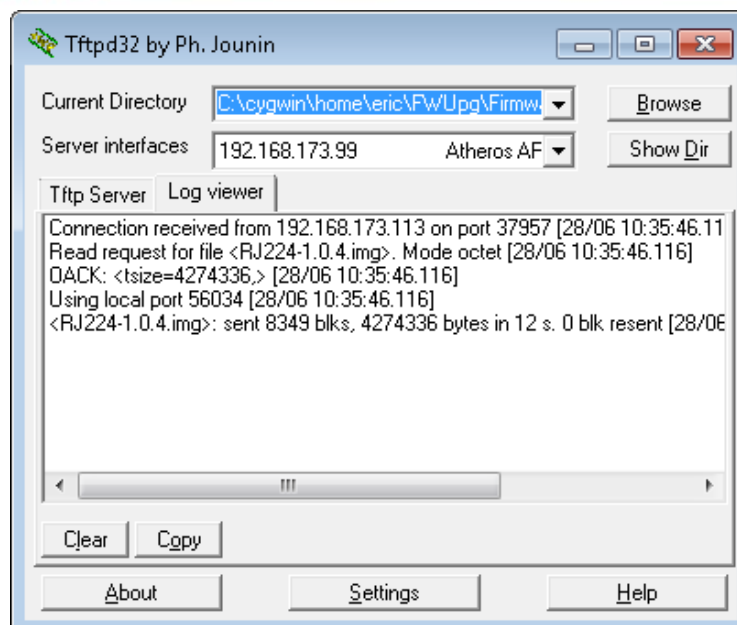
To upgrade through TFTP, open a TFTP server on your console host and specify the path in TFTP server to the directory where the firmware is stored. Please be sure the TFTP server is reachable to the JBOD system.



#### ■ Management Firmware upgrade

Type “`upgrade <tftp_server_ip> <filename>`” command to start Management Firmware upgrade.

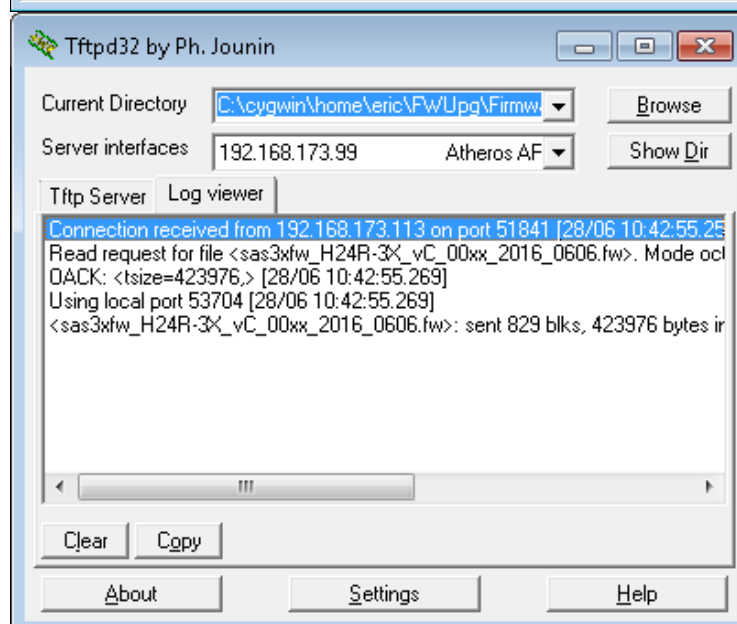
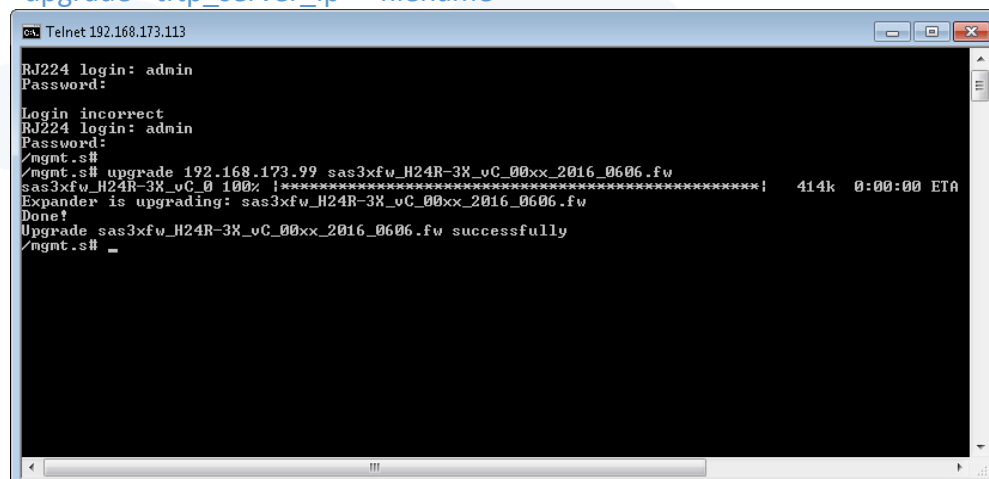




## ■ SAS Expander Firmware

It's the same as for Management firmware by using the Expander Firmware filename instead in command.

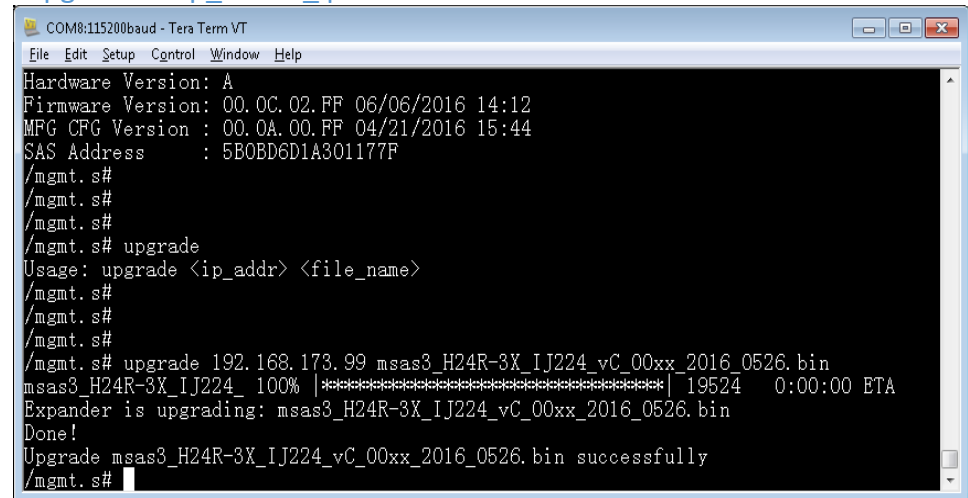
**“upgrade <tftp\_server\_ip> <filename>”**



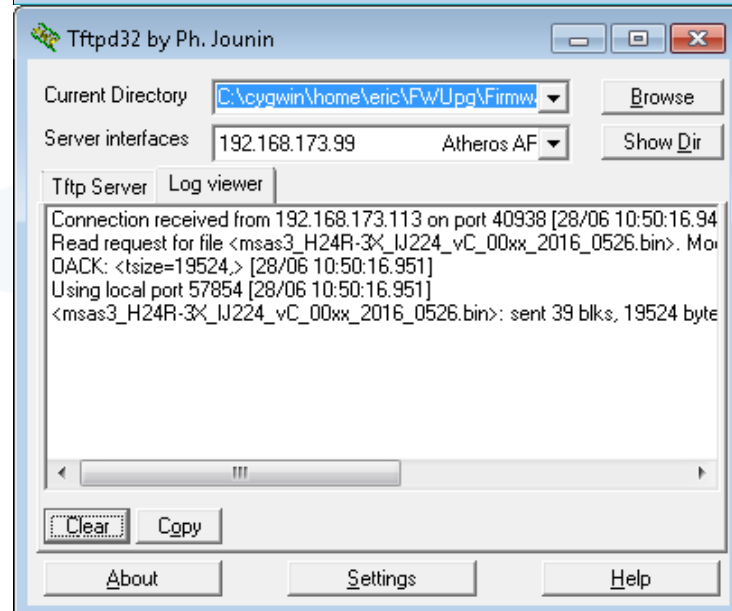
### ■ SAS Expander MFG CFG file

Same as Management firmware by using the Expander MFG CFG file filename in command.

“upgrade <tftp\_server\_ip> <filename>”



```
COM8:115200baud - Tera Term VT
File Edit Setup Control Window Help
Hardware Version: A
Firmware Version: 00.0C.02.FF 06/06/2016 14:12
MFG CFG Version : 00.0A.00.FF 04/21/2016 15:44
SAS Address : 5B0BD6D1A301177F
/mgmt.s#
/mgmt.s#
/mgmt.s#
/mgmt.s# upgrade
Usage: upgrade <ip_addr> <file_name>
/mgmt.s#
/mgmt.s#
/mgmt.s#
/mgmt.s# upgrade 192.168.173.99 msas3_H24R-3X_IJ224_vC_00xx_2016_0526.bin
msas3_H24R-3X_IJ224_100% |*****| 19524 0:00:00 ETA
Expander is upgrading: msas3_H24R-3X_IJ224_vC_00xx_2016_0526.bin
Done!
Upgrade msas3_H24R-3X_IJ224_vC_00xx_2016_0526.bin successfully
/mgmt.s#
```



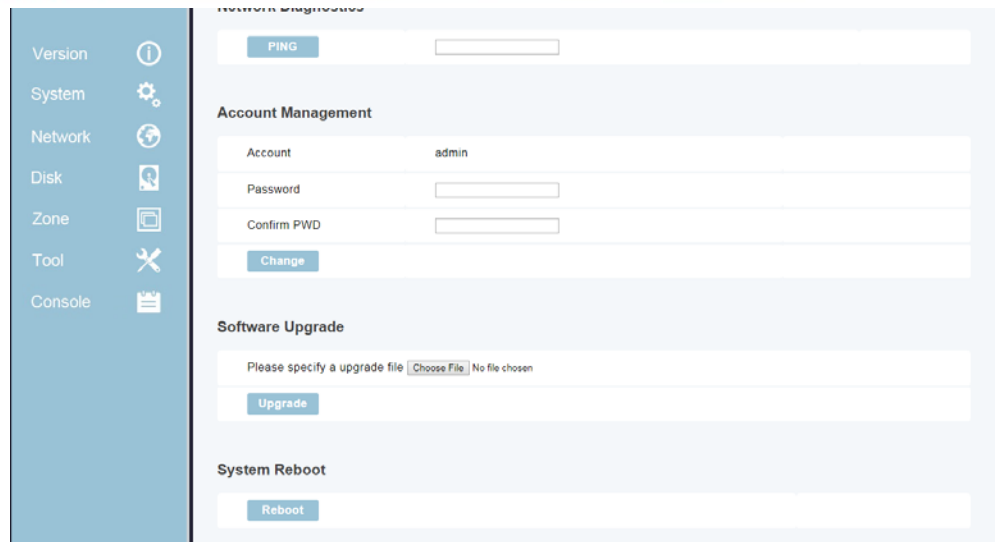
### 5.3.8.2 Web-GUI

- Upgrade system firmware through Web-GUI is much easier than other ways. Just simply select the firmware by file browser and click 'Apply' to start.

All the firmware including Network Management firmware, SAS Expander firmware and MFG CFG file apply the same way to upgrade.

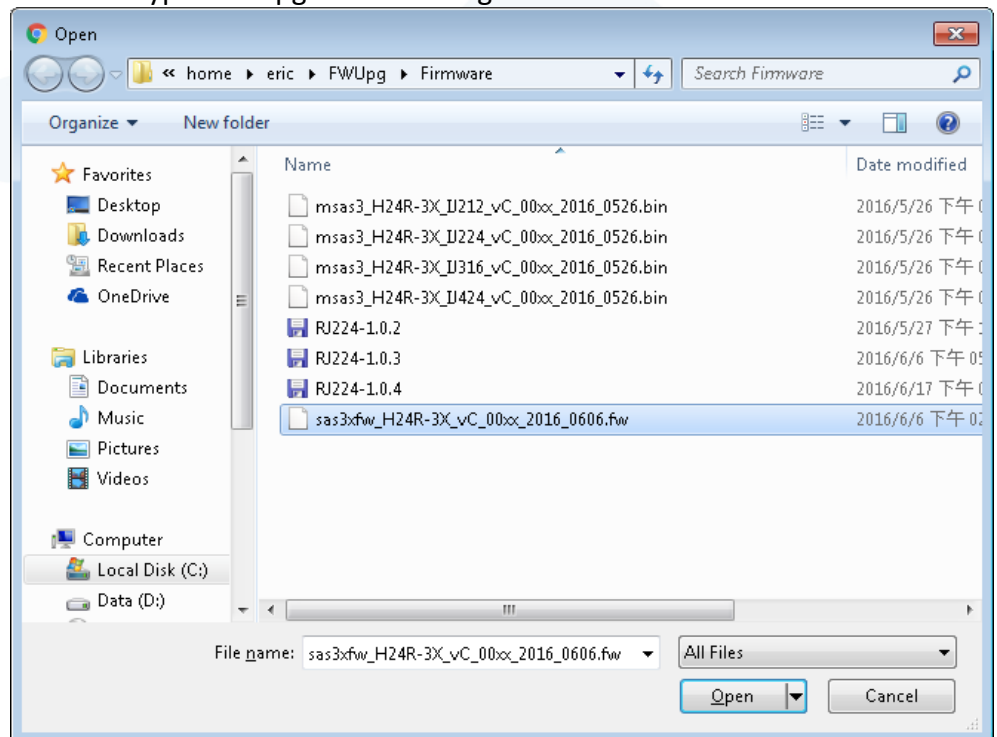
After system upgrade, be sure to reboot system to take effect the new firmware which has been upgraded to the hardware.

- Click the “Tool” button on the left panel and scroll down to “Software Upgrade,” the session is on the right panel.

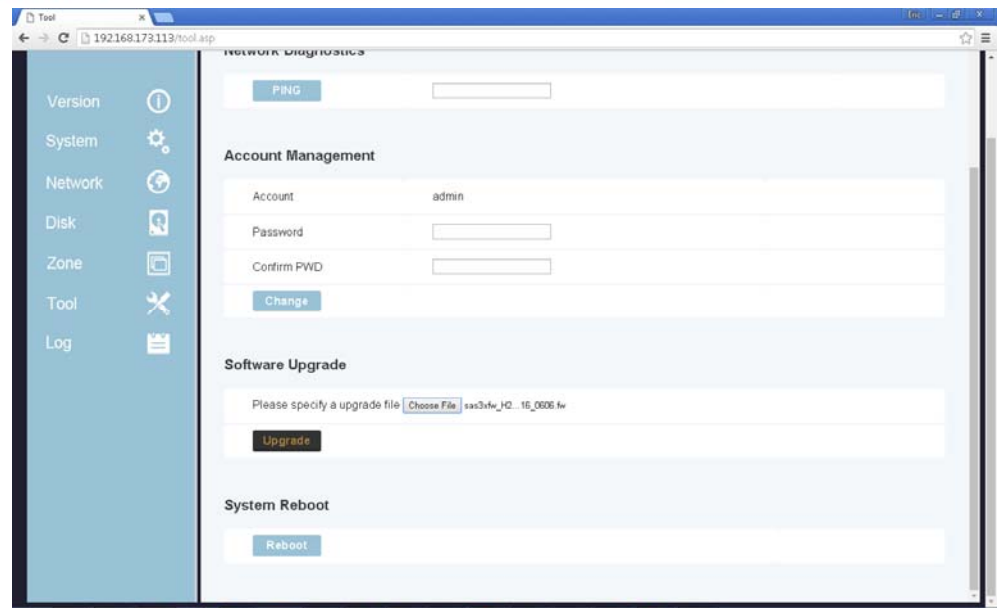


Click the “Choose File” button to select the firmware being upgraded from file browser and click “Open” to commit.

The firmware can be management firmware, SAS Expander firmware or SAS Expander MFG CFG file. The system would intelligently detect the firmware type and upgrade to the right hardware.



Click the “Upgrade” button to start the firmware upgrade.



Web would direct to a page telling the firmware is upgrading.  
After upgrade is done, Web will direct to the Login page.



A system reboot is require to take effect.

### 5.3.9 Web Console

Web console provides an easy way for users to apply CLI commands to a specific SAS Expander without needing a console terminal.

#### 5.3.9.1 Utilize Web Console

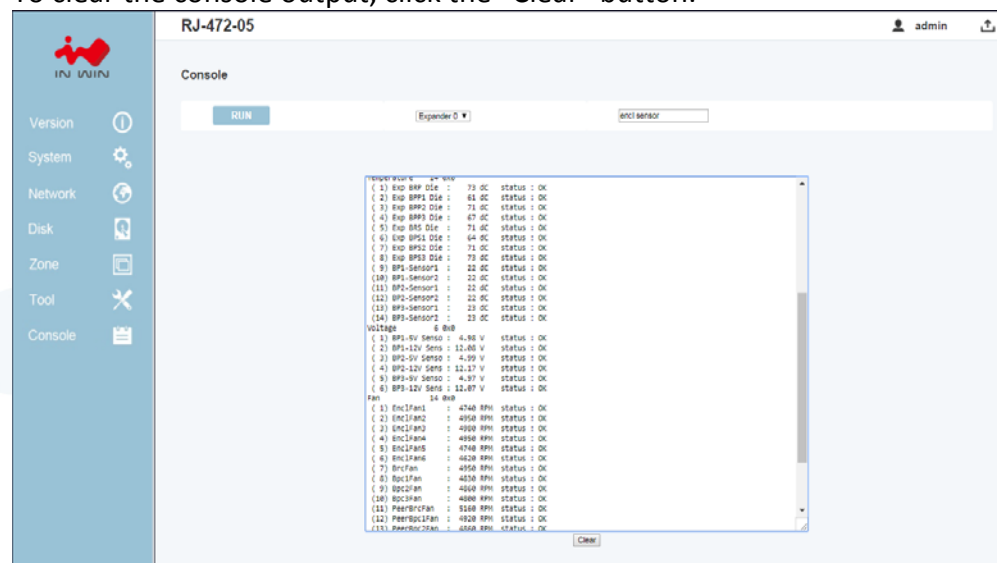
- Login into Web-GUI then click “Console” on the left panel.

Then, on the right panel, select the SAS expander that you would like to apply the command to and fill the command to the rightest square.

Click “RUN” to apply commit the command to expander.

The output of the command would appear on the lower square.

To clear the console output, click the “Clear” button.



## 5.4 Appendix A

### Management Firmware CLI Commands

| Function | Command                                                           |
|----------|-------------------------------------------------------------------|
| cd       | changes control path to management board or expander control path |
| date     | display or set current date/time                                  |
| dhcp     | display or set DHCP client                                        |
| dns      | display or set DNS server                                         |
| gateway  | display or set router (example: 192.168.100.254)                  |
| ipaddr   | display or set Ethernet IP address (example: 192.168.100.100)     |
| list     | list path commands or control path                                |
| mail     | display or set send mail parameters                               |
| netmask  | display or set Ethernet IP netmask (default: 255.255.255.0)       |
| passwd   | change password                                                   |
| reboot   | reboot management board                                           |
| save     | save configuration to NVRAM                                       |
| service  | display or set service (Telnet/SSH/WEB/SNMP)                      |
| upgrade  | upgrade management board or expander software                     |
| useradd  | add new user account                                              |
| userdel  | delete a user account                                             |
| userlist | list user account                                                 |
| version  | display management board's information                            |

## 5.5 Appendix B

### SAS Expander Firmware Useful CLI Commands

| Function           | Command                                                                                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enclosure Info     | encl [Info-Type]                                                                                                                                                                                                    |
|                    | - Info-Type:<br>rev : Show H/W & S/W revision<br>sensor : Show enclosure sensor state<br>pd : Show disk phy state<br>pmon : phy signal monitoring<br>(Omit Info-Type to dump all)<br>cmfg : Show MFG embedded in FW |
| Zone Configuration | ucfg.zone < [state]   enable   disable ><br>When enabled:<br>-- Disks are divided into 2 zones<br>-- Each BRC exposes disks in one zone                                                                             |

| Function                  | Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | (Primary: Zone #1 ; Secondary: Zone #2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Console Select            | con [ 0 .. 2   'n'   'p'   '?' ]<br>'n', 'p': switch to next/previous console,<br>'?' : display current console ID<br>(Omit parameter to select 1st console)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Show/Set the current      | date [ set <newdate(*)>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Date and Time             | send [<SasAddrHi(H)> <SasAddrLow(H)>]  <br>recv [<SasAddrHi(H)> <SasAddrLow(H)>] ]<br>- no arguments, output local expander date/time and uptime<br>- 'set <newdate(*)>' Set local expander date/time using format for <newdate> of YYYYMMDDHHMMSS<br>- 'send [sas_addr]' If sas_addr set then set the remote expander's clock using the local expander's current clock value. If sas_addr not specified then set clock for all expanders in the domain.<br>- 'recv [sas_addr]' If sas_addr set then fetch the remote expander's current clock and output the result. If sas_addr not specified then get and output the current clock for all expanders in the domain. |
| Reset the Expander        | reset [watchdog]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Display phy info.         | phyinfox [ -i [(1 .. NumBpc) ] ]   -s<br>-i : show phy info of BPC expander<br>-s : show SES Array Device info of CSE BRC<br>(bridge console only)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Configuration Update      | mfgdl<br>Download and Update MFG configuration.<br>(feed it with 'MFG image file')                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Firmware Update           | fwdl<br>Download and update firmware                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Display info for all phys | phyinfo [help edfb power cable]<br>[up <PhyNum(D)>]<br>- no arguments displays default output<br>- 'help' displays detailed help information<br>- 'edfb' subcommand displays EDFB info<br>- 'power' subcommand displays power mgmt info<br>- 'up' filters to display connected phys only<br>- 'cable' subcommand displays cable mgmt info                                                                                                                                                                                                                                                                                                                              |

| Function               | Command                                                                                                                                                                                                                                                                                                     |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | - <PhyNum> is a valid phy index and filters the output to display info about that phy                                                                                                                                                                                                                       |
| Display or Reset All   | counters [config event reset]                                                                                                                                                                                                                                                                               |
| phy counters           | <ul style="list-style-type: none"> <li>- no arguments displays phy error counters and generic broadcast counters</li> <li>- 'config' subcommand displays phy event configuration</li> <li>- 'event' subcommand displays phy event counters</li> <li>- 'reset' subcommand resets all phy counters</li> </ul> |
| Display Expander       | sasaddr [-d]                                                                                                                                                                                                                                                                                                |
| SAS Address            | ('d': also show virtual ports address)                                                                                                                                                                                                                                                                      |
| Show POST info         | showpost                                                                                                                                                                                                                                                                                                    |
| Show MFG Revision      | showmfg                                                                                                                                                                                                                                                                                                     |
| Show firmware revision | rev                                                                                                                                                                                                                                                                                                         |

## 6 Compatibility Lists

To reach the best performance and avoid system failure, InWin strongly recommends users to choose the components from InWin's compatibility list. All the components are tested in InWin's lab, and assured the components are complementary with InWin's chassis. You can download the latest updated device compatibility list from InWin's website: <https://www.in-win.com/en/ipc-server>

## 7 Technical Support

If you need help with installation or troubleshooting, you can contact your local InWin partner, or send an e-mail to InWin's local contacts for technical assistance.