

**PCI-ENC8G-024U NVMe**  
**2U24Bay JBOF**  
**User's Manual**

Revision 1.2

## Preface

### Change Notice

The information in this document is for information purposes only, it is subject to change without notice ahead.

### SAFETY PRECAUTIONS

Please read this section carefully before proceeding. These precautions explain the correct and safe use of this device, thereby helping to prevent injury to you or others, and also help you to minimize the risk of damaging the device.

### Warnings

Always follow the basic warnings listed here to avoid the risk of serious injury or death from electrical shock, short-circuiting, fire, and other hazards. These warnings include, but are not limited to:

- With the exception of the user-swappable parts, do not attempt to disassemble or modify the enclosure. If this device appears to be malfunctioning, contact Serial Cables Customer Service.
- Do not drop the enclosures or any of its drive modules; dropping or mishandling of the enclosure or drive modules may result in a malfunction.
- Do not insert your fingers or foreign objects inside the enclosure; take particular care when small children are present.
- Do not expose the device to rain, use it near water or containers that contain liquids which might spill into any openings, or in damp or wet conditions.
- If unusual smells, sounds, or smoke come from the device, or if liquids enter it, switch it off immediately and unplug it from the electrical outlet.
- Follow the instructions in this manual carefully; contact Serial Cables Customer Service for additional advice not covered in this User's Guide.

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## 1. INTRODUCTION

### 1.1 Overview

PCI-ENC8G-024U 2U24bay PCIe NVMe JBOF enclosure is designed to provide an external NVMe storage solution. The enclosure is equipped with two PCIe switch controllers, supporting a total of twenty-four (24) high-speed SFF-8639 NVMe SSDs. Each controller integrates the Avago Technologies ExpressFabric Capella 2 PCIe switch PEX9781 with eight external mini-SAS HD connectors, designed to provide PCIe expansion. The total maximum bandwidth is PCIe Gen3 x64 512GT/s and allows up to 8 head-nodes access the NVMe JBOF enclosure.

### 1.2 Package Checklist

Before the installation of the enclosure, verify the items below are included in the package.



A. Enclosure × 1  
24



B. HDD tray (installed in the PCI-ENC8G-024U) ×



C. Hard disk drive mounting screw × 96



D: AC Power cord x2



E. Package of slide rail × 1

Visit the website below that gives instructions on how to install the slide rails on enclosure.

<https://www.youtube.com/watch?v=s41XnpJoAmA>

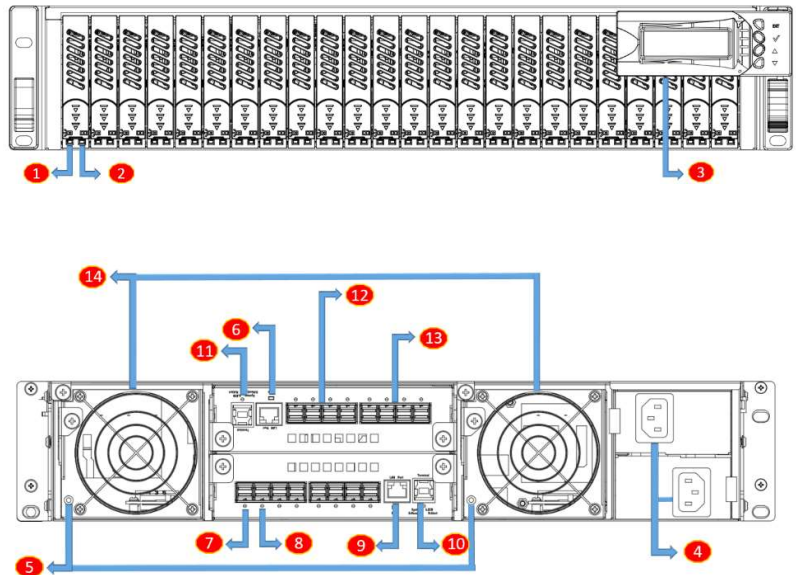
If any of the items listed above is missing or damaged, please contact the sales representative.

## 2. HARDWARE INSTALLATION

This section gives the layout of the panel and describes the procedures for setting up the PCI-ENC8G-024U enclosure.

### 2.1 Panel Layout

1. Activity indicator LED
  - Flash Blue – Access
  - Red – HDD failure
2. SSD presence LED
  - White – Power On
3. LCD module
4. Power cord receptacle
5. Fan status LED
  - Normal – No light
  - Failure – Red
6. Mute button
  - To mute buzzer beeping of enclosure failure
7. Port Link width indication LED
  - One Red LED– configure as one x16 port
  - Two Red LEDs—configure as two x8 ports
8. Upstream/Downstream port indication
  - Flash Blue – Downstream port
  - Blue – Upstream port
9. LAN port
10. USB port
11. System healthy LED
  - Green – Normal
  - Red – Failure events occurred
12. Quad port mini-SAS HD (SFF-8644) connector
13. Quad port mini-SAS HD (SFF-8644) connector
14. Swappable fan



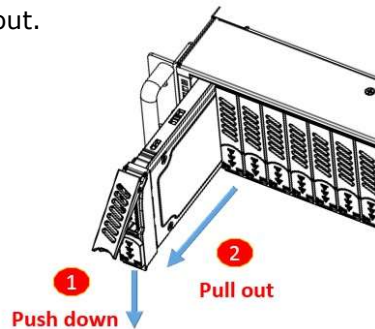
#### Note :

When any one of environmental sensors is abnormal or there is a drive status failure, the buzzer on the PCI-ENC8G-024U switch board will beep. To mute the buzzer, press the mute button near LAN port at the rear of the enclosure. Environmental sensors include:  
Cooling elements (Fan)

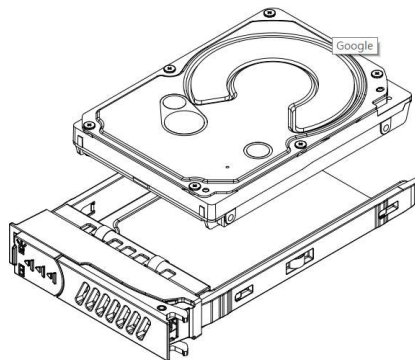
- i. Temperature elements
- ii. Voltage elements
- iii. Current element
- iv. Power Supply element

## 2.2 Enclosure Setup

1. Remove the PCI-ENC8G-024U enclosure from its packaging, and place the enclosure next to PC, server, or workstation.
2. Hold one of the drive trays from the enclosure and push its button downward for the release of the lever until the lever pops out.



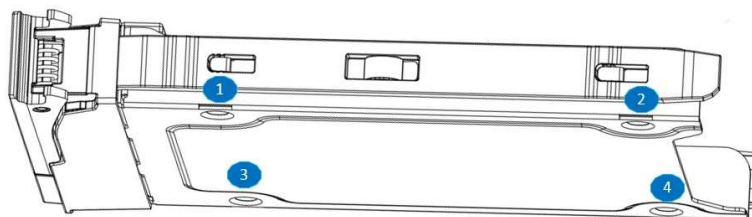
3. Place a drive tray on a flat and level surface, and then attach the drive into the tray.



### **WARNING:**

You must verify the heads of the four screws are level with the drive tray while the drive is attached to the tray; otherwise, a screw may take hold of the tray from the bottom side and prevent you to pull the tray out of the enclosure.

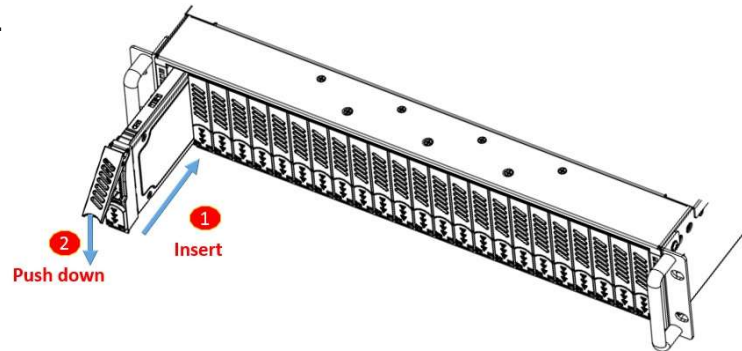
4. Use four of the screws provided, and fasten the drive on the tray. Tighten each screw to fasten the HDD snugly to the drive tray. Do not overly tighten the screws.



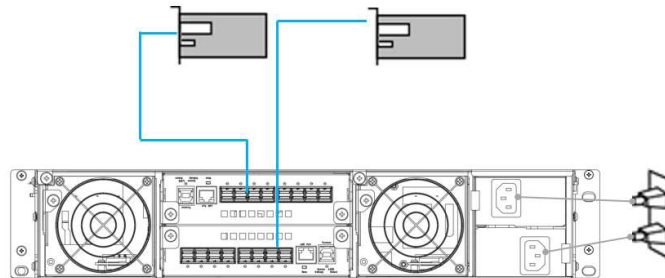
### **WARNING:**

Do not force the levers to close while you insert drive modules into the PCI-ENC8G-024U enclosure. If a lever does not close smoothly, draw out and insert the drive module again, and then press the lever to close.

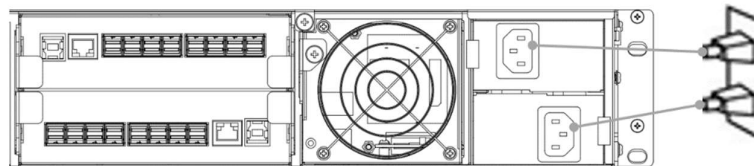
5. Insert the drive module into the PCI-ENC8G-024U enclosure correctly until its lever appears to shut, and then press the lever to close until it clicks to ensure that the drive module is within the enclosure.



6. Repeat steps 2 to 5 for further drives.
7. Connect PCI-ENC8G-024U enclosure to the host interface: An external PCIe host adapter card through an SFF-8644 mini-SAS HD data cable. The connection between the PCI-ENC8G-024U enclosure and the external PCIe host adapter ports is shown as follows:



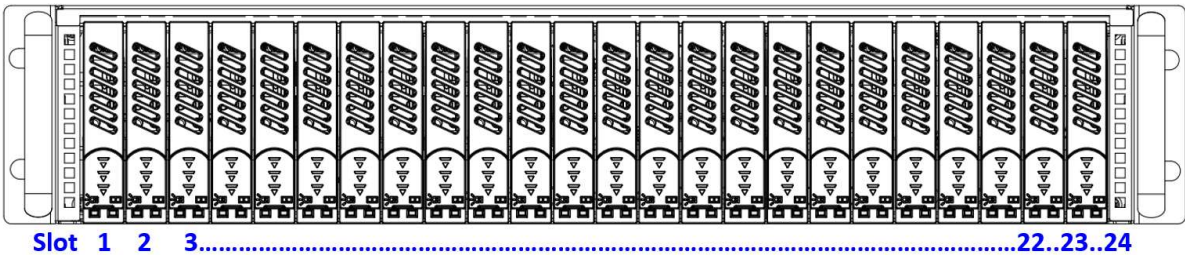
8. Connecting PCI-ENC8G-024U enclosure's USB Port (optional)
  - PCI-ENC8G-024U enclosure's system functions can be managed via a COM port running a VT-100 terminal emulation program, or a VT-100 compatible terminal.
9. The PCI-ENC8G-024U enclosure provides a redundant power supply unit. Connect one end of the two power cords to the two receptacles on rear of PCI-ENC8G-024U enclosure, and then connect the other end of the two power cords to the power outlets.



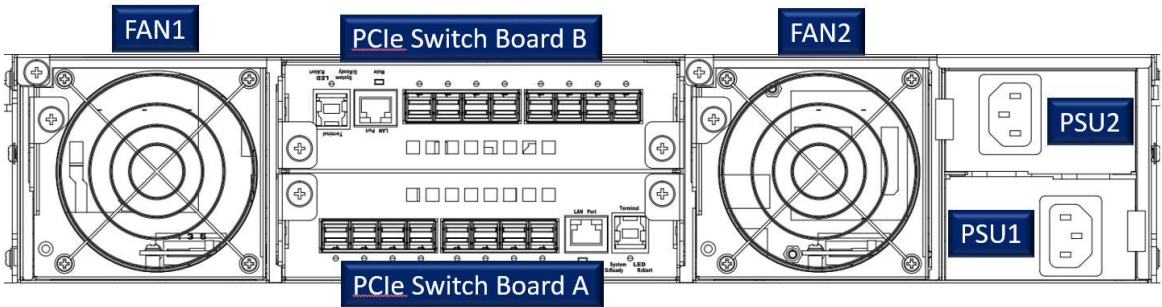
11. After the two power cords are connected, you can power on the PCI-ENC8G-024U enclosure and the computer.

## 2.3 Components location definition

1. Slot location definition



2. PSU, FAN and PCIe switch board definition



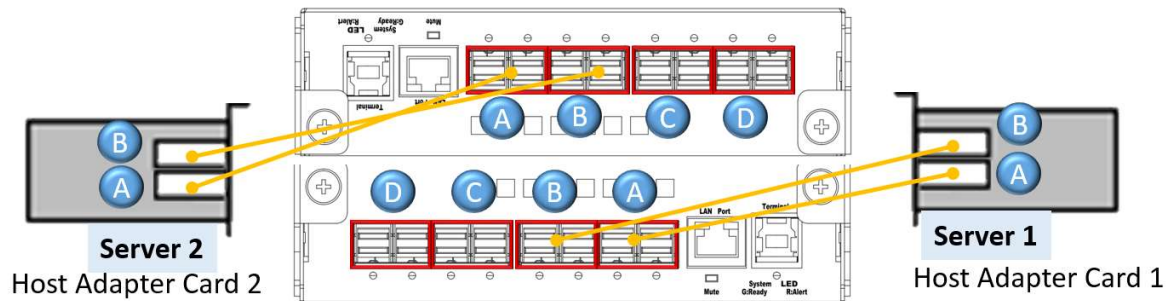
2.4 Switch mode selection



User can utilize the CLI command interface to set the switch's mode. The 2U24bay NVMe JBOF supports 3 modes: base mode, Two VR mode, Four VR mode.

### 1. Mode 1: Base mode, x16 configuration.

#### Connection A:



#### Bandwidth:

PCIe switch board A: PCIe Gen3 x16 128GT/s

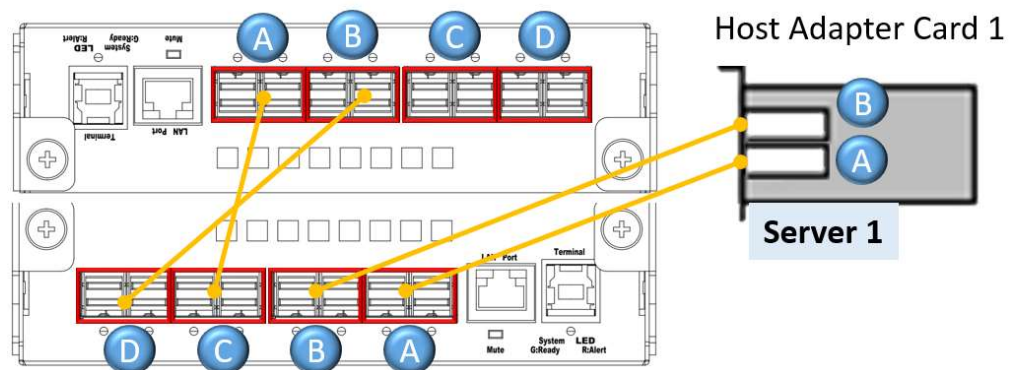
PCIe switch board B: PCIe Gen3 x16 128GT/s

#### NVMe SSD:

Server 1 can access NVMe SSDs in Slot 1 to 12.

Server 2 can access NVMe SSDs in Slot 13 to 24.

#### Connection B:



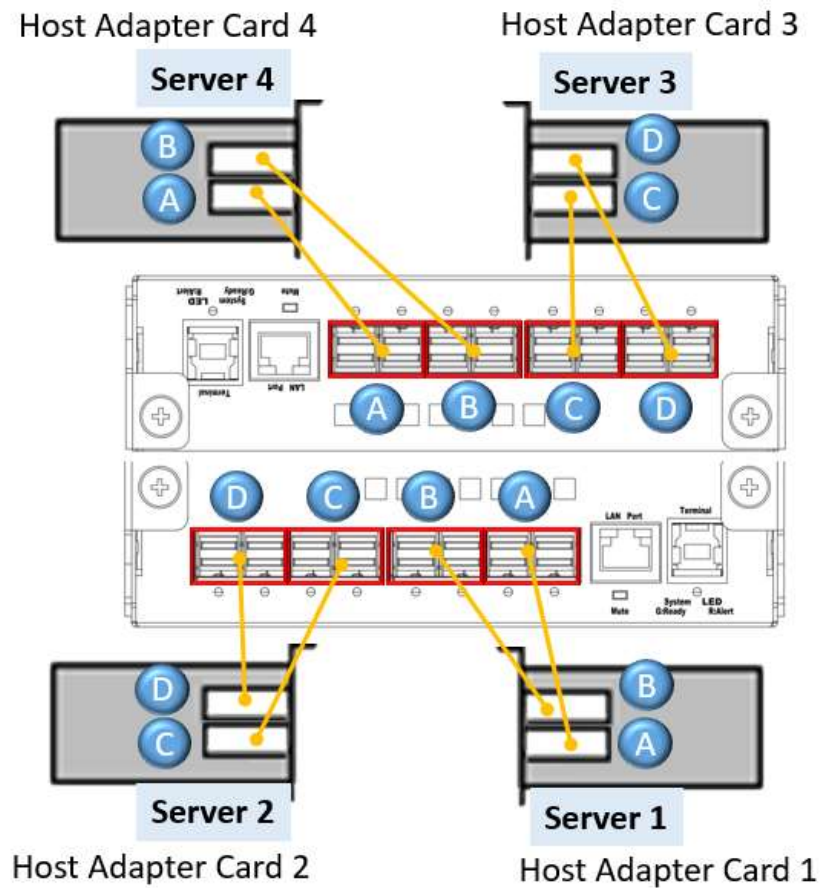
#### Bandwidth:

PCIe switch board A+B: PCIe Gen3 x16 128GT/s

#### NVMe SSD:

Server 1 can access NVMe SSDs in Slot 1 to 24.

## 2. Mode 2: Two VR mode, x16 configuration



### Bandwidth:

PCIe switch board A: PCIe Gen3 x32 256GT/s

PCIe switch board B: PCIe Gen3 x32 256GT/s

### NVMe SSD:

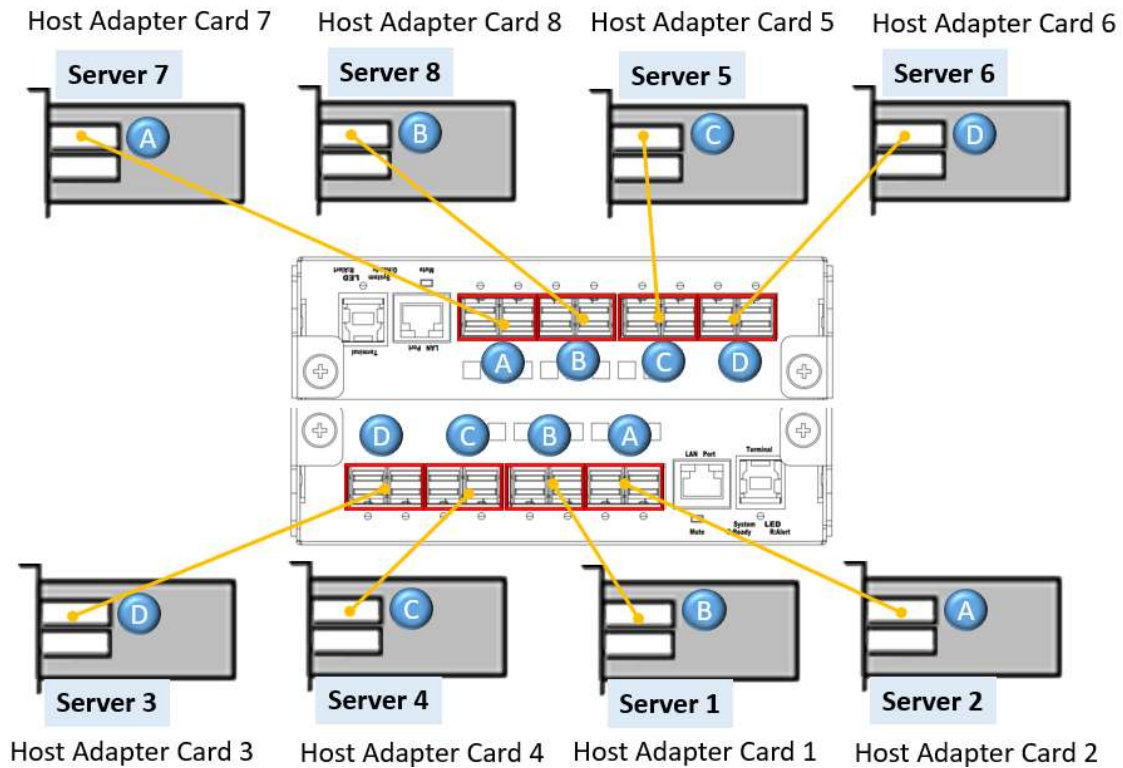
Server 1 can access NVMe SSDs in Slot 1 to 6.

Server 2 can access NVMe SSDs in Slot 7 to 12.

Server 3 can access NVMe SSDs in Slot 13 to 18.

Server 4 can access NVMe SSDs in Slot 19 to 24.

### 3. Mode 3: Four VR mode, x16 configuration



#### Bandwidth:

PCIe switch board A: PCIe Gen3 x32 256GT/s

PCIe switch board B: PCIe Gen3 x32 256GT/s

#### NVMe SSD:

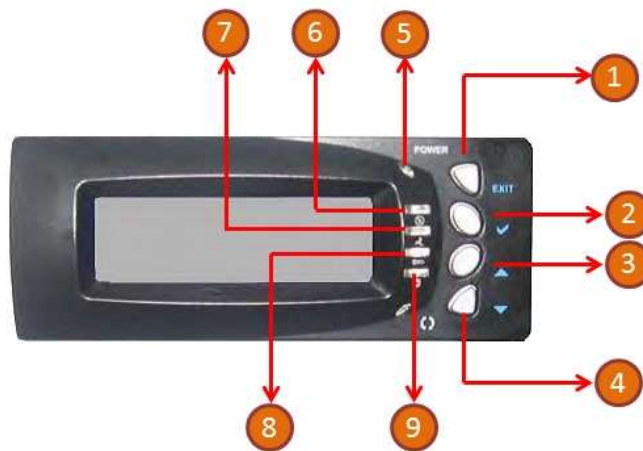
- Server 1 can assess NVMe SSDs in Slot 1 to 3.
- Server 2 can assess NVMe SSDs in Slot 4 to 6.
- Server 3 can assess NVMe SSDs in Slot 7 to 9.
- Server 4 can assess NVMe SSDs in Slot 10 to 12.
- Server 5 can assess NVMe SSDs in Slot 13 to 15.
- Server 6 can assess NVMe SSDs in Slot 16 to 18.
- Server 7 can assess NVMe SSDs in Slot 19 to 21.
- Server 8 can assess NVMe SSDs in Slot 22 to 24.

### 3. LCD configurations

This technical manual provides, in quick reference form, procedures that use the built-in LCD panel to configure and operate the controller. The LCD provides a system of screens with areas for information, status indication, and menus. The LCD screen displays up to two lines at a time of menu items or other information.

#### 3.1 Function key definitions

The four function keys at the front panel of the button perform the following functions:



	Function	Description
1	Exit/Mute Key	1. Power On→press 1s to power on the system. 2. Mute→Press 1s to disable the beeping of system failure events. 3. Return→Press to previous screen.
2	Enter Key ✓	Submit selected icon function (Confirm a selected item)
3	Up Key ▲	Use to scroll the cursor Upward / Rightward
4	Down Key ▼	Use to scroll the cursor Downward / Leftward
5	Standby status LED	OFF – No light ON – Blue
6	PSU status LED	Normal – No light Failure – Red
7	FAN status LED	Normal – No light Failure – Red
8	Temp status LED	Normal – No light Failure – Red
9	Power status LED	OFF – No light ON – Green

## 3.2 Function key definitions

The main menu appears on the LCD screen as shown below:

Use the UP/DOWN to move left and right and highlight a menu item. Press ENT to select the highlighted item. Press the UP/DOWN to browse the selection. Press ESC to return to the previous screen.

Select an option, related information or submenu items, to display beneath it.

The LCD configuration main menu are:

Functions	Description
Fan Info	Show system FANs TACH info.
Temp Info	Show system temperatures info.
PSU Info	Show system PSU info, including voltage, current, FAN info and temperature.
Slot Info	Show link width and speed for NVMe slots.
Port Info	Show link width and speed for ports of PCIe switch board.
Ethernet IP Info	Show Ethernet port info of PCIe switch board.
Firmware Upgrade	Step1: Enter password Step2: Choose switch board A/B, notify PCIe switch board upgrade FW.
Firmware Version	Show all FW versions, including LCD and PCIe switch boards.
System Power OFF	Enter password (default is "00000000") -> power off
Set Password	Step1: Enter old password Step2: Enter New password Step3: Verify new password LCD displays new password been changed

## 4. CLI MANAGER

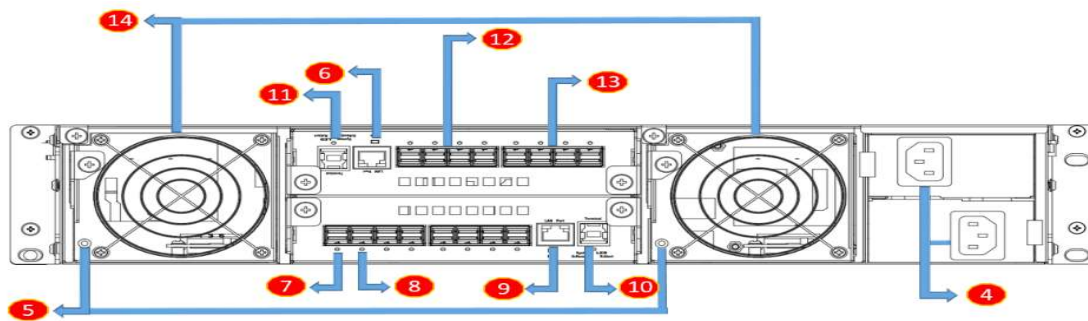
This Command Line Interface (CLI) is provided for you to manage the NVMe controller functions. The CLI is useful in environments where a graphical user interface (GUI) is not available.

### • Location of USB Port

NVMe JBOF enclosure uses the USB port as the serial port interface. Please use the USB type A male to Type B male cable to connect switch controller to PC and operation system will detect a new "USB-to-Serial COM Port". Please use this serial port to configure the switch controller.

Note: USB-to-Serial bridge chip is Prolific PL2303, user can download Windows, Mac OS X driver from <http://www.prolific.com.tw>

USB port location: 10



### • Establishing the Connection for the USB Port

The CLI function can be done by using an ANSI/VT-100 compatible terminal emulation program. You must complete the appropriate installation procedure before proceeding with the CLI function. Whichever terminal emulation program is used must support the XMODEM file transfer protocol.

## 4.1 Start-up VT100 Screen

By connecting a VT100 compatible terminal, or a PC operating in an equivalent terminal emulation mode, all CLI administration functions can be exercised from the VT100 terminal.

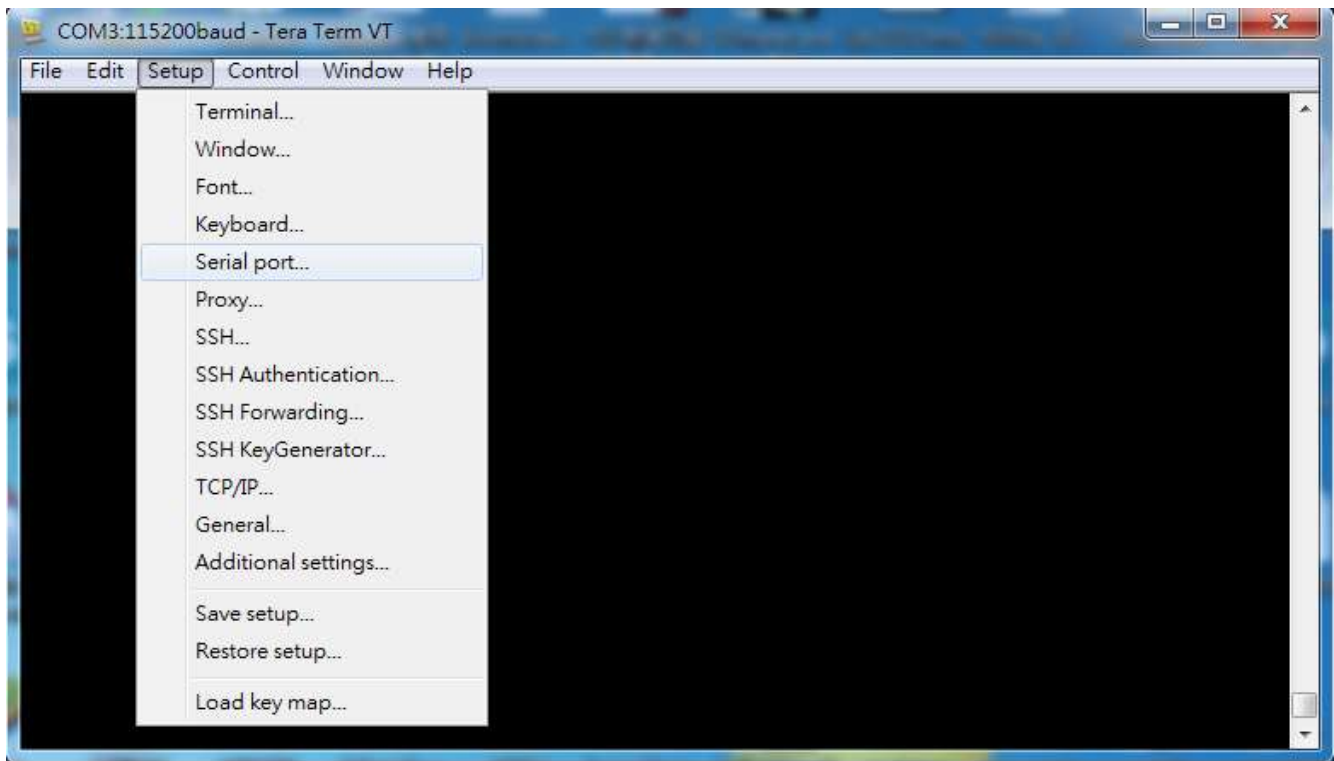
There are a wide variety of Terminal Emulation packages, but for the most part they should be very similar. The following setup procedure is an example setup VT100 Terminal in Windows 7 system using Tera Term 4.83 (a VT100 Terminal Emulation program and it's an open-source, free, software implemented, Terminal Emulator program).

**Note: If you have encountered an issue with newer version of Tera Term, we recommend you to use old version Tera Term. (4.83 or older version)**

**Step 1.** Install and launch Tera Term application (or Hyper Terminal requires version 3.0 or higher).



**Step 2:** To ensure proper communications between NVMe JBOF controller and the VT100 Terminal emulation, please configure the VT100 Terminal emulation settings to the values shown below:



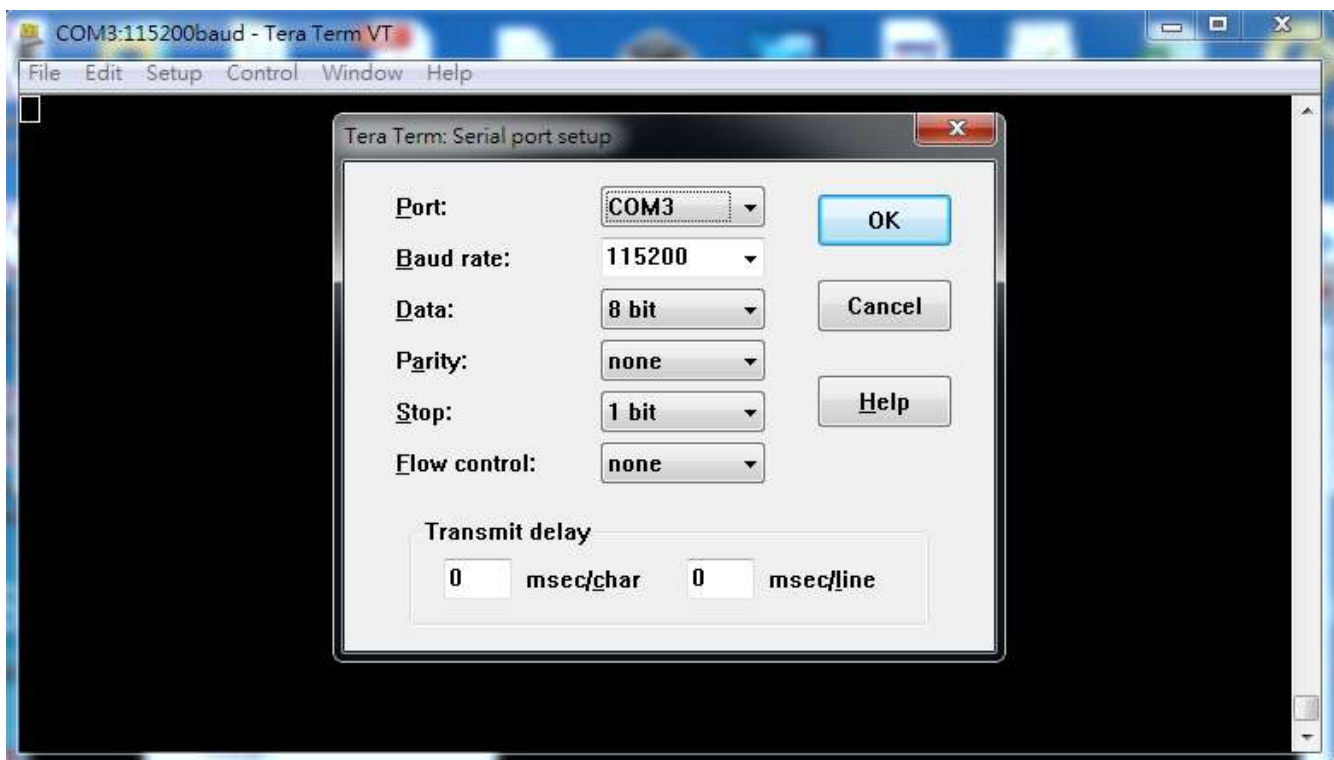
For "Port", select COM3 in this example. (Depend on which COM port used on Host)

For "Baud rate", select 115200.

For "Data", select 8 bit. For "Parity", select none.

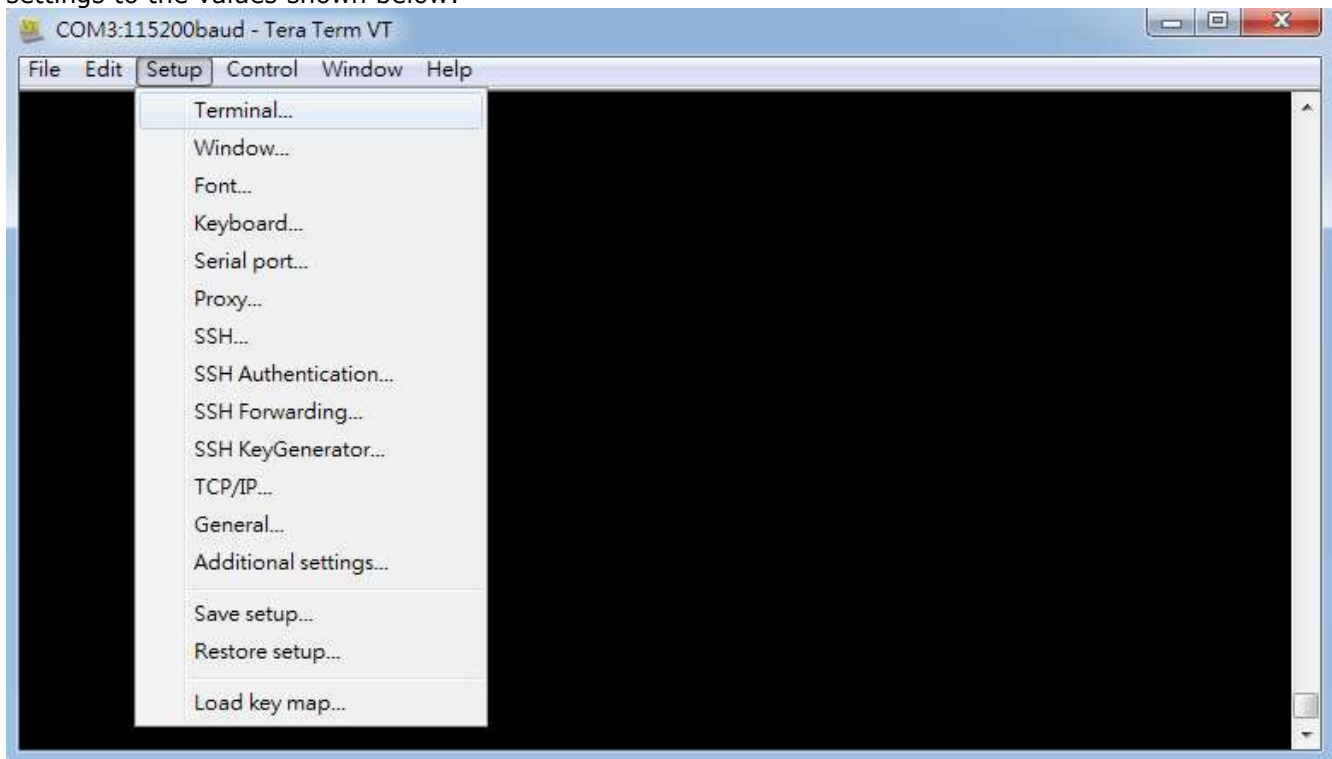
For "Stop", select 1 bit. For "Flow control", select: none.

Click OK when you have finished your selections.

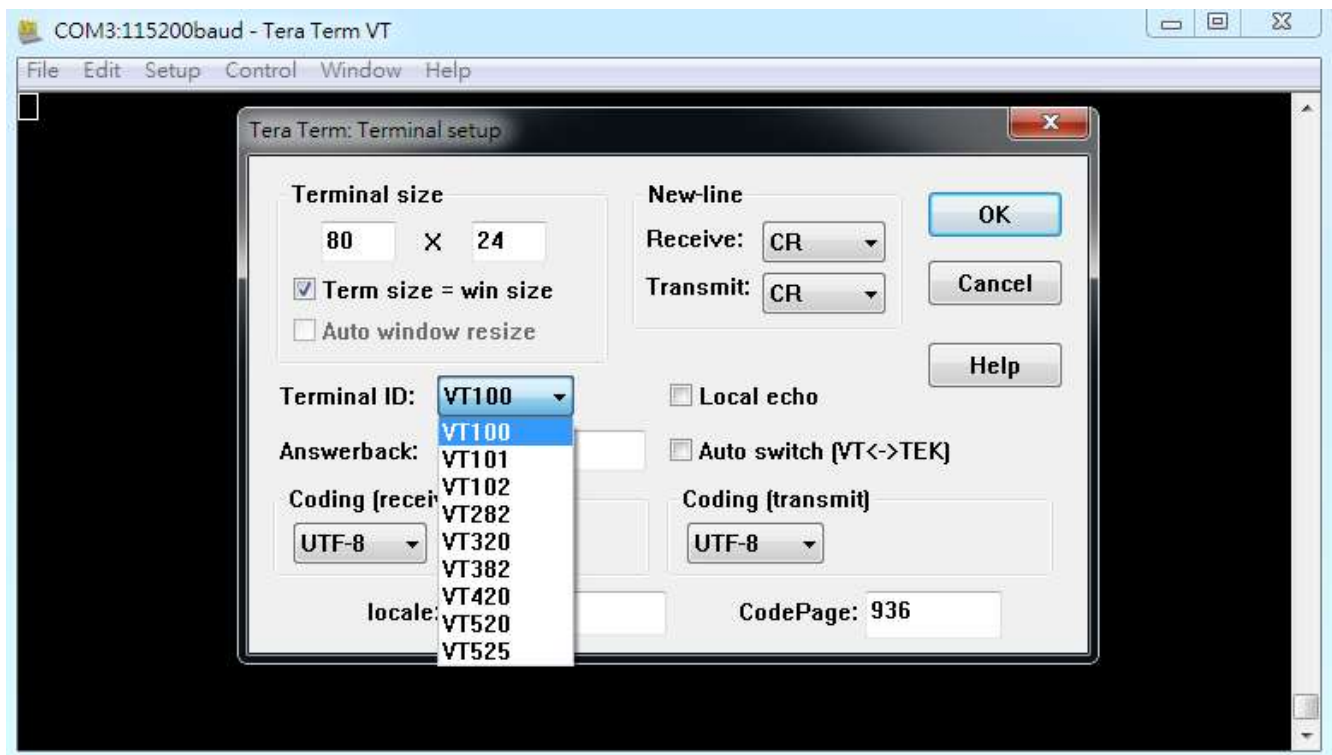




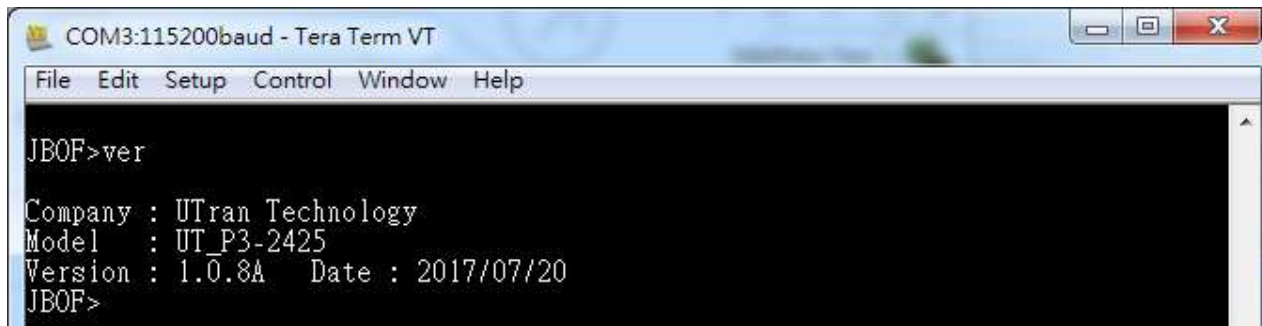
**Step 3:** Configure Terminal emulation type, please configure the VT100 Terminal emulation settings to the values shown below:



For "Terminal ID", select VT100.  
Click OK when you have finished your selections.



**Step 4:** Setup is complete. Type "ver" [Enter] to check terminal, screen will print information shown below:



The screenshot shows a terminal window titled "COM3:115200baud - Tera Term VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", and "Help". The terminal text shows the command "JBOF>ver" and its output:

```
JBOF>ver  
Company : UTran Technology  
Model   : UT_P3-2425  
Version : 1.0.8A   Date : 2017/07/20  
JBOF>
```

### 4.3 CLI Command

This section provides detailed information about NVMe JBOF enclosure's CLI function. All the commands please type in lower case.

- **help Command**

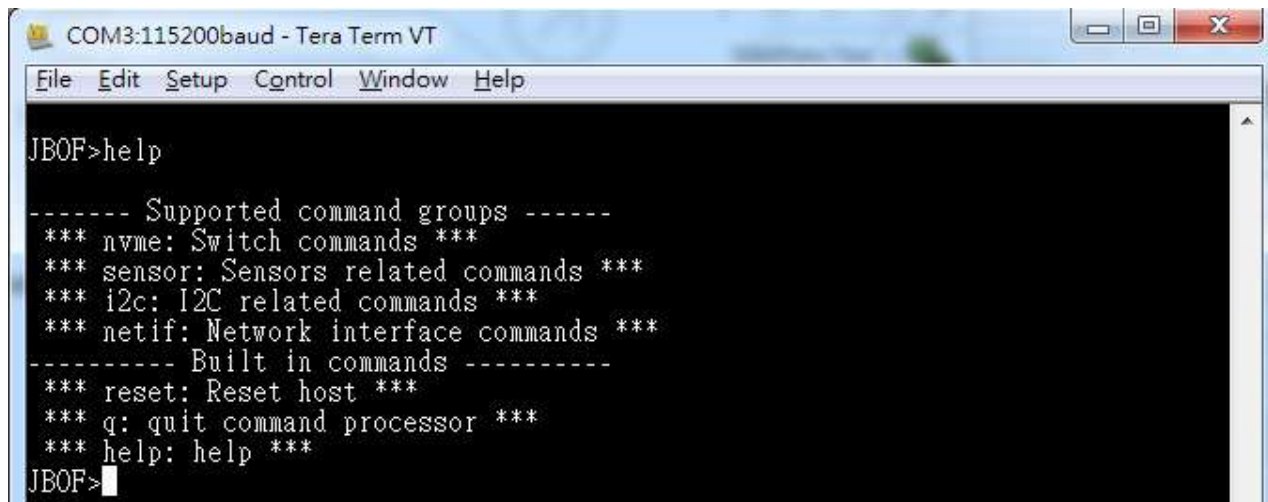
This command provides an line-by-line table of contents, providing brief descriptions of the supported command groups and built-in commands.

You can use "help" to get detail information about the CLI commands summary.

#### Syntax

JBOF>help[Enter]

Example:

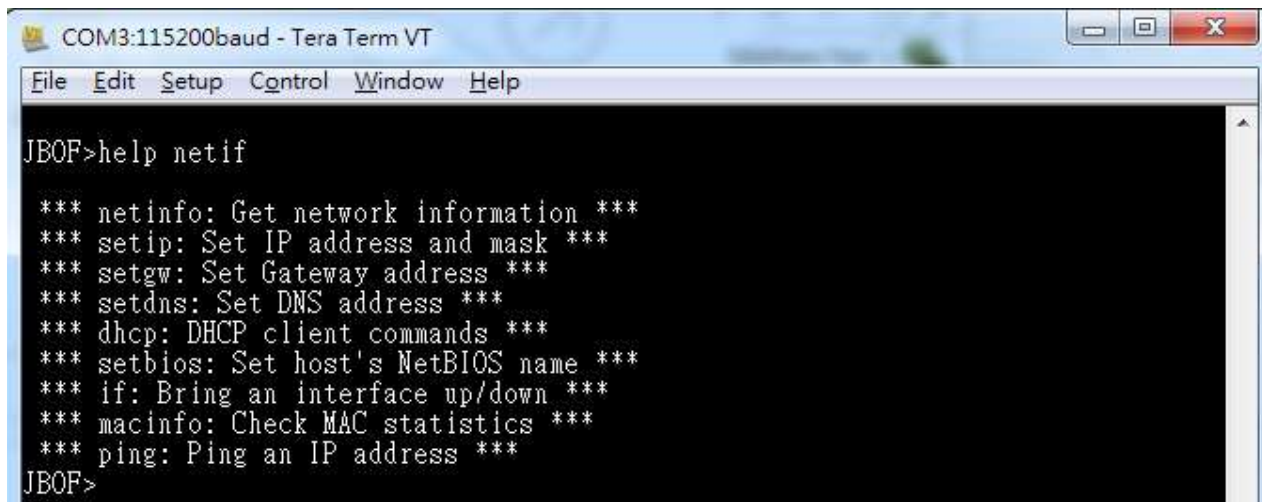


```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>help
----- Supported command groups -----
*** nvme: Switch commands ***
*** sensor: Sensors related commands ***
*** i2c: I2C related commands ***
*** netif: Network interface commands ***
----- Built in commands -----
*** reset: Reset host ***
*** q: quit command processor ***
*** help: help ***
JBOF>
```

There are 4 command groups, if user want to check CLI commands in one of any groups.

Example:

JBOF>help netif [Enter]



A screenshot of a Tera Term VT window titled "COM3:115200baud - Tera Term VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", and "Help". The main text area shows the following output:

```
JBOF>help netif

*** netinfo: Get network information ***
*** setip: Set IP address and mask ***
*** setgw: Set Gateway address ***
*** setdns: Set DNS address ***
*** dhcp: DHCP client commands ***
*** setbios: Set host's NetBIOS name ***
*** if: Bring an interface up/down ***
*** macinfo: Check MAC statistics ***
*** ping: Ping an IP address ***
JBOF>
```

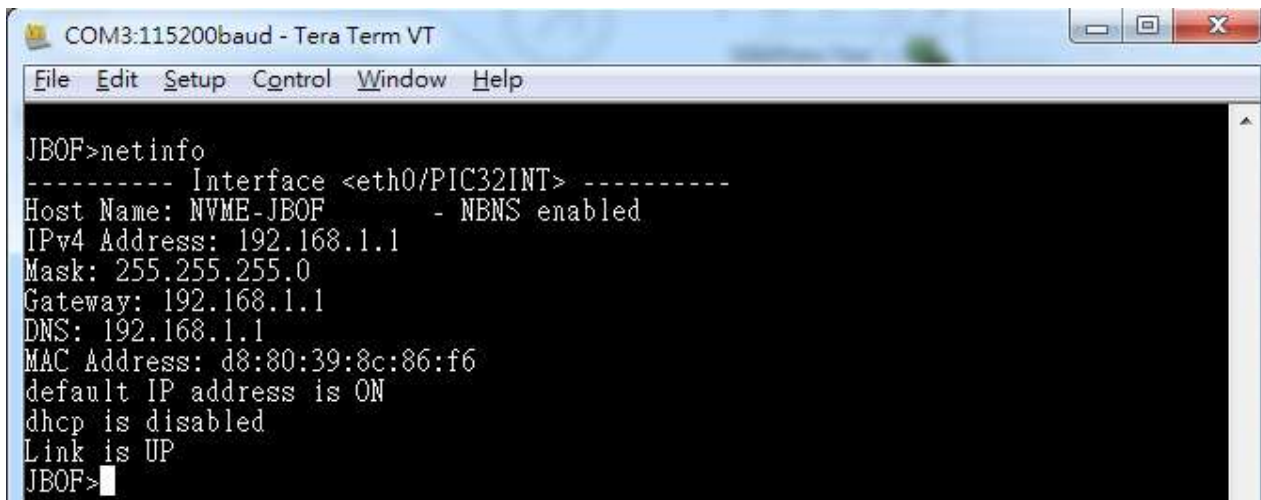
## • netinfo Command

This command provides detailed information of the Ethernet interface.

### Syntax

JBOF>netinfo[Enter]

Example:

A screenshot of a Tera Term VT window titled "COM3:115200baud - Tera Term VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", and "Help". The main area shows the command "JBOF>netinfo" and its output:

```
JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF          - NBNS enabled
IPv4 Address: 192.168.1.1
Mask: 255.255.255.0
Gateway: 192.168.1.1
DNS: 192.168.1.1
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
```

NBNS – NetBIOS Name Service protocol

IPv4 Address – IP address of Interface

Mask – Netmask mask

Gateway – Default Gateway

DNS – IP address of DNS

MAC Address – A unique MAC address of Interface

default IP address On/Off

dhcp function enable/disable

Link status of Interface

## • setip Command

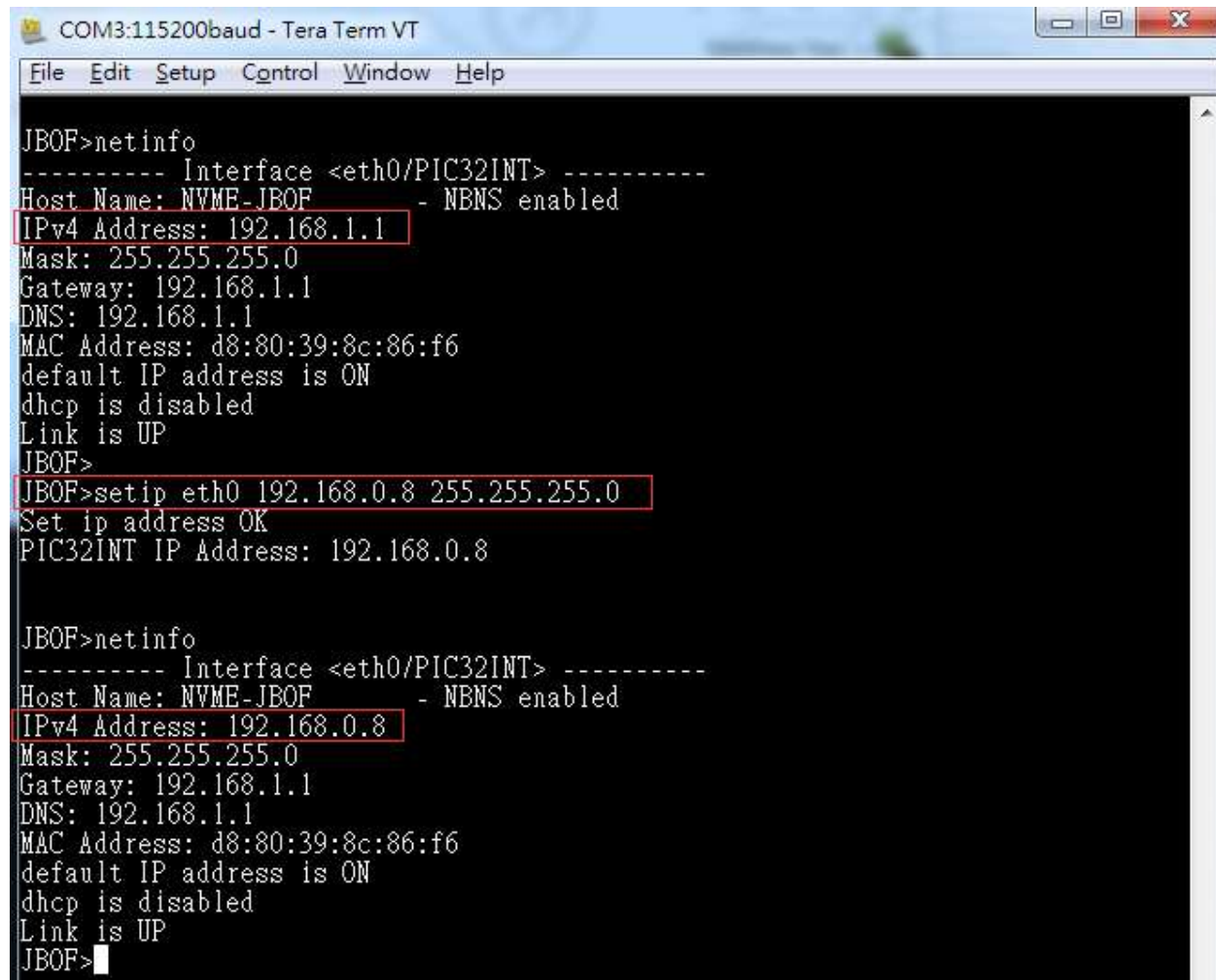
Set IP address and Subnet mask of the Ethernet interface.

### Syntax

Usage: setip <interface> <ipv4/6 address> <ipv4mask/ipv6 prefix len>

Example: Change Ethernet port IP address of interface eth0 to 192.168.0.8

setip eth0 192.168.0.8 255.255.255.0



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help

JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF - NBNS enabled
IPv4 Address: 192.168.1.1
Mask: 255.255.255.0
Gateway: 192.168.1.1
DNS: 192.168.1.1
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
JBOF>setip eth0 192.168.0.8 255.255.255.0
Set ip address OK
PIC32INT IP Address: 192.168.0.8

JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.1.1
DNS: 192.168.1.1
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
```

## • setgw Command

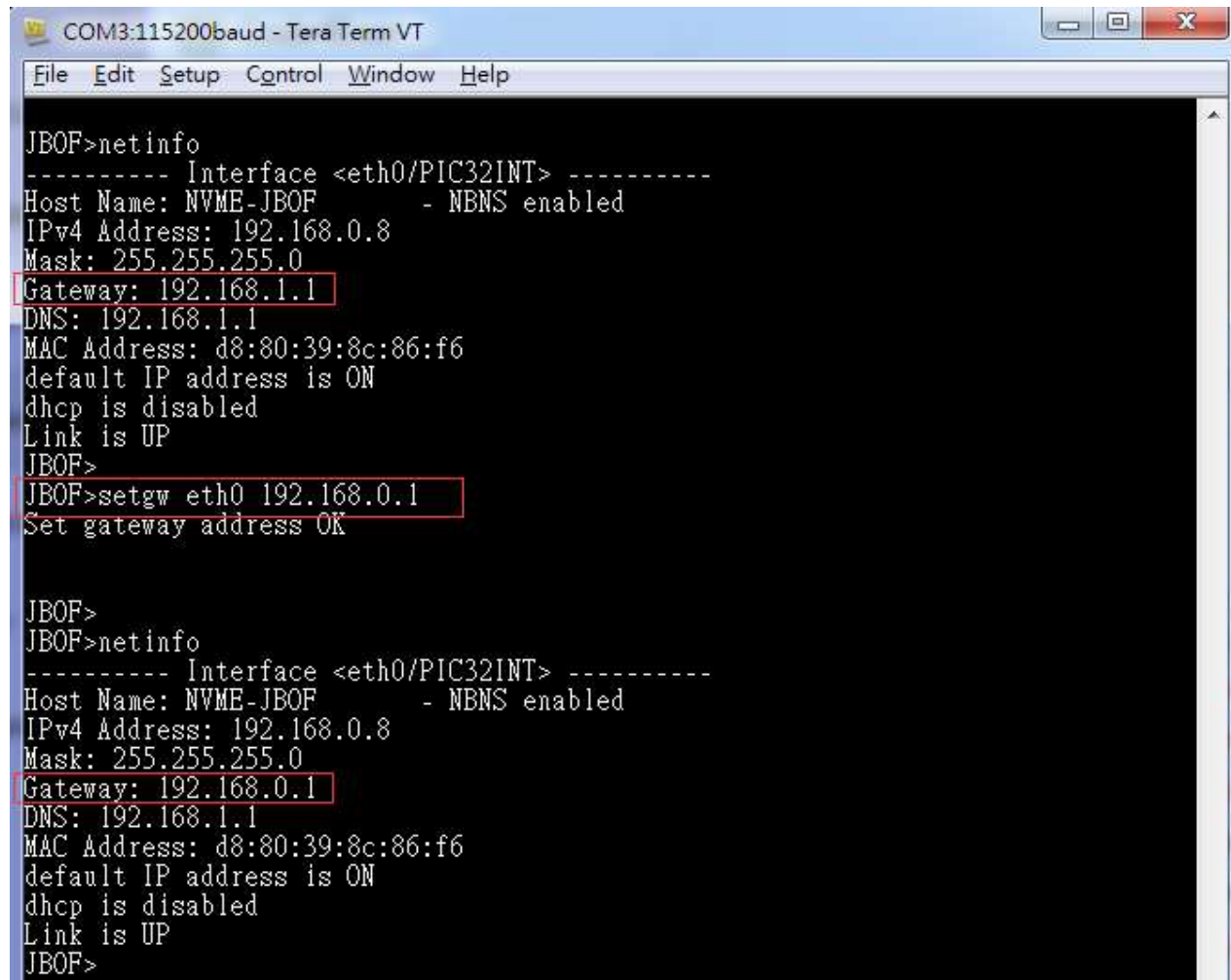
Set gateway IP address

### Syntax

Usage: setgw <interface> <ipv4/6 address> <validTime>

Example: Change gateway IP address of interface eth0 to 192.168.0.1

setgw eth0 192.168.0.1



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help

JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF      - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.1.1
DNS: 192.168.1.1
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
JBOF>setgw eth0 192.168.0.1
Set gateway address OK

JBOF>
JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF      - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.0.1
DNS: 192.168.1.1
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
```

## • setdns Command

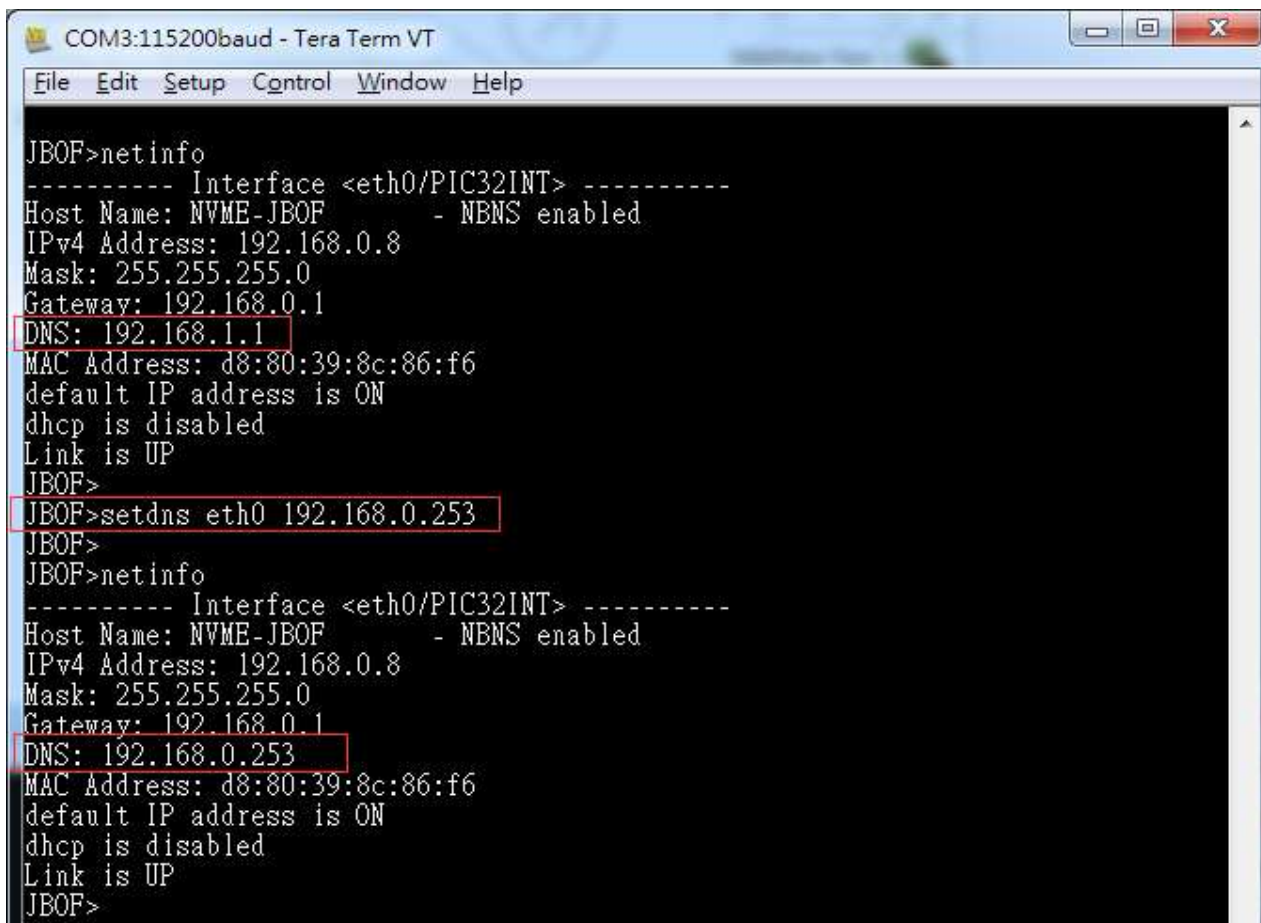
Set DNS IP address.

### Syntax

Usage: setdns <interface> <x.x.x.x>

Example: Change DNS server IP address of interface eth0 to 192.168.0.253

setdns eth0 192.168.0.253



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help

JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF      - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.0.1
DNS: 192.168.1.1
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
JBOF>setdns eth0 192.168.0.253
JBOF>
JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF      - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.0.1
DNS: 192.168.0.253
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
```



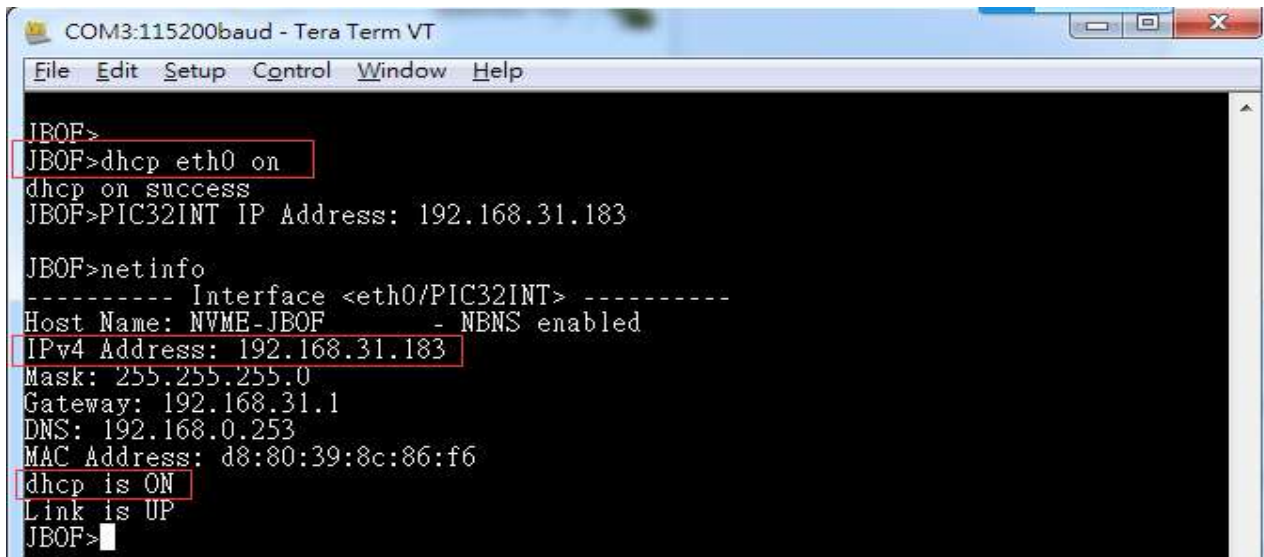
## • dhcp Command

DHCP client command.

### Syntax

Usage: dhcp <interface> <on/off/renew/request/info>

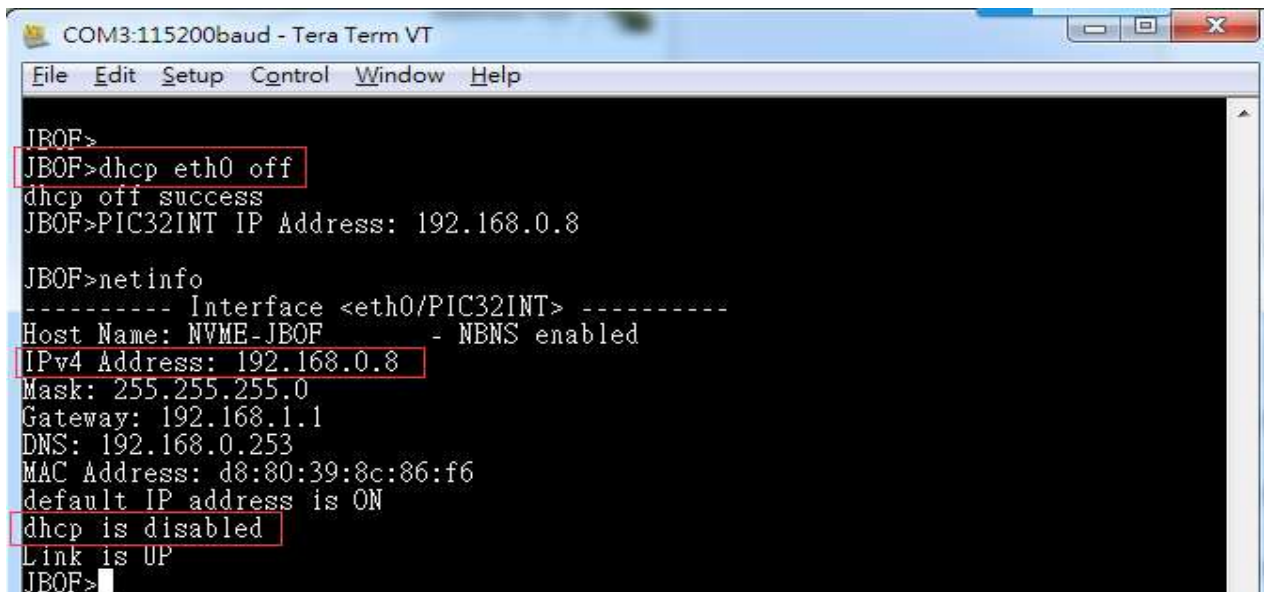
Example: dhcp eth0 on



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>dhcp eth0 on
dhcp on success
JBOF>PIC32INT IP Address: 192.168.31.183

JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF - NBNS enabled
IPv4 Address: 192.168.31.183
Mask: 255.255.255.0
Gateway: 192.168.31.1
DNS: 192.168.0.253
MAC Address: d8:80:39:8c:86:f6
dhcp is ON
Link is UP
JBOF>
```

Example: dhcp eth0 off



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>dhcp eth0 off
dhcp off success
JBOF>PIC32INT IP Address: 192.168.0.8

JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.1.1
DNS: 192.168.0.253
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
```

- **setbios Command**

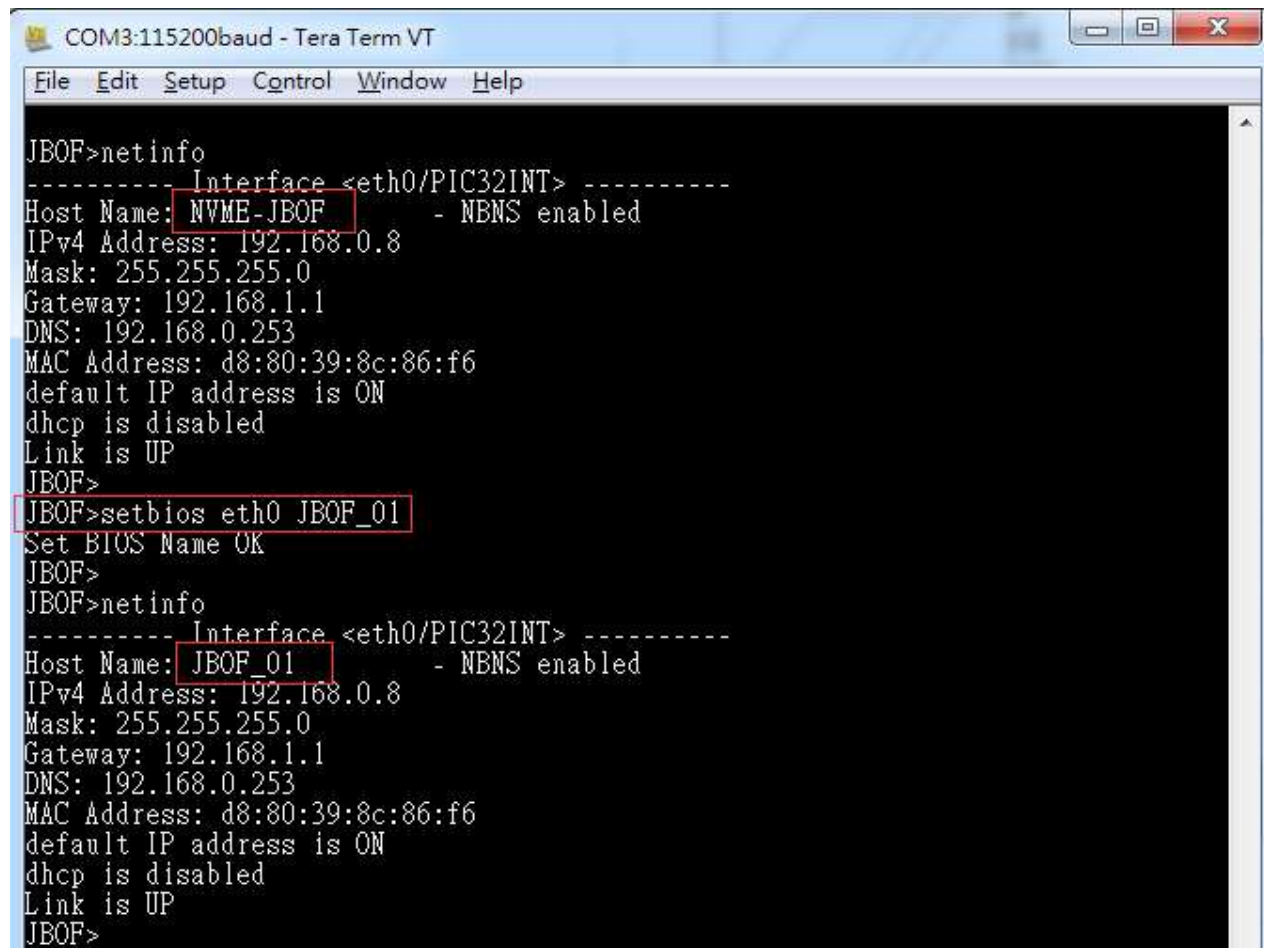
Set host's NetBIOS name.

**Syntax**

Usage: setbios <interface> <string>

Example:

setbios eth0 JBOF\_01

A screenshot of a Tera Term VT window titled "COM3:115200baud - Tera Term VT". The window shows a command-line interface with the following text:

```
JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: NVME-JBOF - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.1.1
DNS: 192.168.0.253
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
JBOF>setbios eth0 JBOF_01
Set BIOS Name OK
JBOF>
JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: JBOF_01 - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.1.1
DNS: 192.168.0.253
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
```

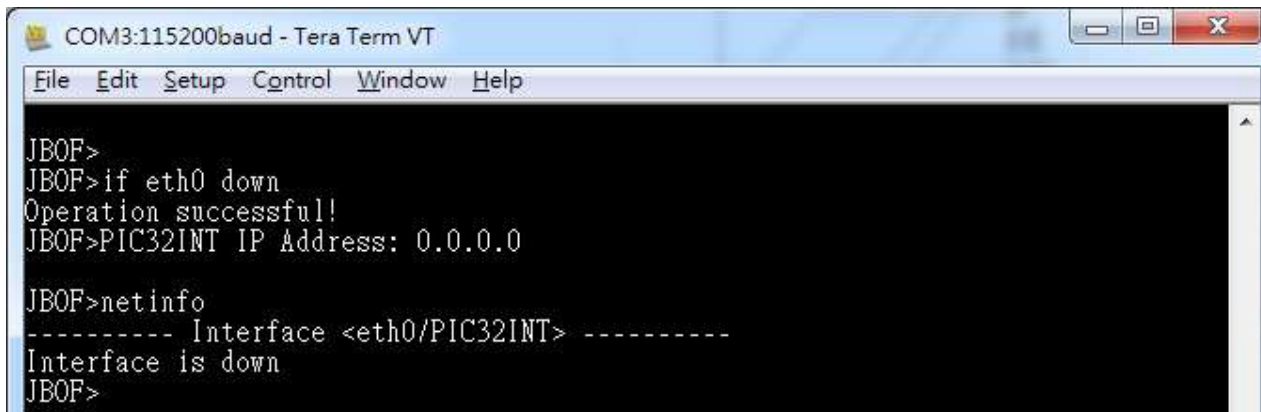
- **if Command**

Ethernet interface enable/disable.

**Syntax**

Usage: if <interface> <down/up>

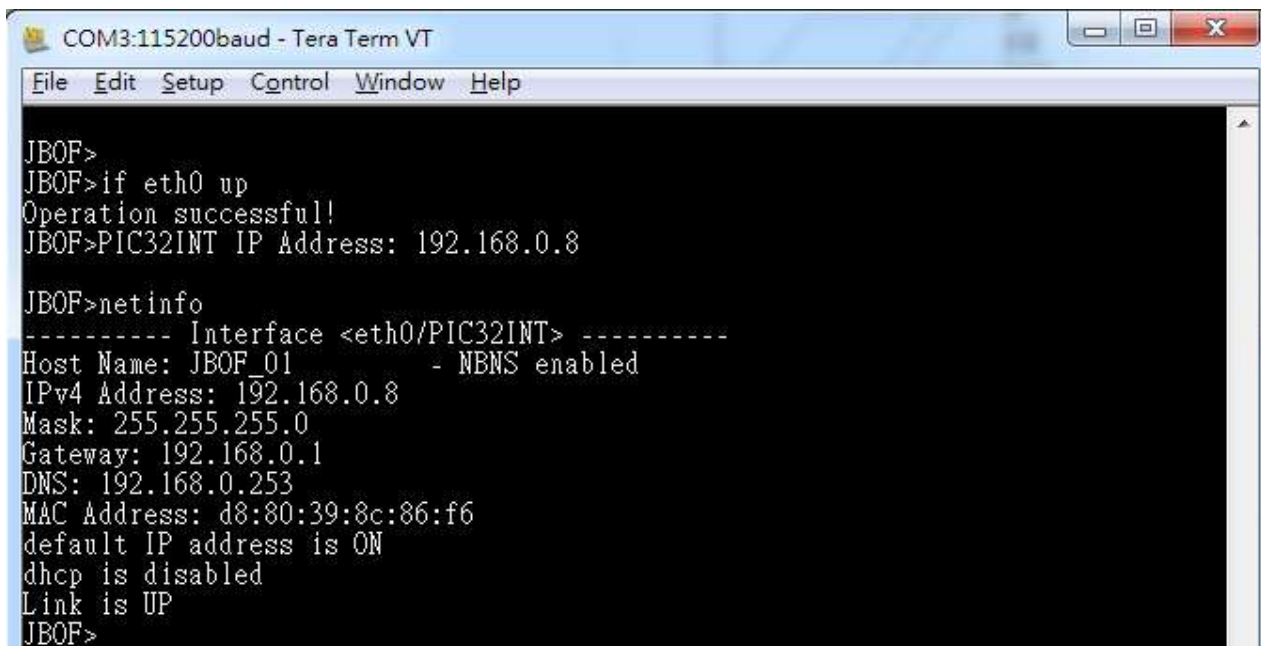
Example: if eth0 down



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>if eth0 down
Operation successful!
JBOF>PIC32INT IP Address: 0.0.0.0

JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Interface is down
JBOF>
```

Example: if eth0 up



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>if eth0 up
Operation successful!
JBOF>PIC32INT IP Address: 192.168.0.8

JBOF>netinfo
----- Interface <eth0/PIC32INT> -----
Host Name: JBOF_01          - NBNS enabled
IPv4 Address: 192.168.0.8
Mask: 255.255.255.0
Gateway: 192.168.0.1
DNS: 192.168.0.253
MAC Address: d8:80:39:8c:86:f6
default IP address is ON
dhcp is disabled
Link is UP
JBOF>
```

- **macinfo Command**

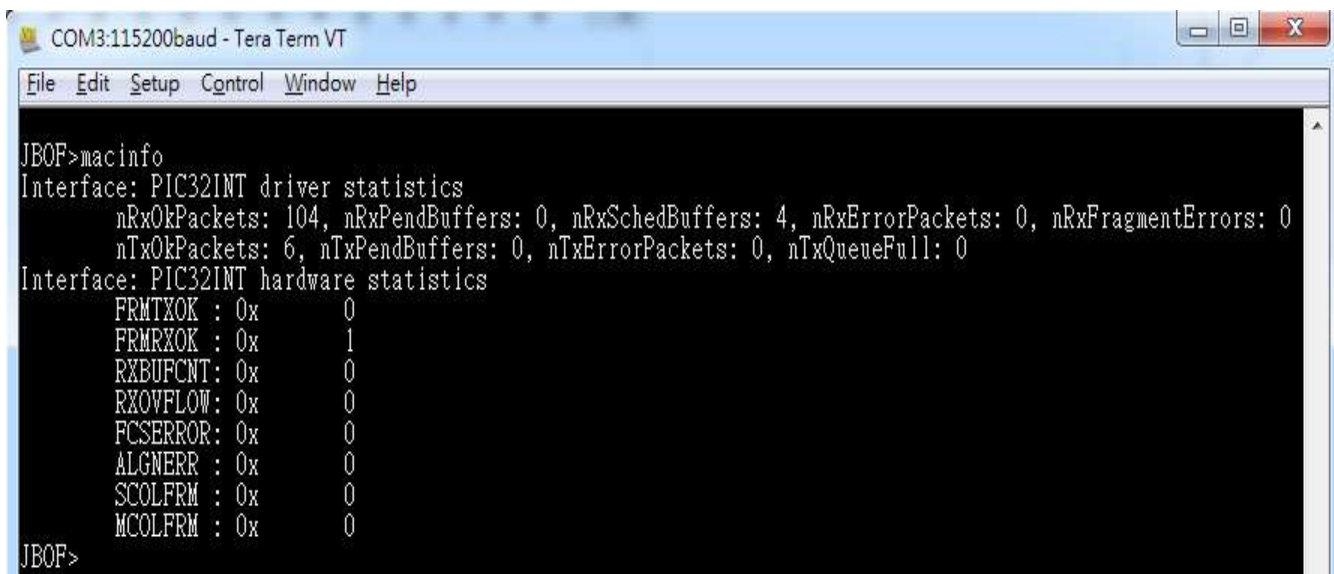
Check MAC statistics.

**Syntax**

Usage: macinfo

Example:

macinfo



The screenshot shows a terminal window titled "COM3:115200baud - Tera Term VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", and "Help". The terminal text shows the command "JBOF>macinfo" being entered. The output is as follows:

```
JBOF>macinfo
Interface: PIC32INT driver statistics
    nRxOkPackets: 104, nRxPendBuffers: 0, nRxSchedBuffers: 4, nRxErrorPackets: 0, nRxFragmentErrors: 0
    nTxOkPackets: 6, nTxPendBuffers: 0, nTxErrorPackets: 0, nTxQueueFull: 0
Interface: PIC32INT hardware statistics
    FRMTXOK : 0x      0
    FRMRXOK : 0x      1
    RXBUPCNT: 0x      0
    RXOVFLOW: 0x     0
    PCSERROR: 0x     0
    ALGNERR : 0x     0
    SCOLFRM : 0x     0
    MCOLFRM : 0x     0
JBOF>
```

- **ping Command**

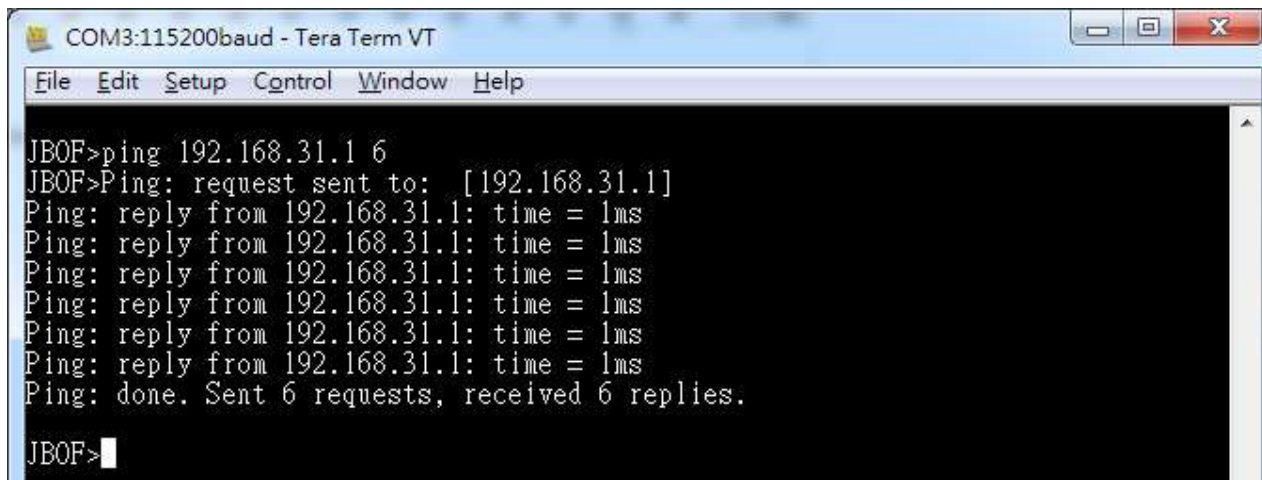
ICMP client ping command.

**Syntax**

Usage: ping <stop> <if> <name/address> <n> <msDelay>

Example: ping IP address 192.168.31.1 6 times

Ping 192.168.31.1 6

A screenshot of a Tera Term VT terminal window. The title bar reads "COM3:115200baud - Tera Term VT". The menu bar includes "File", "Edit", "Setup", "Control", "Window", and "Help". The terminal text shows a user entering the command "JBOF>ping 192.168.31.1 6". The output shows "JBOF>Ping: request sent to: [192.168.31.1]" followed by six lines of "Ping: reply from 192.168.31.1: time = 1ms". The final line of output is "Ping: done. Sent 6 requests, received 6 replies." The prompt "JBOF>" is visible at the bottom with a cursor.

### • **showslot Command**

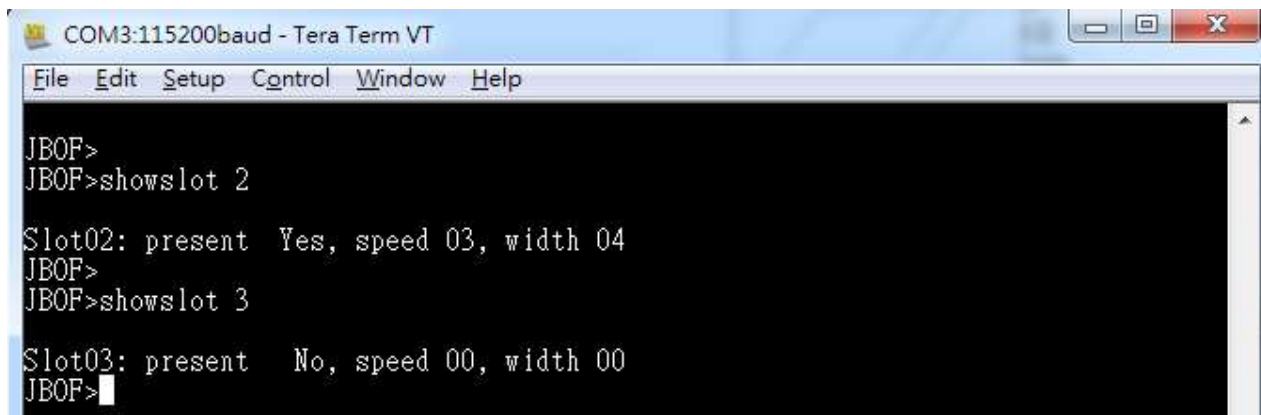
This command is for displaying link speed and link width information of a specific NVMe drive slot.

#### **Syntax**

Usage: showslot slot(D)

Example: Show link speed and link width of slot 2, 3

Note: There is one Gen3 x4 NVMe SSD installed in Slot02

A screenshot of a Tera Term VT window titled 'COM3:115200baud - Tera Term VT'. The window has a menu bar with 'File', 'Edit', 'Setup', 'Control', 'Window', and 'Help'. The terminal area shows the following text:

```
JBOF>  
JBOF>showslot 2  
  
Slot02: present Yes, speed 03, width 04  
JBOF>  
JBOF>showslot 3  
  
Slot03: present No, speed 00, width 00  
JBOF>
```

present:      Yes -> drive presence in slot  
              No -> no drive presence in slot

speed :        01->Gen1, 02->Gen2, 03->Gen3

width :        00->link down, 02-> x2, 04-> x4

- **ssdpwr Command**

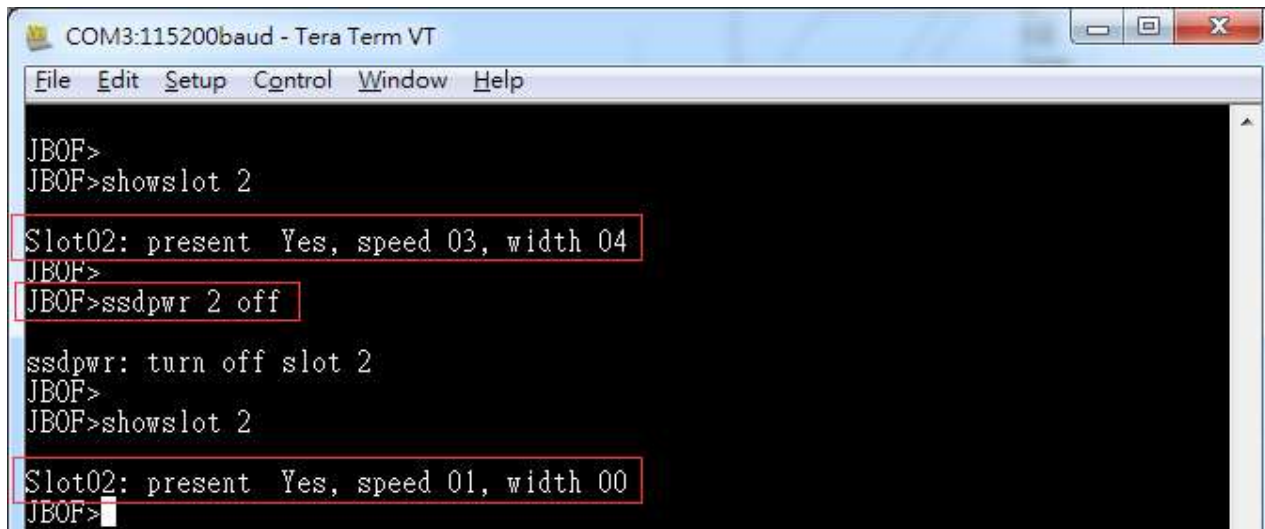
This command is for controlling the power of each NVMe drive slot.

**Syntax**

Usage: ssdpwr slot(D) on/off

slot(D) : slot number should be 1 ~ 12

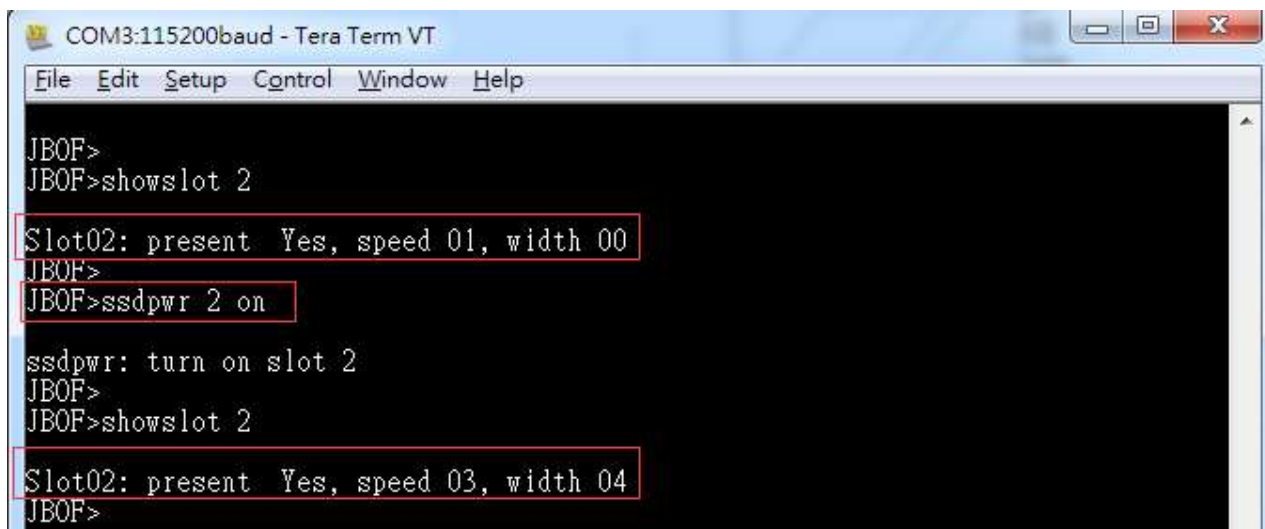
Example: There is one Gen3 x4 NVMe SSD installed in Slot02 and turn off power of Slot02



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>showslot 2
Slot02: present Yes, speed 03, width 04
JBOF>
JBOF>ssdpwr 2 off
ssdpwr: turn off slot 2
JBOF>
JBOF>showslot 2
Slot02: present Yes, speed 01, width 00
JBOF>
```

After turn off power of Slot02, drive presence but link is down (speed 01 width is 00)

Example: Turn on power of Slot02



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>showslot 2
Slot02: present Yes, speed 01, width 00
JBOF>
JBOF>ssdpwr 2 on
ssdpwr: turn on slot 2
JBOF>
JBOF>showslot 2
Slot02: present Yes, speed 03, width 04
JBOF>
```

After turn on power of Slot02, link is back (Gen3 x4)

- **buz Command**

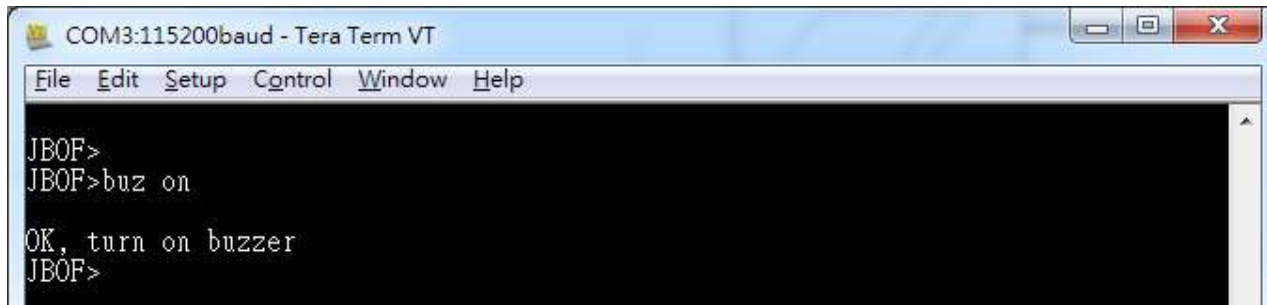
This command is for controlling the buzzer on the switch controller board.

**Syntax**

Usage: buz on/off

Example: Turn on buzzer

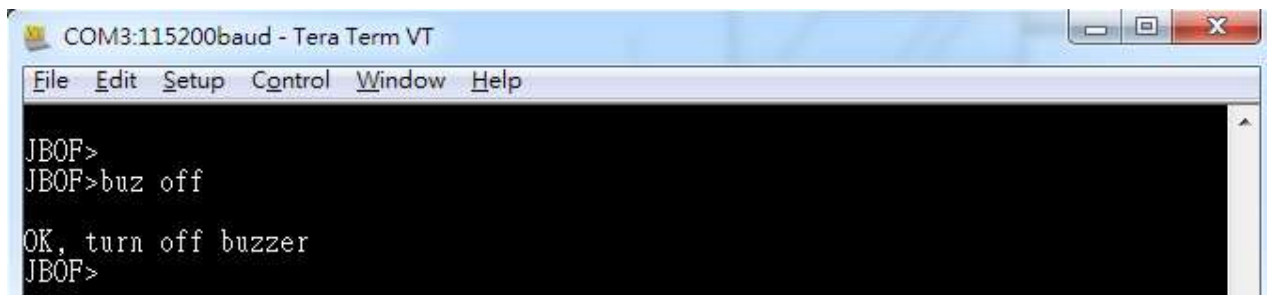
buz on

A screenshot of a Tera Term VT terminal window. The title bar reads "COM3:115200baud - Tera Term VT". The menu bar includes File, Edit, Setup, Control, Window, and Help. The terminal text shows the prompt "JBOF>" followed by the command "JBOF>buz on". The response "OK, turn on buzzer" is displayed on the next line, followed by another "JBOF>" prompt.

```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>buz on
OK, turn on buzzer
JBOF>
```

Example: Turn off buzzer

buz off

A screenshot of a Tera Term VT terminal window. The title bar reads "COM3:115200baud - Tera Term VT". The menu bar includes File, Edit, Setup, Control, Window, and Help. The terminal text shows the prompt "JBOF>" followed by the command "JBOF>buz off". The response "OK, turn off buzzer" is displayed on the next line, followed by another "JBOF>" prompt.

```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>buz off
OK, turn off buzzer
JBOF>
```



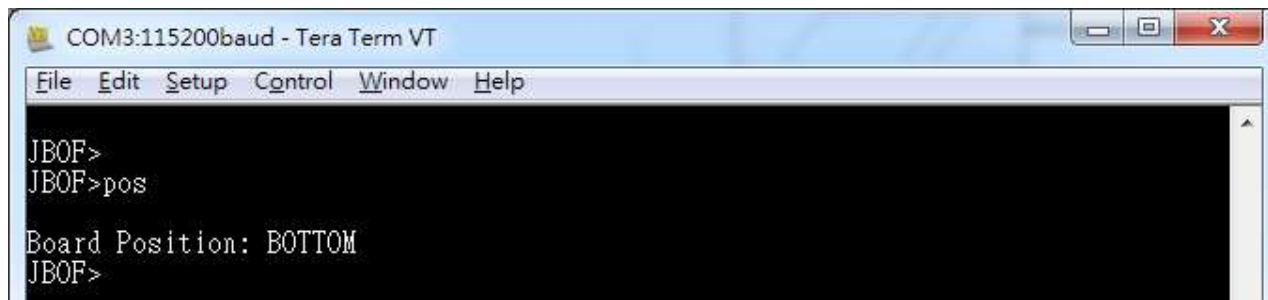
- **pos Command**

This command is for showing position information on the switch controller board in system.

**Syntax**

Usage: pos

Example: Check controller board position

A screenshot of a Tera Term VT terminal window. The title bar reads "COM3:115200baud - Tera Term VT". The menu bar includes "File", "Edit", "Setup", "Control", "Window", and "Help". The terminal text shows the prompt "JBOF>" followed by the command "JBOF>pos". The output is "Board Position: BOTTOM", followed by another "JBOF>" prompt.

```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>pos
Board Position: BOTTOM
JBOF>
```

### • showport Command

This command is for displaying link speed and link width information of all NVMe drive slots.

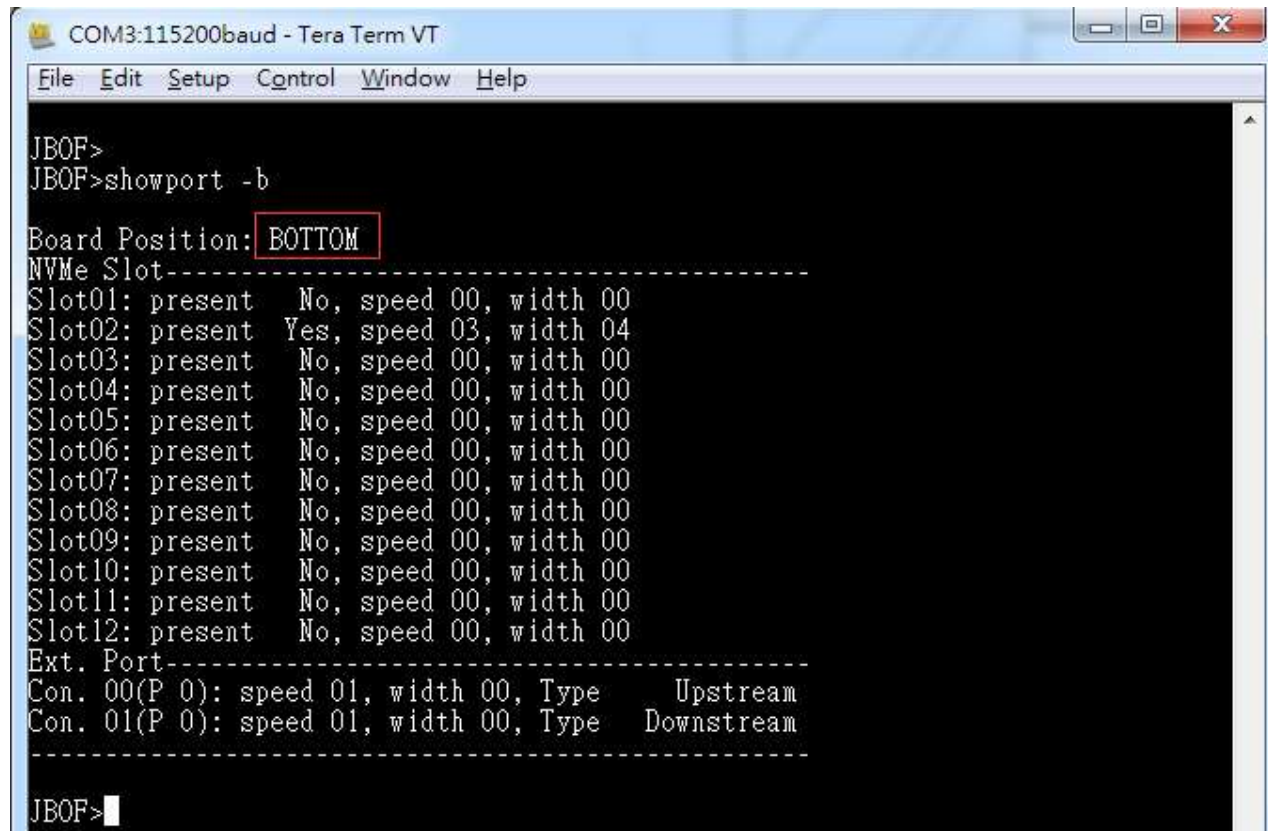
#### Syntax

Usage: showport <-t -b>

-t: Top controller board, -b: Bottom controller board

Example: Show link speed and link width of bottom controller board

showport -b



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>showport -b
Board Position: BOTTOM
NVMe Slot-----
Slot01: present  No, speed 00, width 00
Slot02: present  Yes, speed 03, width 04
Slot03: present  No, speed 00, width 00
Slot04: present  No, speed 00, width 00
Slot05: present  No, speed 00, width 00
Slot06: present  No, speed 00, width 00
Slot07: present  No, speed 00, width 00
Slot08: present  No, speed 00, width 00
Slot09: present  No, speed 00, width 00
Slot10: present  No, speed 00, width 00
Slot11: present  No, speed 00, width 00
Slot12: present  No, speed 00, width 00
Ext. Port-----
Con. 00(P 0): speed 01, width 00, Type   Upstream
Con. 01(P 0): speed 01, width 00, Type   Downstream
-----
JBOF>
```

## • setmode Command

This command is for setting configuration of the switch controller board.

### Syntax

Usage: setmode mode(D) option(D)

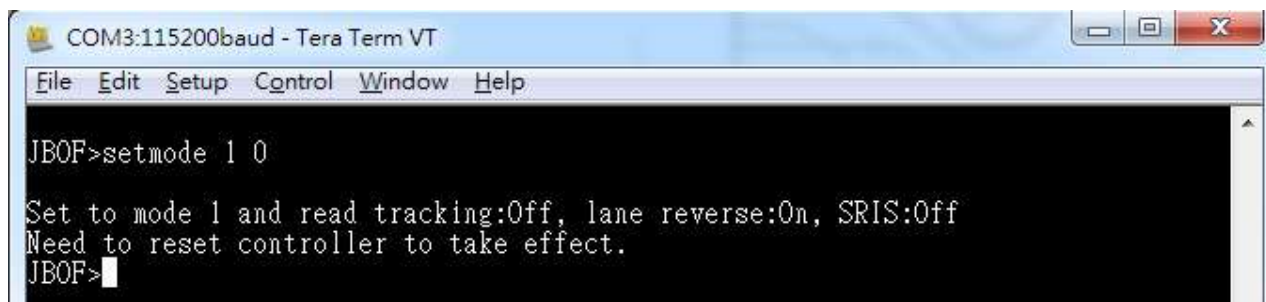
mode 1 ~ 3

- 1 : Base mode
- 2 : 2 Virtual switch
- 3 : 4 Virtual switch

option 0 ~ 2

- 0 : read tracking **disable**, lane reverse **enable**, SRIS **disable**
- 1 : read tracking **enable**, lane reverse **disable**, SRIS **disable**
- 2 : read tracking **disable**, lane reverse **enable**, SRIS **enable**

Example 1: select mode 1 with read tracking **disable**, lane reverse **enable**, SRIS **disable**



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>setmode 1 0
Set to mode 1 and read tracking:Off, lane reverse:On, SRIS:Off
Need to reset controller to take effect.
JBOF>
```

- **showmode Command**

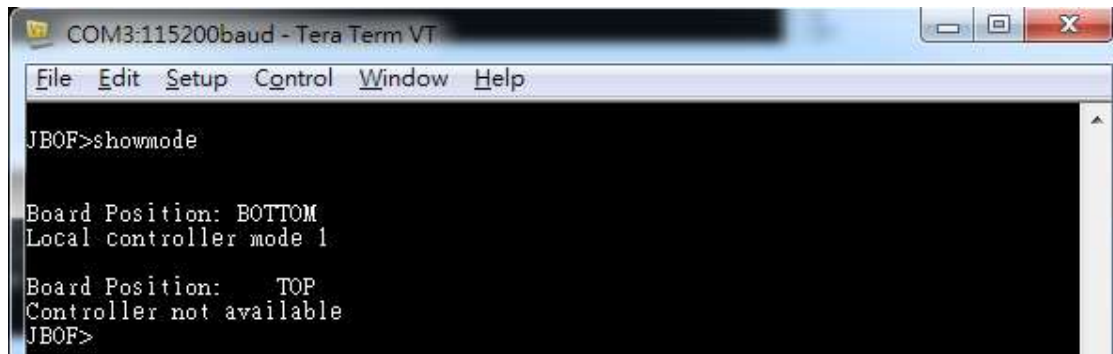
This command is for showing the configuration of each switch controller board in the system.

**Syntax**

Usage: showmode

Example: Show mode information of switch controller board in system (TOP and BOTTOM)

showmode



The screenshot shows a Tera Term VT window titled "COM3:115200baud - Tera Term VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", and "Help". The main text area displays the following output:

```
JBOF>showmode  
  
Board Position: BOTTOM  
Local controller mode 1  
  
Board Position: TOP  
Controller not available  
JBOF>
```

- **ver Command**

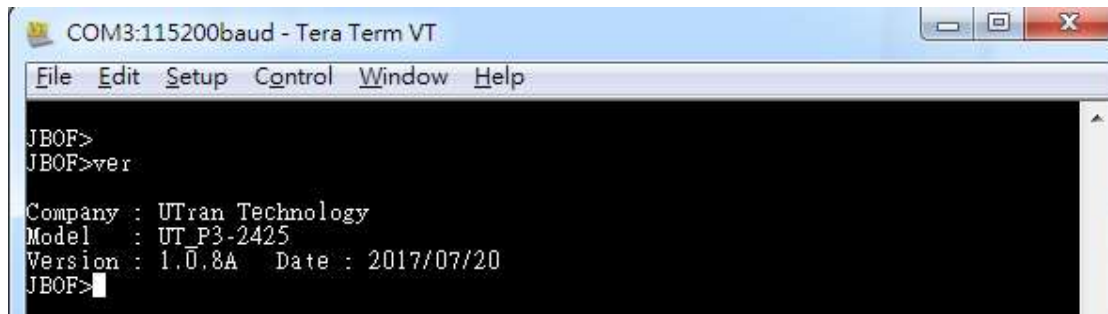
This command is for showing the microcontroller firmware version of the switch controller board.

**Syntax**

Usage: ver

Example:

ver



The screenshot shows a terminal window titled "COM3:115200baud - Tera Term VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", and "Help". The terminal text shows the prompt "JBOF>" followed by the command "JBOF>ver". The output of the command is displayed as follows:

```
Company : UTran Technology
Model   : UT_P3-2425
Version : 1.0.8A   Date : 2017/07/20
JBOF>
```

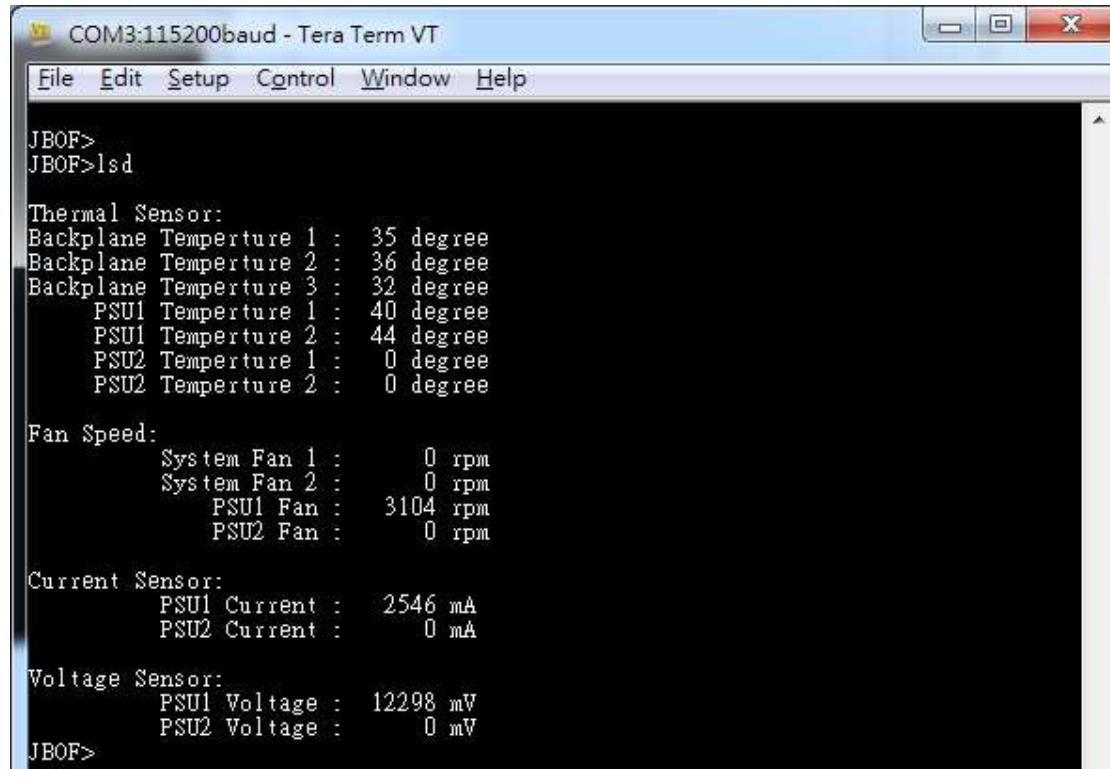
- **Isd Command**

This command is for showing environmental conditions information of the NVMe JBOF system.

**Syntax**

Usage: Isd

Example: Isd



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>Isd
Thermal Sensor:
Backplane Temperture 1 : 35 degree
Backplane Temperture 2 : 36 degree
Backplane Temperture 3 : 32 degree
PSU1 Temperture 1 : 40 degree
PSU1 Temperture 2 : 44 degree
PSU2 Temperture 1 : 0 degree
PSU2 Temperture 2 : 0 degree

Fan Speed:
System Fan 1 : 0 rpm
System Fan 2 : 0 rpm
PSU1 Fan : 3104 rpm
PSU2 Fan : 0 rpm

Current Sensor:
PSU1 Current : 2546 mA
PSU2 Current : 0 mA

Voltage Sensor:
PSU1 Voltage : 12298 mV
PSU2 Voltage : 0 mV
JBOF>
```

(Note: During test, PSU2 and System Fan 1,2 are not installed)

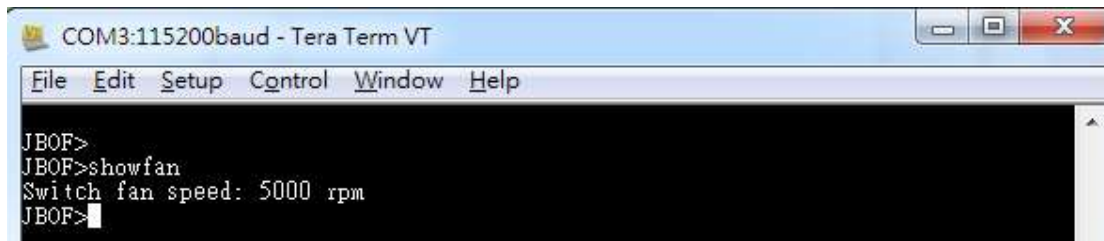
- **showfan Command**

This command is for showing the fan speed information on the switch controller board.

**Syntax**

Usage: showfan

Example: showfan



```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>showfan
Switch fan speed: 5000 rpm
JBOF>
```

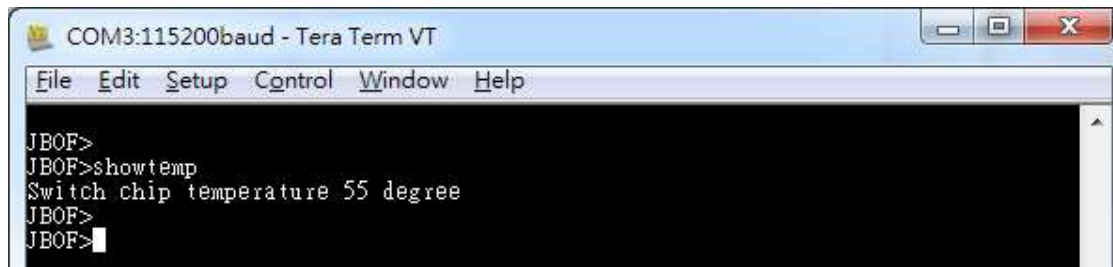
- **showtemp Command**

This command is for showing the internal temperature of PCIe switch chip.

**Syntax**

Usage: showtemp

Example: showtemp

A screenshot of a Tera Term VT terminal window. The title bar reads "COM3:115200baud - Tera Term VT". The menu bar includes "File", "Edit", "Setup", "Control", "Window", and "Help". The terminal text shows the following sequence: "JBOF>", "JBOF>showtemp", "Switch chip temperature 55 degree", "JBOF>", and "JBOF>" with a cursor at the end.

```
COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
JBOF>
JBOF>showtemp
Switch chip temperature 55 degree
JBOF>
JBOF>
```



## 5. Firmware Upgrade

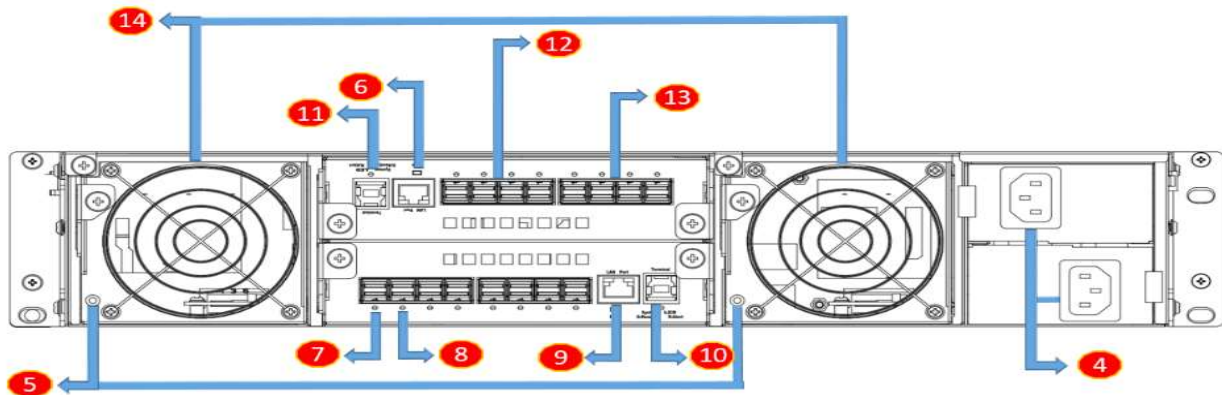
### Enter the firmware upgrade mode

There are two ways to enter the firmware upgrade mode

From LCD panel, select upgrade firmware option Or

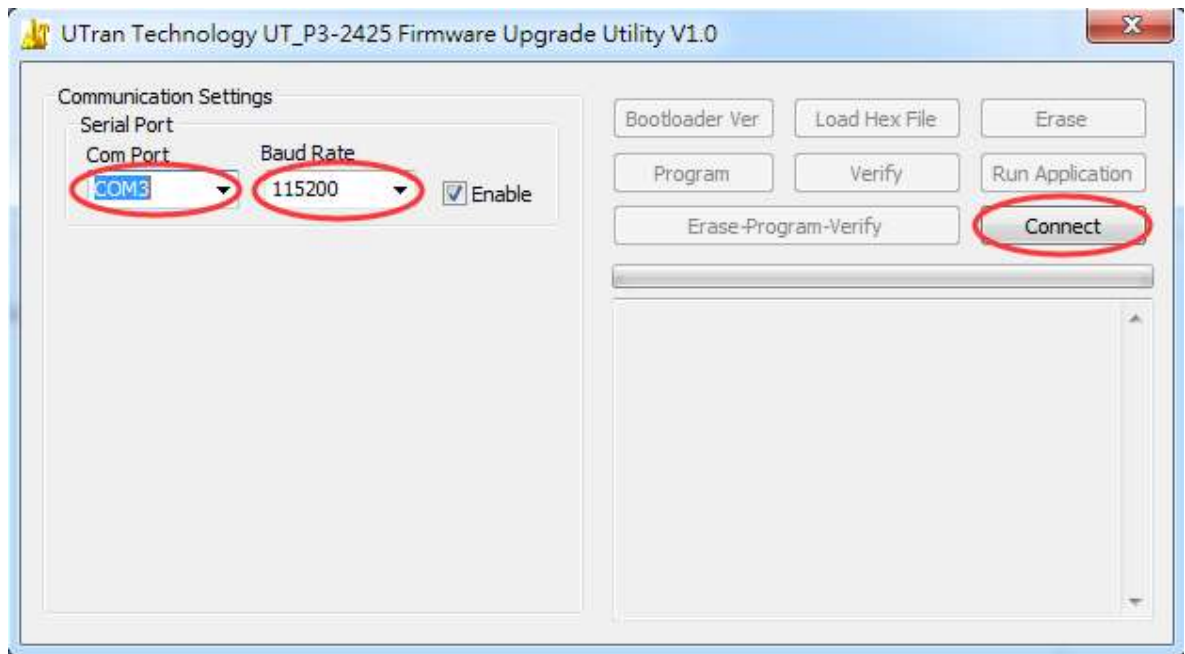
Before power on system, press and hold mute button ( **6** -> near LAN port ) then power on system

If enter firmware upgrade mode success, user can check "System healthy LED **11**" is blinking (Green/Red)

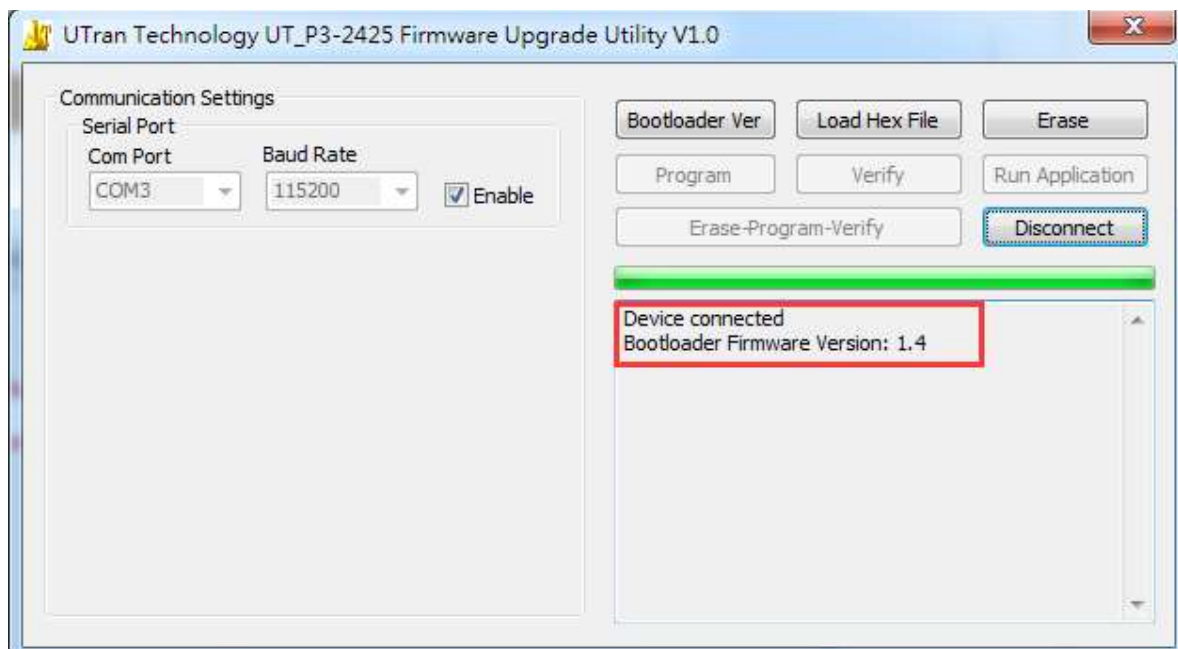


## Launch the firmware upgrade application and setting

After launch application, select the "Com Port" used to upgrade firmware and the baud rate is 115200 then click connect

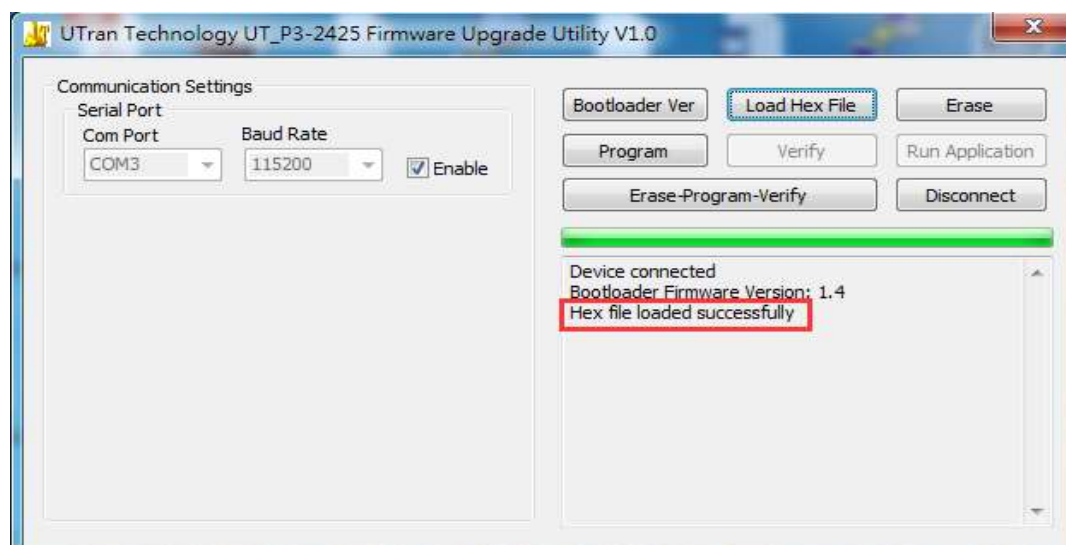
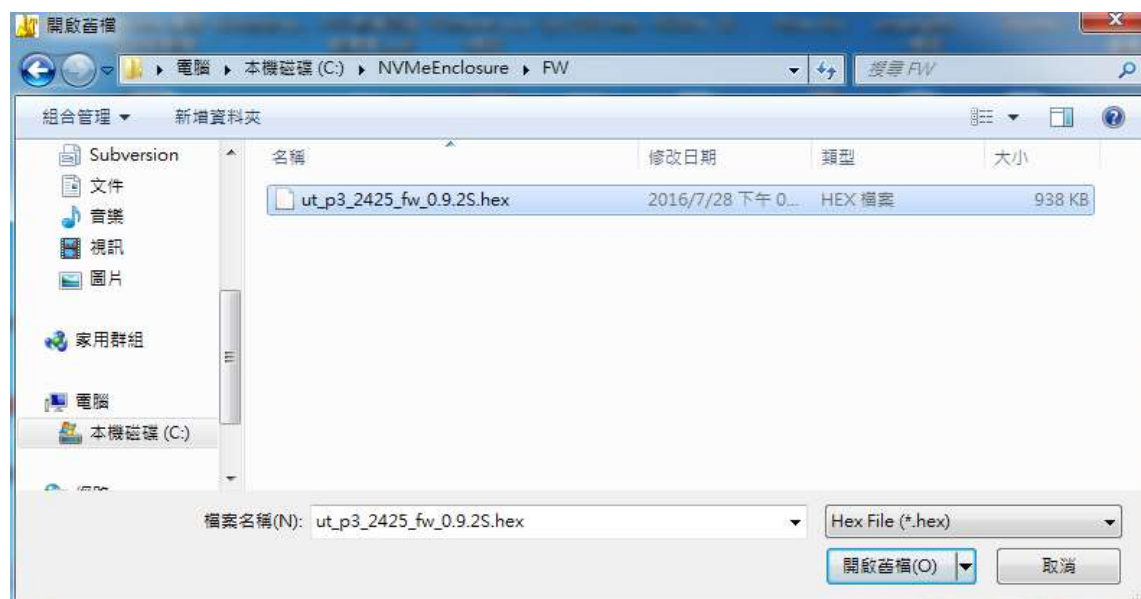
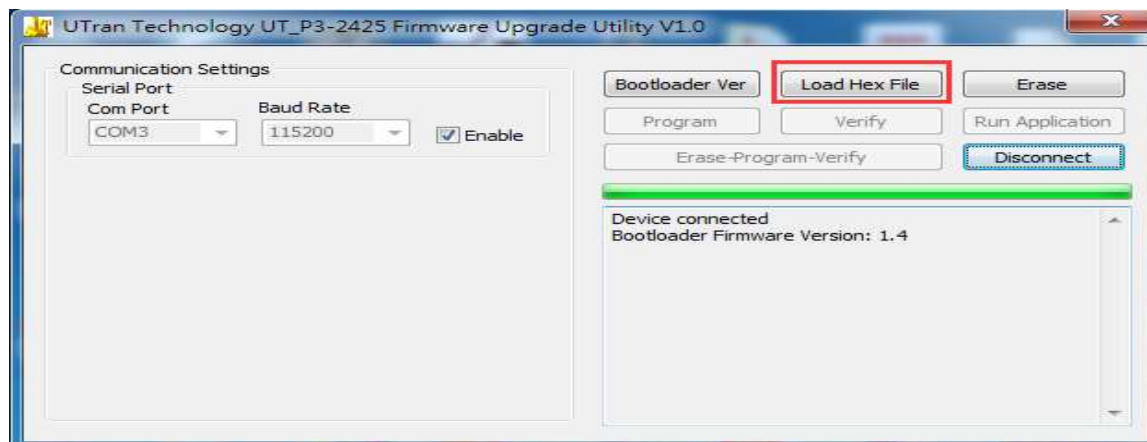


Check the message to make sure device is connected.



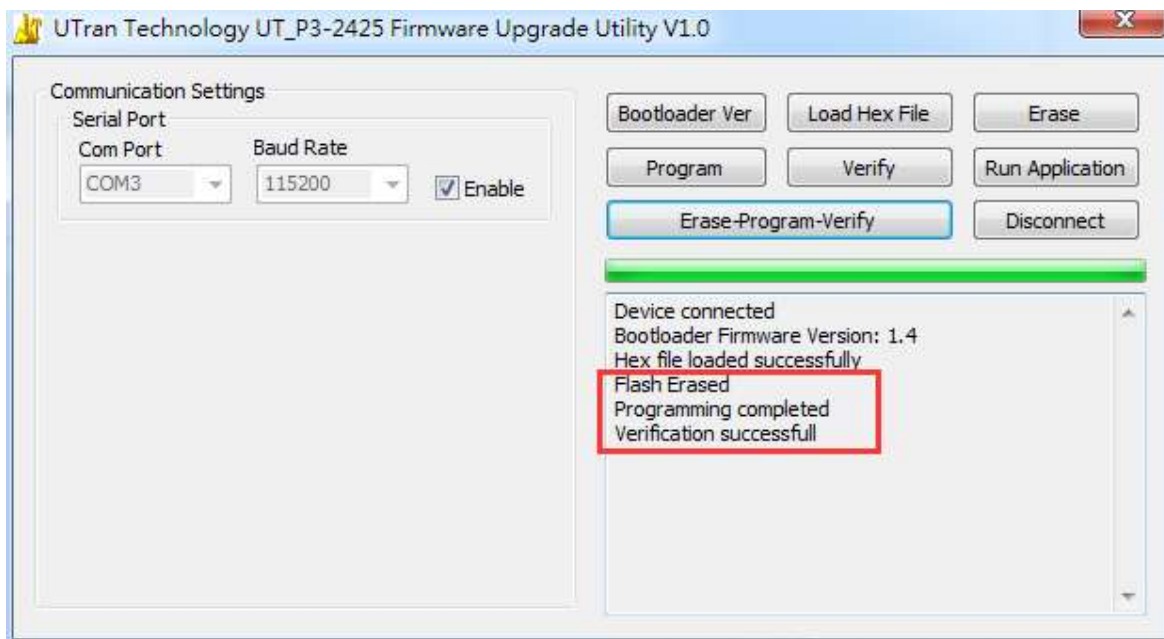
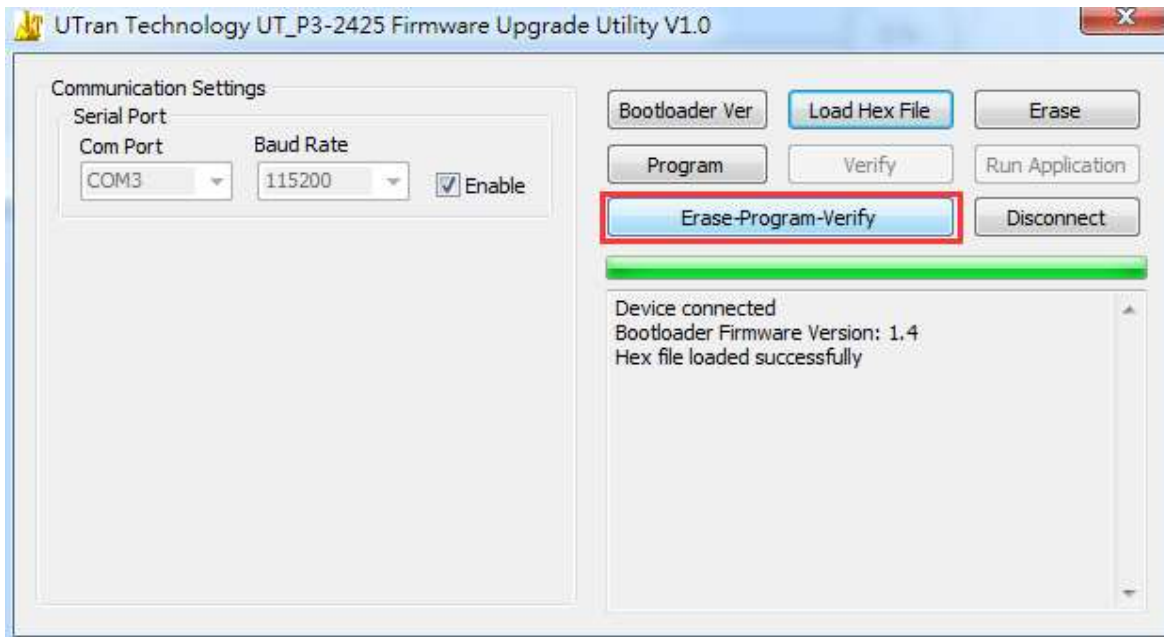
## Load firmware file

Click "Load Hex File" button to select firmware file

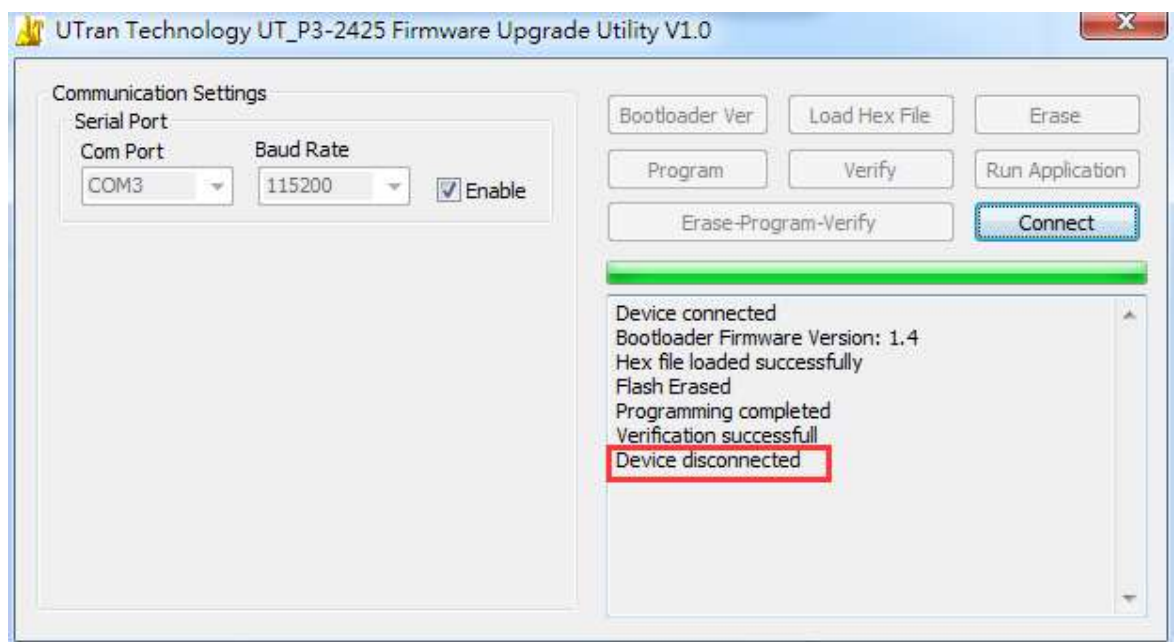
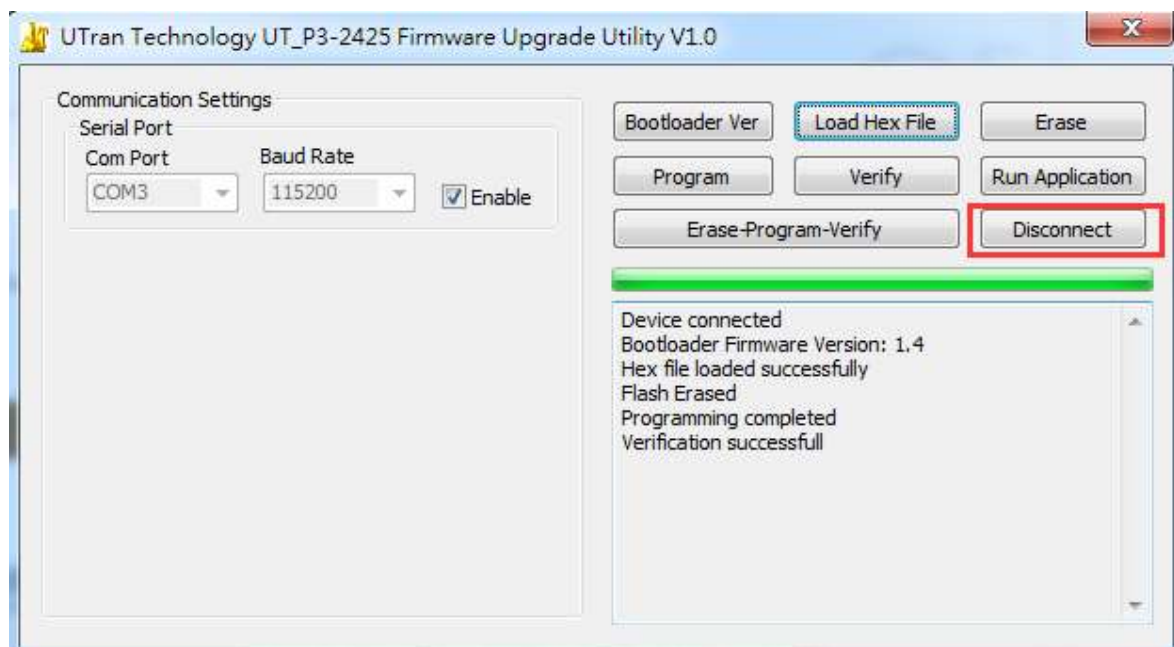


## Begin to upgrade firmware process

After load firmware file, click "Erase-Program-Verify" button to start upgrade process.



## Disconnect serial port and power cycle the system



## History

Publication History		
Revision	Date	Description of Changes
1.0	2017/01/09	Original (Based on FW version 0.9.2S)
1.1	2017/08/31	Based on FW version 1.0.8A Refine CLI command portion. Minor changes, corrections.
1.2	2018/3/15	Add pictures and descriptions for accessories in package