

NS388S

2U 24-bay(2.5") SAS (Host) to SAS/SATA (Disk) JBOD with
12Gb/s SAS Expander



User Manual

Third edition, Feb. 2020

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 Netstor 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 Netstor Customer Service for additional advice not covered in this User's Guide.

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1. Introduction

1.1 Overview

Netstor's enterprise-class 12Gbps SAS Expander JBOD enclosure is designed to provide storage expansion for 12G/6Gbps SAS RAID adapter and HBA. The enclosure is equipped with 12Gbps SAS Expander supporting twenty-four (24) high-reliable SAS 12G/6G/3Gbps, high-capacity SATA 6/3Gbps HDDs, or SSDs. With only single HD mini-SAS cable host connectivity, the extra two HD mini-SAS ports allow users to expand multiple 12Gbps SAS JBOD enclosures, ensuring it the most cost-effective storage expansion.

1.2 Package Checklist

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

- A. Enclosure × 1
- B. 2.5" drive tray (installed in the NS388S) × 24
- C. Hard disk drive mounting screw × 96
- D. Key for drive tray × 2
- E. HD mini-SAS (SFF-8644) to HD mini-SAS (SFF-8644) data cable (optional) × 1

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 NS388S enclosure.

2.1 Panel Layout

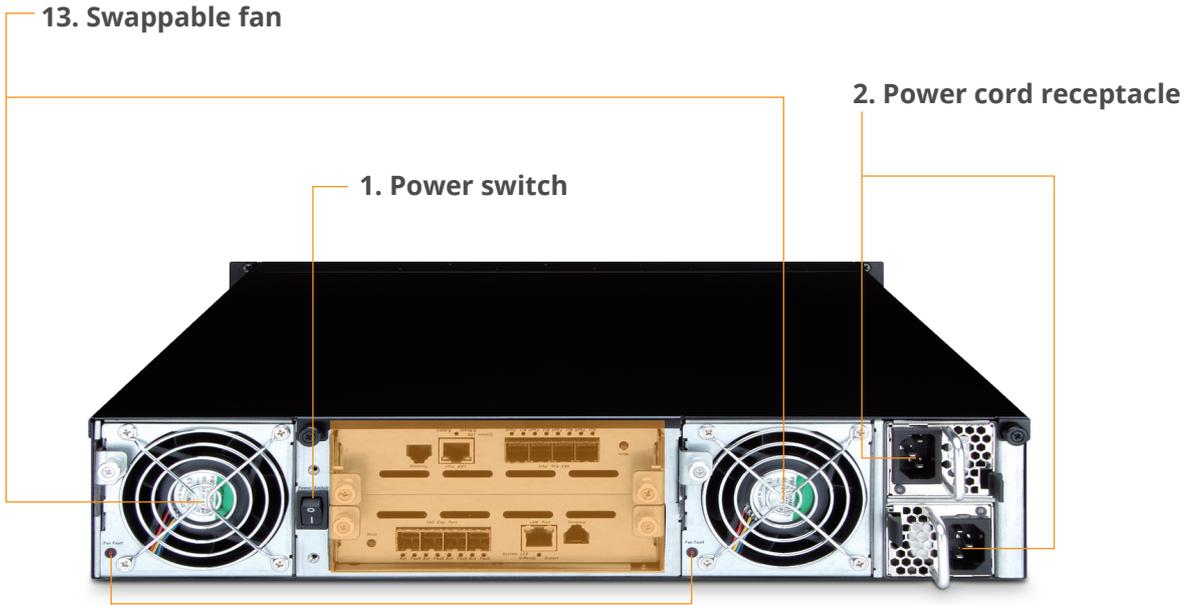


1. Drive presence LED

- White – Power on

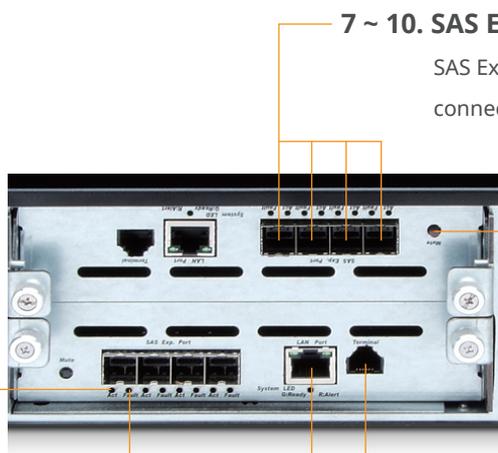
2. Activity indicator LED

- Blue – HDD ready
- Flash Blue – Access
- Flash Pink – Rebuilding
- Red – HDD failure



3. Fan status LED

- Normal – No light
- Failure – Red



7 ~ 10. SAS Exp. connector

SAS Exp. connector port is with auto detection for host connection and for downstream daisy-chained storage

4. Mute button

- To mute buzzer beeping of fan/PSU failure

5. Access LED

- Green – Accessing is ready

6. Fault LED

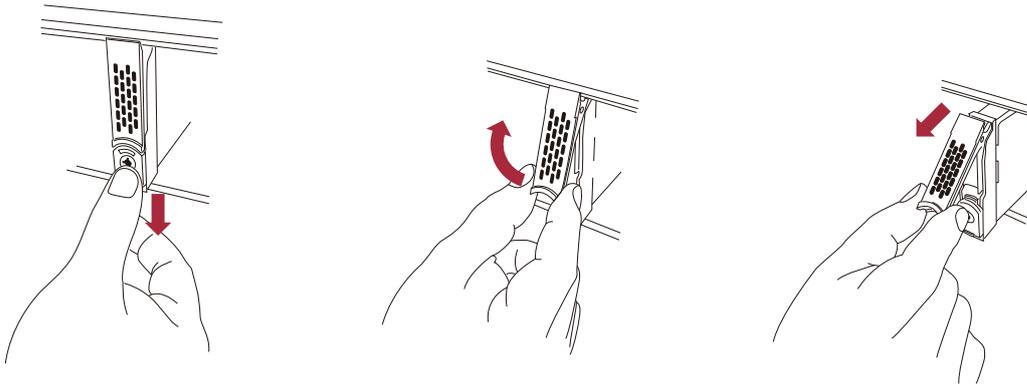
- Red – Linking is failed

12. Terminal port for CLI configuration

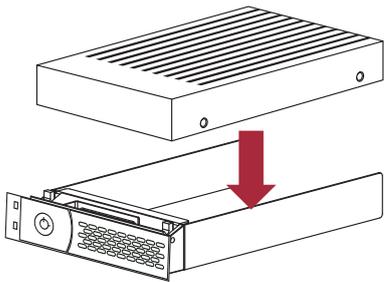
11. LAN port

2.2 Enclosure Setup

1. Remove the NS388S 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.

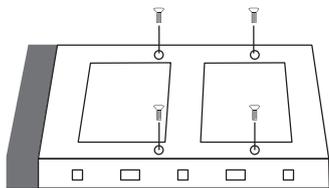


※ You must verify the heads of the four screws are level with the drive tray while the drive is attached to the tray; otherwise, a screw may take hold of the tray from the bottom side and prevent you to pull the tray out of the enclosure.

4. Adopt four of the screws provided, and fasten the drive on the tray.

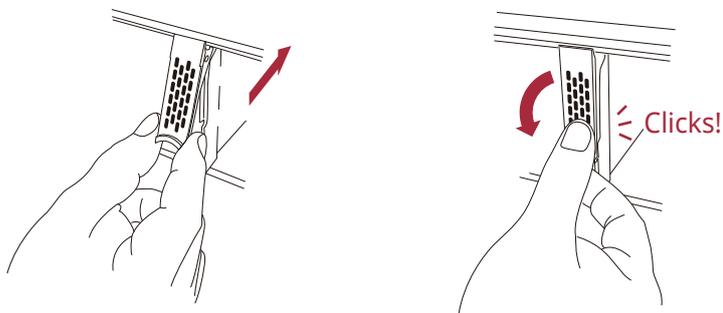
Tighten each screw to fasten the drive snugly to the drive tray.

Do not tighten the screws overly.



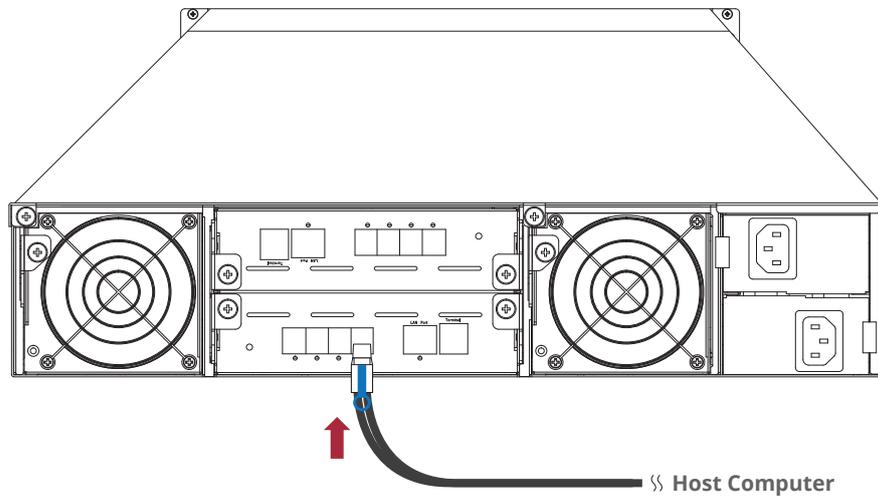
※ Do not force the levers to close while you insert drive modules into the NS388S enclosure. If a lever does not close smoothly, draw out and insert the drive module again, and then press the lever to close.

5. Insert the drive module into the NS388S 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 NS388S enclosure to the host interface of a RAID card through the SFF-8644 HD mini-SAS data cable. Connection between NS388S enclosure and RAID card port is shown as follows:



NS388S's SAS Exp. connectors support auto detection; among enclosure's four SFF-8644 ports, the right two SFF-8644 ports are for host connection; the left two SFF-8644 ports are for downstream daisy-chained storage.

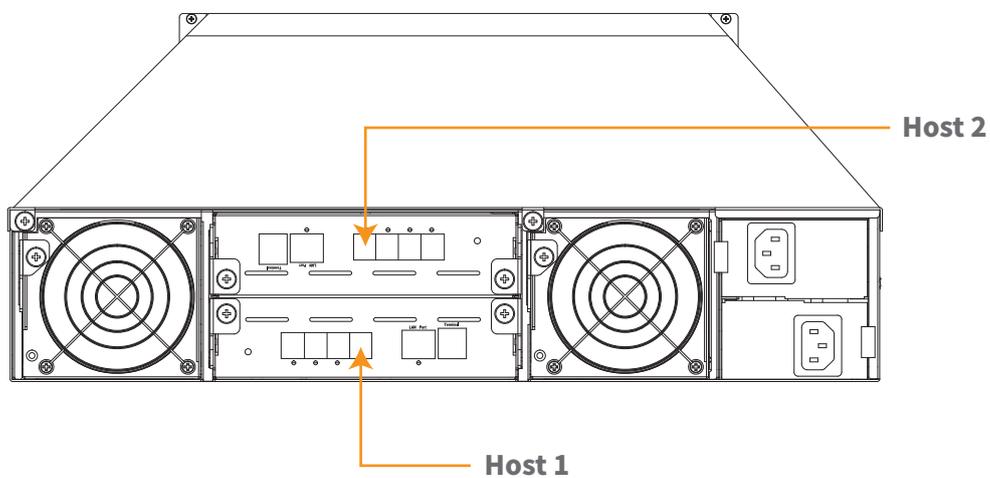
8. Connecting NS388S enclosure's RS-232 Port (optional)

- NS388S enclosure's system functions can be managed via a computer running a VT-100 terminal emulation program, or a VT-100 compatible terminal. The provided internal cable converts the RS-232C signals from the RJ11 into the one 9-pin D-Sub male connector.

9. The NS388S storage enclosure with dual 12G SAS Expanders (model: NS388S-DE) supports redundant application that allows two host computers to connect to each 12Gbps SAS Expander module within the Netstor unit at the same time. Therefore, when one 12G SAS Expander module accidentally fails, the other host computer will still be able to access the data files stored on the Netstor storage in support of the failover.

	Host Redundant	HDD	Zone Mode
NS388S-SE (single 12G SAS expander)	✘	SATA drive & SAS 6G/12Gbps drive	✔
NS388S-DE (dual 12G SAS expanders)	✔	SAS 6G/12Gbps drive	✔

The connection diagram for NS388S-DE storage redundant usage is shown as follows:



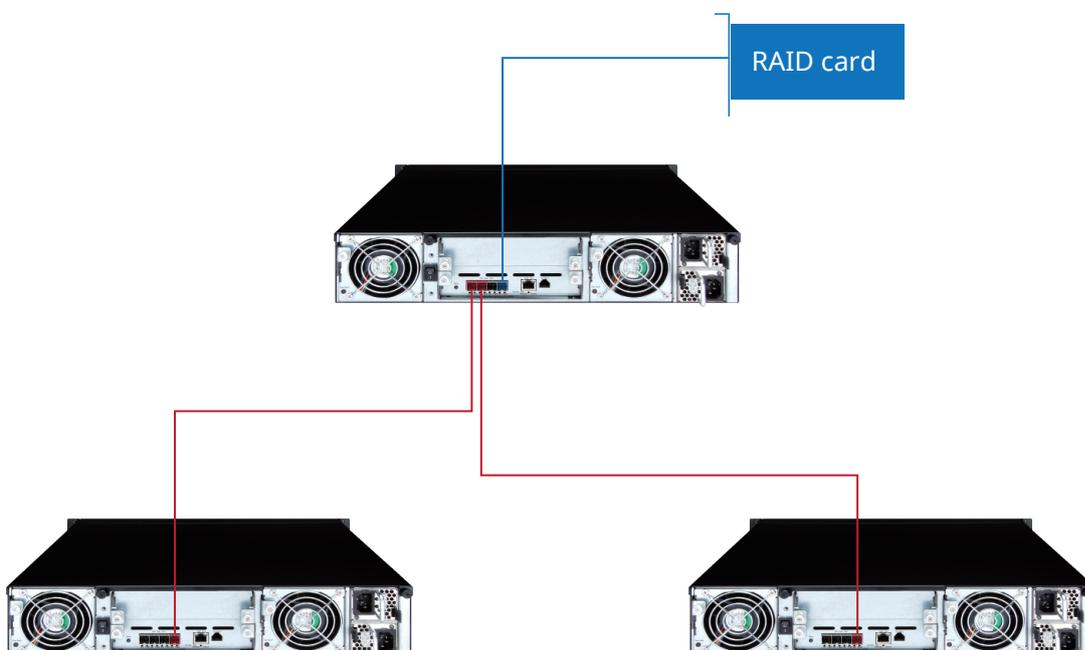
10. Add more NS388S enclosures (optional)

NS388S enclosure can be run in one of the two modes:

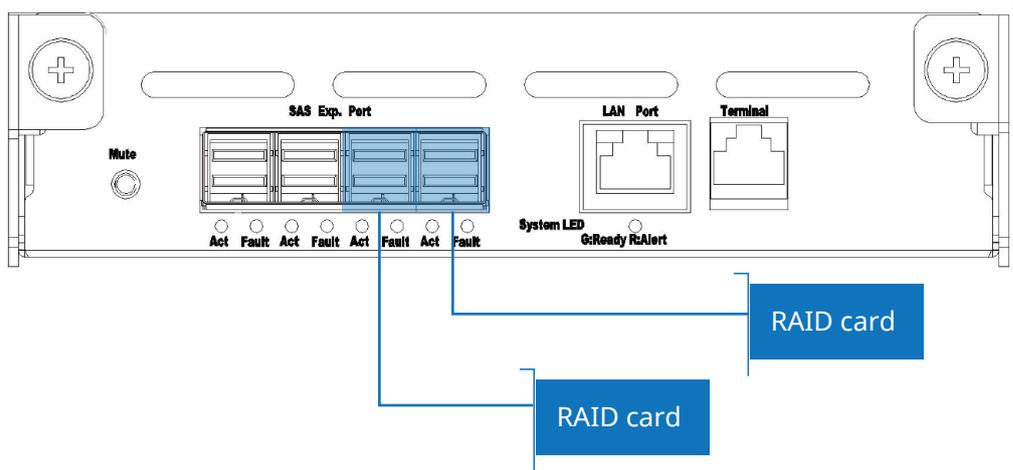
- Normal Mode
- Zone Mode

You must select either mode using the CLI utility and re-start the NS388S enclosure. The default is Normal Mode. Change the mode while NS388S enclosure is on. This will not affect expander operation until NS388S enclosure is rebooted.

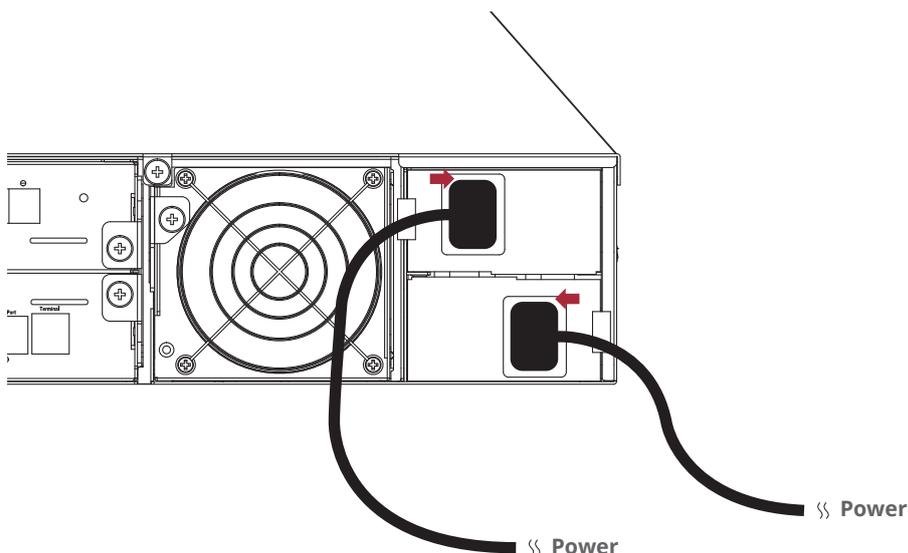
In normal mode, a SAS host can communicate with all drives in NS388S enclosure. The NS388S enclosure contains expander ports. Expander ports can be attached to SAS initiator ports, SAS and/or SATA target ports, and other expander ports. The SAS RAID controller card supports daisy-chain. The number of the NS388S enclosures that can be supported depends on the RAID controller card firmware. The following figure shows the connections of NS388S enclosures with external HD mini-SAS data cables and SAS RAID card.



In zone mode, NS388S enclosure can be split into up to 8 virtual groups. Each group's drive channels and external cable connectors are assigned by CLI GROUP command. The following figure shows NS388S enclosure that is split into 2 virtual groups. Each group's drive channels are controlled by individual host adapter using SAS CH1 and SAS CH2. Refer to chapter 3.3 CLI feature of GR command that is used to associate the external port and the devices/phys slot.



11. The NS388S enclosure provides redundant power supply unit, so connect one end of the two power cords to the two receptacles on rear of NS388S enclosure, and then connect the other end of the two power cords to the power outlets.



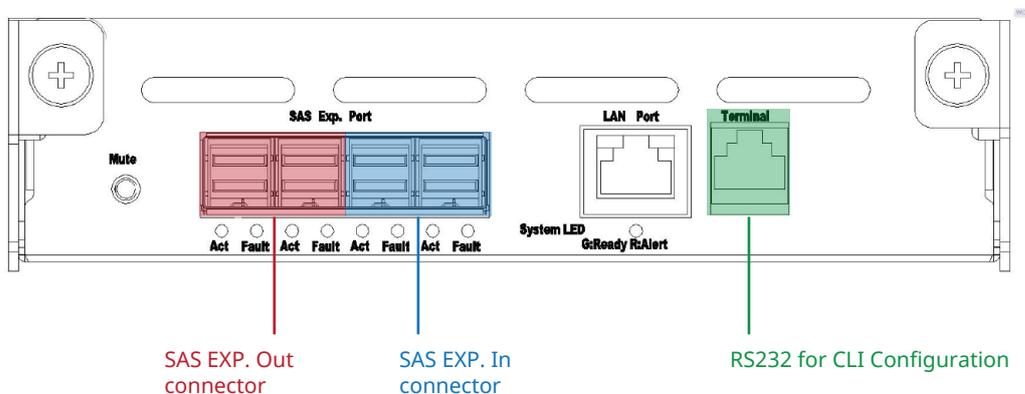
12. After the two power cords are connected, you can power on NS388S and the computer. The power-on sequence is to firstly power on NS388S and then computer to make sure RAID card recognizes the drives in NS388S.

3. CLI Manager

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

- **Locations of RS-232C Port**

NS388S SAS JBOD enclosure uses the RJ11 port as the serial port interface. Please use the cable included on the shipping box to configure the expander controller.



- **Establishing the Connection for the RS-232 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 1K XMODEM file transfer protocol.

The serial port on NS388S SAS JBOD enclosure's bracket can be used in VT100 mode. The provided interface cable converts the RS232 signal of the RJ11 connector on the SAS expander controller into a 9-pin D-Sub male connector. The firmware-based terminal SAS expander management interface can access the expander through this RS-232 port. You can attach a VT-100 compatible terminal or a PC running a VT-100 terminal emulation program to the serial port for accessing the text-based setup menu.

3.1 Expander RS-232C Port Pin Assignment

To ensure proper communications between NS388S SAS JBOD enclosure and the VT-100 Terminal Emulation, please configure the VT100 terminal emulation settings to the values shown below:

Terminal requirement	
Connection	Null-modem cable
Baud Rate	115,200
Data bits	8
Stop	1
Flow Control	None

The controller RJ11 connector pin assignments are defined as below.

Action			
Pin	Description	Pin	Description
1	NC	3	TXD
2	RXD	4	GND

3.2 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.

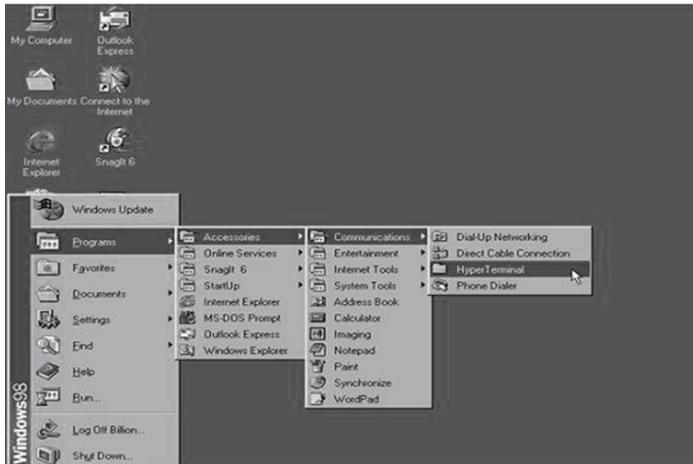
There are a wide variety of Terminal Emulation packages, but for the most part they should be very similar. The following setup procedure is an example of setting up VT100 Terminal in Windows O.S. using Hyper Terminal version 3.0 or higher. For Windows 7, 8.1 or 10, the HyperTerminal needs to be downloaded; here is the reference site:

<http://en.softonic.com/s/hyperterminal-windows-7>

Step 1.

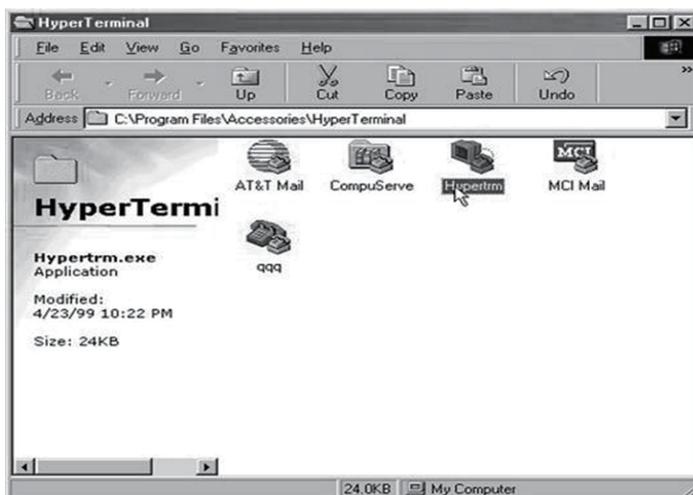
Open the "Taskbar Start" / "Programs" / "Accessories" / "Communications" / "Hyper Terminal".

(Hyper Terminal requires version 3.0 or higher).



Step 2.

Open "HYPERTRM.EXE".



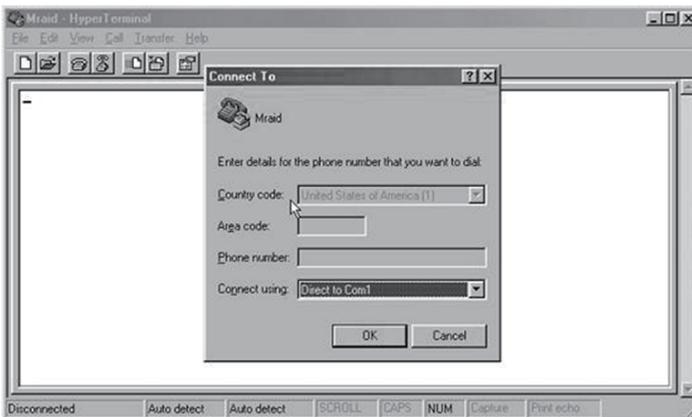
Step 3.

Enter a name you prefer and then click "OK".



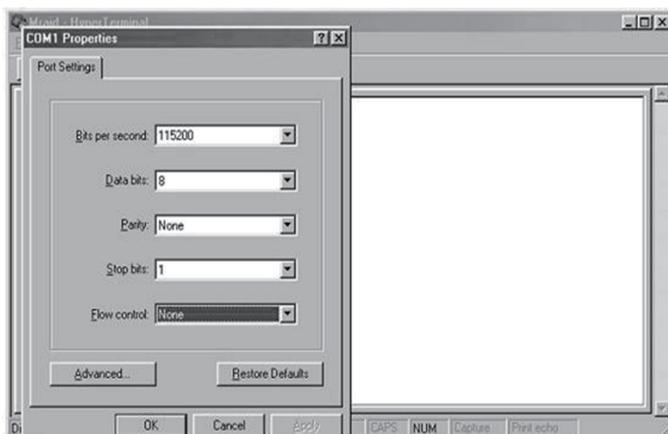
Step 4.

Select an appropriate connecting port and then click "OK".



Step 5.

Configure the port parameter settings and then click "OK".



Bits per second: 115200

Data bits: 8

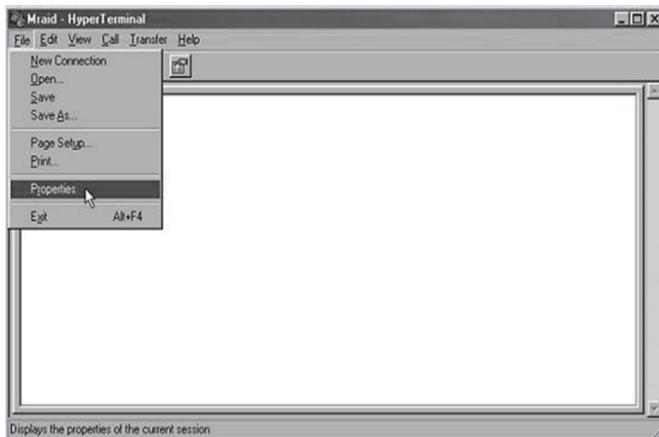
Parity: None

Stop bits: 1

Flow control: None

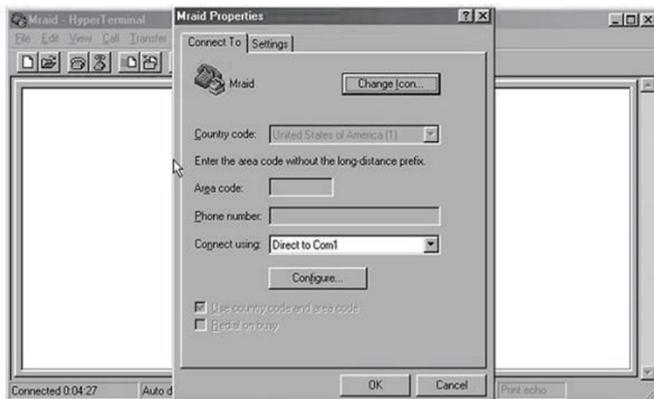
Step 6.

Open the file menu and select "Properties"



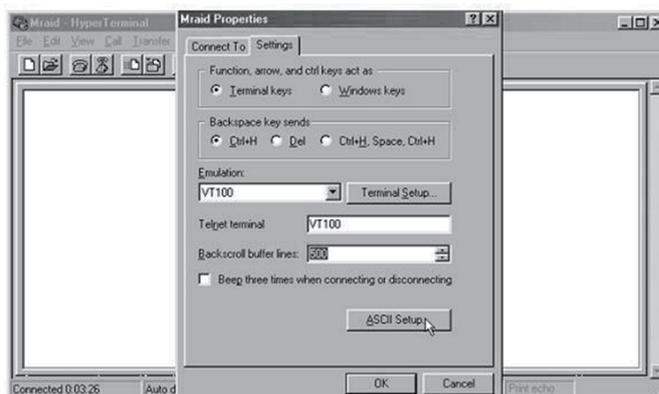
Step 7.

Configure the "Connect To" setting.



Step 8.

Configure the "Settings" items and then click "OK".



Function, arrow and ctrl keys act as: Terminal Keys

Backspace key sends: Ctrl+H Emulation: VT100

Telnet terminal: VT100

Back scroll buffer lines: 500

3.3 CLI Command

This section provides detailed information about NS388S enclosure's CLI function.

All the commands please type in lower case.

The following table gives a summary of all commands to CLI function.

Function	Command	Syntax
Set password for SAS Expander enclosure	pass	pass [enter]
Exit CLI of SAS Expander enclosure	lo	lo [enter]
Set zone group	gr	gr {dev GroupNo[1..] {ci, cj, ck,..} Start-Index(D) End-Index(D)}
Show system information about enclosure	sys	sys [enter]
Staggering HDD spin-up	spin	spin [delay value] [drive number]
Operate the buzzer attribute	bu	bu [en dis]
Report power state of each drive slot	hspc	hspc [enter]
Show status of each component on enclosure	lsd	lsd [hdd temp volt curr pwr con fan alarm]
Show event log of SAS Expander enclosure	showlogs	showlogs [enter]
Clear event log of SAS Expander enclosure	clearlogs	clearlogs [enter]
Update the firmware of SAS Expander enclosure	fdl	fdl [code mfgb] offset
Show Ethernet port configuration	eth	eth [enter]
Close TCP/IP session	exit	exit [enter]
Reset SAS Expander enclosure	reset	reset [enter]
Show list of commands	help	help [enter]

1. HELP Command

This command provides an on-line table of contents, providing brief descriptions of the help sub-commands. You can use the <CLI> help to get detail information about the CLI commands summary.

Syntax: CLI>help[Enter]

```
CLI>
CLI>help
=====
    pass      - Set Password

    lo        - Logout CLI Shell

    Gr        - Set the PHY Group
              - Usage: gr {dev GroupNo[1..] {ci, cj, ck,..} Start-Index (D) End-Index(D)}

    sys       - System Information

    spin      - Drive SpinUp Control
              - Usage: spin [ Delay(D)[ms] Num(D) ]

    bu        - Operate the Buzzer Attribute
              - Usage: bu [enldis]

    hspc      - HDD Slot Power Control and Show HDD Slot Power Status
              - Usage: hspc {slot [on|off]}

    Isd       - List Devices Status
              - Usage: Isd [ hdd | temp | volt | curr | pwr | con | fan | alarm ]

    showlogs  - Show the current logs
              - Usage: showlogs [DisplayMode(hex, detail, default)]

    Clearlogs - Clear the logs

    fdl       - File DownLoad
              - Usage: fdl { code | mfgb } offset

    eth       - Set Ethernet IP Configuration
              - Usage: eth <ipaddr(*)> <subnet(*)> <gateway(*)>

    exit      - Close TCP/IP session

    reset     - Resets the expander

    help      - CLI Help
=====
CLI>
```

[↪ CLI Command List](#)

2. PASS Command

The pass command allows user to set or clear 12Gbps SAS JBOD enclosure password protection feature. Once the password has been set, the user can only monitor and access 12Gbps SAS JBOD enclosure setting by providing the correct password. The password can accept max. 8 chars and min. 4 chars. The manufacture default password is "00000000".

Syntax: CLI>pass [Enter]

```
CLI>pass
Old Password: *****
New Password: *****
Verify New Passuord : *****
Password Changed And Save Permanently!

CLI>
```

3. LO Command

To exit the selected 12Gbps SAS JBOD enclosure CLI shell, use the lo command.

Syntax: CLI>lo [Enter]

```
CLI>
CLI>lo
Logout Successful!
```

[↩ CLI Command List](#)

4. GROUP Command

The group command is used to associate the external port with the devices/phys as one zone group. The three external cable ports and all devices/phys slots will default associate with one zone group.

Syntax:

```
gr {dev GroupNo[1..] {ci, cj, ck,..} Start-Index(D) End-Index(D)}
```

dev : use drive slot index

GroupNo : groupno start from 1 to 8, max 8 groups

ci, cj, ck,..: external wide port connector. i, j, k,.. is the index which range from 0 to 3. According to view from HDD connector side, the HDD slot index 1 to 24 start from left to right and top to bottom. According to view from wide port connector side, the external wide port connector c0, c1, c2, or c3 is start from left to right of each expander board.
(Note: the connector near lan port is c0.)

Start-Index : Start slot index of zone range, [1.. Max Slot Index]

End-Index : End slot index of zone range, [1.. Max Slot Index]

on : enable zoning feature

off : disable zoning feature

clr : clear the zone group setting

→ Show current group setting

Syntax: CLI>gr [Enter]

```
CLI>
CLI>gr
Current Setting
Default zone configuration
Group-1: C0 C1 C2 C3, slot: 1 2 3 4 ~ 24

CLI>
```

→ Set the connector 0 and slot 1 to slot 4 as group 1

Syntax: CLI>gr dev 1 c0 1 4[Enter]

```
CLI>
CLI>gr dev 1 c0 1 4
New Setting
Group-1: C0 Slot: 1 2 3 4
Save new group setting ok

CLI>
```

→ Set the connector 1 and connector 2 and slot 5 to slot 16 as group 2

Syntax: CLI>gr dev 2 c1,c2 5 16 [Enter]

```
CLI>
CLT>gr dev 2 c1,c2 5 16
New Setting
Group-1: C0 Slot: 1 2 3 4
Group-2: C1 C2 Slot: 5 6 7 8 9 10 11 12 13 14 15 16
Save new group setting ok

CLI>
```

Note: Reset needed for new setting to take effect

After Power Cycle, check current setting

Syntax: CLI>gr [Enter]

```
CLI>
CLI>gr
Current Setting
Group-1: C0 Slot: 1 2 3 4
Group-2: C1 C2 Slot: 5 6 7 8 9 10 11 12 13 14 15 16

CLI>
```

→ Clear the Zone group setting

Syntax: CLI>gr clr [Enter]

```
CLI>
CLI>gr clr
New Setting
Default zone configuration
Group-1: C0 C1 C2 C3, Slot: 1 2 3 4 ~ 24
Clear group configuration ok

CLI>
```

Note: After power cycle, new setting will be default zone configuration

↪ CLI Command List

→ Enable zoning

Syntax: CLI>gr on [Enter]

```
CLI>  
CLI>gr on  
Enable zoning - save zone configuration ok  
  
CLI>
```

→ Disable zoning

Syntax: CLI>gr off [Enter]

```
CLI>  
CLI>gr off  
Disable zoning - save zone configuration ok  
  
CLI>
```

[↪ CLI Command List](#)

5. SYS Command

The sys command is used to view the information of 12Gbps SAS JBOD enclosure. Typical information includes: vendor ID, product ID, serial/unit number, SAS address, product revision, chip ID/chip revision, enclosure ID, chassis type, firmware revision and firmware build date.

Syntax: CLI>sys [Enter]

```
=====
Hardware Revision Information: -
=====
Vendor ID           :Netstor
Product ID          :NS388S_2
Expander Serial No  :151230S324250008
Backplane Serial No :151211S324250001
Expander SAS Address :0x538262B10006303F
Product Revision    :30
Expander Chip ID    :0x0232 (Ports :40)
Expander Chip Revision :C1
Enclosure ID        :538262B10000603F
Chassis Type        :2U
=====
Firmware Revision Information:-
=====
Firmware Revision   :0010
Build Date          :jan 23 2020 06:37:50
CLI>
```

[↪ CLI Command List](#)

6. SPIN Command

The spin command defines the mode of staggering SATA drive spin-up function connected to 12Gbps SAS JBOD enclosure. This command gives 12Gbps SAS JBOD enclosure the ability to spin up the disk drives sequentially or in groups, allowing the drives to come ready at the optimum time without straining the system power supply. Staggering drive spin-up in a multiple drive environment also avoids the extra cost of a power supply designed to meet short-term startup power demand as well as:

Syntax: CLI> spin [Delay(D)[ms] Num(D)]

Expander issues the spin up the drives by [Num] drives with [Delay] ms.

→ Check current setting

```
CLI>
CLI>spin
Current SpinUp Attribute:
Drive Number: 2
Delay: 1024 ms

CLI>
```

→ Set spin up drive number to 3 with 2048 ms delay

Syntax: CLI>spin 2048 3

```
CLI>
CLI>spin 2048 3
New SpinUp Attribute:
Drive Number : 3
Delay: 2048 ms

Current SpinUp Attribute:
Drive Number: 2
Delay: 1024 ms

CLI>
```

Note: Reset needed for new setting to take effect

[↪ CLI Command List](#)

7. BU Command

The bu command is for enable / disable audible alarm function of the 12Gbps SAS JBOD enclosure.

Syntax: CLI> bu [en | dis]

→ Check buzzer status

Syntax: CLI>bu

```
CLI>
CLI>bu
Current Buzzer Function: Enable
Current Buzzer Status: Off

CLI>
```

Note:

Current Buzzer Function : Enable (audible alarm function is enable)
Disable (audible alarm function is disable)

Current Buzzer Status : On (Buzzer is beeping now)
Off (Buzzer is not beeping now)

→ Disable audible alarm function

Syntax: CLI>bu dis

After disable audible alarm function, check status again

Syntax: CLI>bu

```
CLI>
CLI>bu dis

CLI>bu
Current Buzzer Function: Disable
Current Buzzer Status: Off

CLI>
```

[↪ CLI Command List](#)

8. LSD Command

The lsd command is use to show the element devices status in the expander controller. With parameter, this command only shows the select device status.

Syntax:

```
CLI> lsd [ hdd | temp | volt | curr | pwr | con | fan | alarm ]
```

Show SES elements information:

→ Show SES Array Device Element information

Syntax: CLI>lsd hdd

```
CLI>
CLI>lsd hdd
ArrayDevice Elenent (0x17):
=====
NAME          ID    PHY    NLR    MAX    MIN    TYPE          ADDRESS
=====
HDD slot 01   00    25    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 02   01    24    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 03   02    32    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 04   03    36    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 05   04    18    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 06   05    12    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 07   06    34    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 08   07    37    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 09   08    19    12.0G  12.0G  3.0G  SAS          50000396-38221C0E
HDD slot 10   09    13    12.0G  12.0G  3.0G  SAS          50000396-38221BEA
HDD slot 11   10    35    12.0G  12.0G  3.0G  SAS          50000396-38221C8E
HDD slot 12   11    38    12.0G  12.0G  3.0G  SAS          50000396-38221C1A
HDD slot 13   12    14    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 14   13    16    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 15   14    26    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 16   15    39    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 17   16    15    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 18   17    27    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 19   18    23    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 20   19    33    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 21   20    20    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 22   21    21    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 23   22    22    0.0G  12.0G  3.0G  Unknown      00000000-00000000
HDD slot 24   23    27    0.0G  12.0G  3.0G  Unknown      00000000-00000000
```

Note: User can check link speed and SAS address of each drive

↪ CLI Command List

→ Show Temperature Element information

Syntax: CLI>lsd temp

```
CLI>lsd temp
Temperature Element (0x04):
=====
NAME           ID    CT(C)  HTW  LTW  STATUS
=====
Exp Internal Temp  00    62    105   10   OK
Exp Ambient Temp  01    40    65    10   OK
Bp Slot 01 Temp  02    22    60    10   OK
Bp Slot 02 Temp  03    22    60    10   OK
Bp Slot 03 Temp  04    22    60    10   OK
Bp Slot 04 Temp  05    23    60    10   OK
Bp Slot 05 Temp  06    22    60    10   OK
Bp Slot 06 Temp  07    23    60    10   OK
Bp Slot 07 Temp  08    22    60    10   OK
Bp Slot 08 Temp  09    24    60    10   OK
Bp Slot 09 Temp  10    24    60    10   OK
Bp Slot 10 Temp  11    25    60    10   OK
Bp Slot 11 Temp  12    24    60    10   OK
Bp Slot 12 Temp  13    24    60    10   OK
Bp Slot 13 Temp  14    24    60    10   OK
Bp Slot 14 Temp  15    25    60    10   OK
Bp Slot 15 Temp  16    25    60    10   OK
Bp Slot 16 Temp  17    24    60    10   OK
Bp Slot 17 Temp  18    22    60    10   OK
Bp Slot 18 Temp  19    22    60    10   OK
Bp Slot 19 Temp  20    24    60    10   OK
Bp Slot 20 Temp  21    25    60    10   OK
Bp Slot 21 Temp  22    25    60    10   OK
Bp Slot 22 Temp  23    25    60    10   OK
Bp Slot 23 Temp  24    24    60    10   OK
Bp Slot 24 Temp  25    24    60    10   OK
Psu 1 Temp       26    30    60    10   OK
Psu 2 Temp       27    36    60    10   OK
```

Note: User can check temperature of expander chip, 24 slots and PSUs

CT : Current Temperature

HTW : High Threshold Warning

LTW : Low Threshold Warning

STATUS : Temperature element status

[↪ CLI Command List](#)

→ Show Voltage Element information

Syntax: CLI>Isd volt

```
CLI>
CLI>Isd volt
Voltage Element (0x12):
=====
NAME                ID      VOLT(V)  OVLMT    UVLMT    STATUS
=====
Exp Voltage 3.3V    00      3.29     3.46     3.14     OK
Exp Voltage 0.9V    01      0.92     0.95     0.85     OK
Exp Voltage 0.9V Reg 02      0.92     0.95     0.85     OK
Exp Voltage 1.8V    03      1.84     1.89     1.71     OK
Exp Voltage 5.0V    04      5.16     5.25     4.75     OK
Exp Voltage 12.0V   05     12.22    12.60    11.40    OK
BackPlane Voltage 5.0V 06      5.10     5.25     4.75     OK
PSU 1 Vout          07     12.22    12.60    11.40    OK
PSU 2 Vout          08     12.22    12.60    11.40    OK
```

Note: User can check voltage of expander chip, backplane and PSUs

VOLT(V) : Current Voltage

OVLMT : Over Voltage Max. Threshold

UVLMT : Under Voltage Min. Threshold

STATUS : Voltage element status

→ Show Current Element information

Syntax: CLI>Isd curr

```
CLI>
CLI>Isd curr
Current Element (0x13):
=====
NAME                ID      CURR(A)  OCUMT    STATUS
=====
PSU 1 Iout          00      1.00     72.00    OK
PSU 2 Iout          01      1.50     72.00    OK

CLI>
```

Note: User can check current of PSUs

CURR(A) : Current

OCUMT : Over Current Max. Threshold

STATUS : Current element status

↪ CLI Command List

→ Show Power Supply Element information

Syntax: CLI>Isd pwr

```
CLI>
CLI>Isd pwr
PowerSupply Element (0x02):
=====
NAME                ID          STATUS
=====
PSU 1                00          OK
PSU 2                01          OK

CLI>
```

STATUS : Power Supply element status

→ Show Connector Element information

Syntax: CLI>Isd con

```
CLI>
CLI>Isd con
Connector Element (0x19):
=====
NAME                ID          PHY          NLR          TYPE          STATUS
=====
Connector00         00          28           12.0G        5             Connected
Connector00         00          29           12.0G        5             Connected
Connector00         00          30           12.0G        5             Connected
Connector00         00          31           12.0G        5             Connected
Connector01         01          0            0.0G         5             No Link
Connector01         01          1            0.0G         5             No Link
Connector01         01          2            0.0G         5             No Link
Connector01         01          3            0.0G         5             No Link
Connector02         02          4            0.0G         5             No Link
Connector02         02          5            0.0G         5             No Link
Connector02         02          6            0.0G         5             No Link
Connector02         02          7            0.0G         5             No Link
Connector03         03          8            0.0G         5             No Link
Connector03         03          9            0.0G         5             No Link
Connector03         03          10           0.0G         5             No Link
Connector03         03          11           0.0G         5             No Link
```

Note: User can check each external mini-SAS HD port link status

NAME : ConnectorXX (External port 00 ~ 03, each one is 4 lanes)

NLR : Link speed

STATUS : Link status

↪ CLI Command List

→ Show Cooling Element information

Syntax: CLI>lsd fan

```
CLI>
CLI>lsd fan
Cooling Element (0x03):
=====
NAME                ID      SPEED CODE  RPM      STATUS
=====
Enclosure Fan 1     00      0           2960     OK
Enclosure Fan 2     01      0           1480     OK
PSU 1 Fan 1        02      2           4000     OK
PSU 1 Fan 2        03      2           4000     OK
PSU 2 Fan 1        04      1           2000     OK
PSU 2 Fan 2        05      1           2100     OK
```

Note: User can check each fan speed in enclosure

RPM : Fan speed (unit : rpm)

STATUS : Cooling element status

→ Show Audible Alarm Element information

Syntax: CLI>lsd alarm

```
CLI>
CLI>lsd alarm
AudibleAlarm Element (0x06):
=====
NAME                ID      STATUS      ALMSTATE
=====
Alarm Buzzer        00      Muted       Normal
CLI>
```

Note: User can check alarm buzzer status

STATUS : Audible Alarm element status

↪ CLI Command List

9. SHOWLOGS Command

The showlogs command allows you to display system event notifications that have been generated by 12Gbps SAS JBOD enclosure.

Syntax: CLI>showlogs [DisplayMode(hex, detail, default)]

CLI>showlogs

```
CLI>showlogs
<0:00:00:46.811>:SES Log:
ID:04-Fan Fault:    0(RPM)

<0:00:00:46.842>:SES Log:
ID:05-Fan Fault:    0(RPM)

<0:00:00:53.483> :SES Log:
ID:08-Voltage Fault:      0(mV)

<8:00:10:13.139 >:SES Log:
ID:11-HDD Fault
```

10. CLEARLOGS Command

The clearlogs command allows you to clear system event logs that generated by 12Gbps SAS JBOD enclosure.

Syntax: CLI>clearlogs

```
CLI>
CLI>clearlogs

CLI>
```

[↪ CLI Command List](#)

11. FDL Command

12Gbps SAS JBOD enclosure has added the expander firmware update through the CLI on the external RS-232 port. Before you process the firmware update, there are two block regions that you can update expander firmware on 12Gbps SAS JBOD controller.

- (1) CODE region - for FW file
- (2) MFGB region - for MFG file

The following firmware and data are available in the following filename format.

- (1) FW file (CODE) : UT-S3_24xx_YYY.fw
(Note: YYY is firmware revision, ex: UT-S3_24xx_008.fw)
- (2) MFG file (MFGB) : UT-S3_24xx_mfg_ZZZ.bin
(Note: ZZZ is SDK revision, ex: UT-S3_24xx_mfg_008.bin)

To update the expander controller firmware, follow the procedure below:

Syntax: all the commands please type in lower case

CLI>fdl { code | mfgb } offset[Enter]

Then use XModem/(Checksum) protocol transmit file to update ROM Region

The following procedures are used to update firmware through the RS-232:

Update SAS expander CODE region:

- A. One command to update firmware. Step as follow,
- B. Issue download & update command under "CLI>".

CLI>fdl code 0

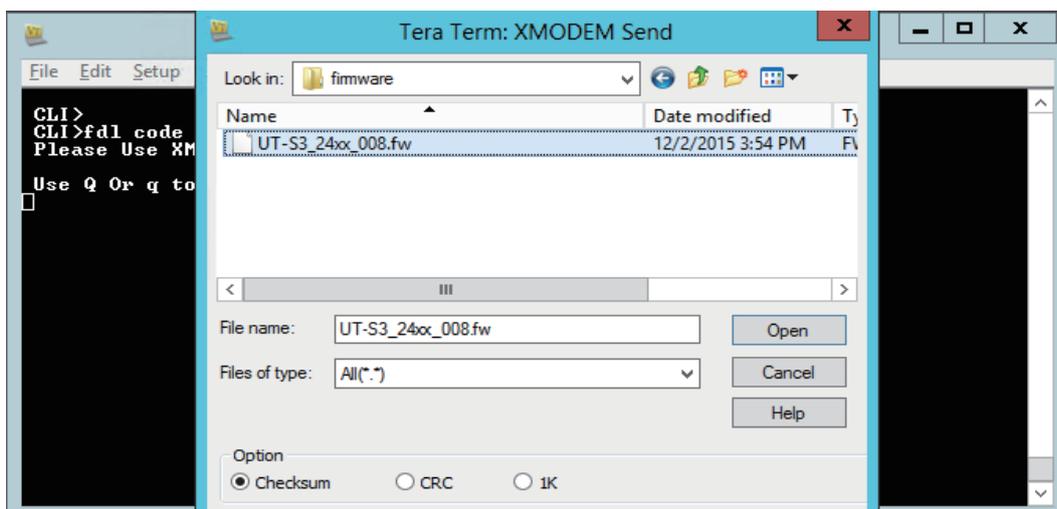
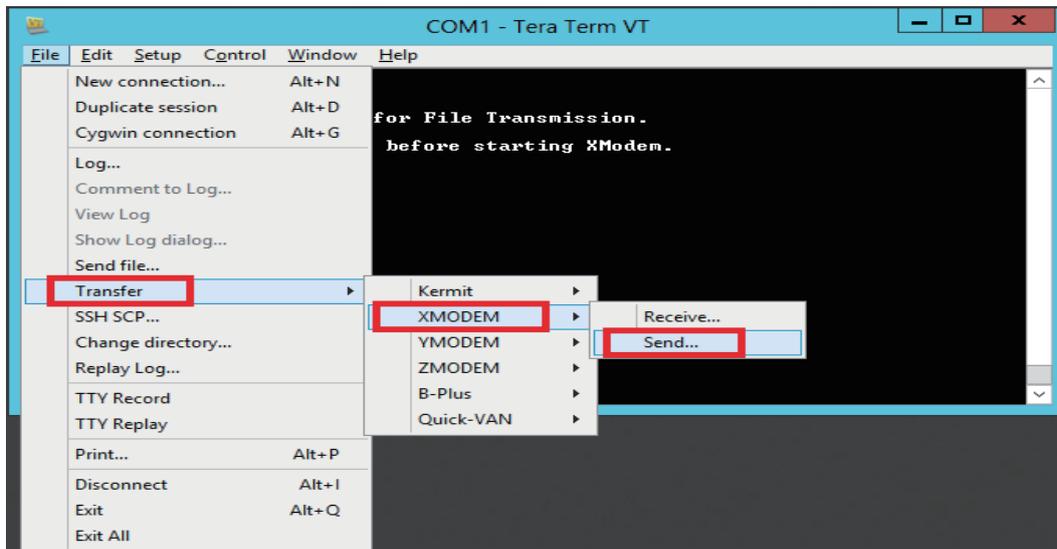
```
CLI>
CLI>fdl code 0
Please Use XModem Protocol for File Transmission.

Use Q Or q to quit Download before starting XModem.
```

<-----expander prompt for ready to receive file to update.

C. Then under Tera Term program, use the pull down menu item

“File” → **“Transfer”** → **“XMODEM”** → **“Send”** when dialog box prompts, choose and the file in the directory then press **“send”** .



· If the expander receives the file under the timeout limit (60s), the process starts.

D. You can also cancel the program step by type 'q'.

E. If the transfer process complete, the transferred data is updated. Cold-start expander (Power cycle again) to take effect.

↪ CLI Command List

Update SAS expander MFGB region:

A. One command to update firmware. Step as follow,

B. Issue download & update command under "CLI>".

CLI>fdl mfgb 0

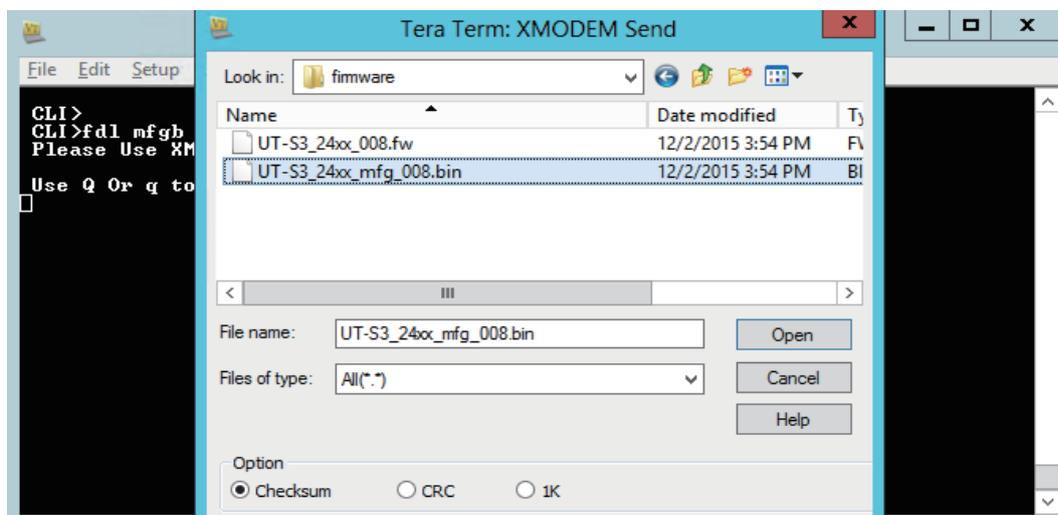
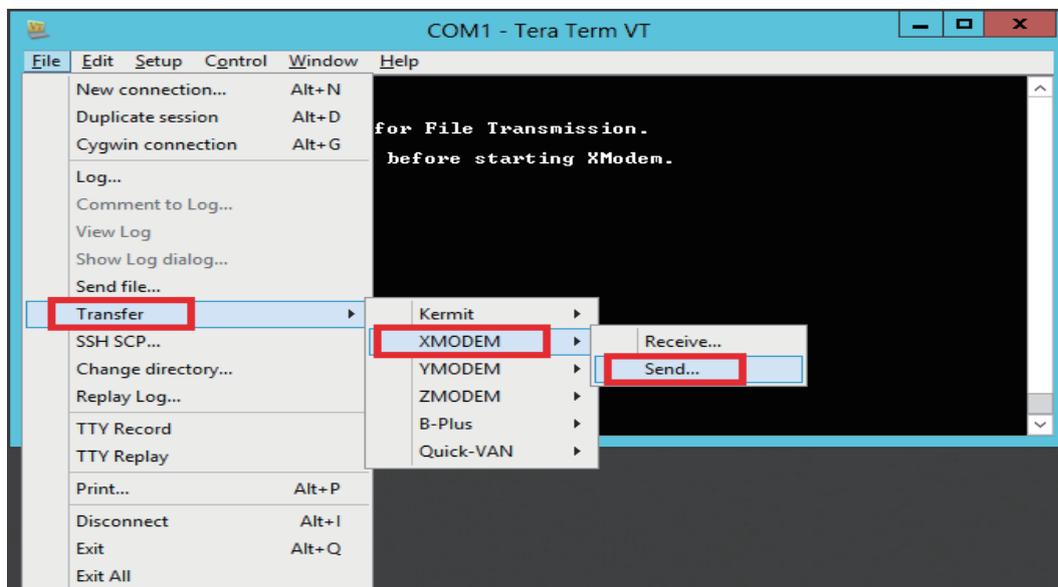
```
CLI>
CLI>fdl mfgb 0
Please Use XModem Protocol for File Transmission.

Use Q Or q to quit Download before starting XModem.
```

<-----expander prompt for ready to receive file to update.

C. Then under Tera Term program, use the pull down menu item

"File" → "Transfer" → "XMODEM" → "Send" when dialog box prompts, choose and the file in the directory then press "send" .



· If the expander receives the file under the timeout limit (60s), the process starts.

D. You can also cancel the program step by type 'q'.

E. If the transfer process complete, the transferred data is updated. Cold-start expander (Power cycle again) to take effect.

CLI Command List

12. HSPC Command (HDD Slot Power Control)

The hspc command can set or report power state of each HDD slot in the 12Gbps SAS JBOD enclosure.

Syntax: CLI>hspc Slot(D) { on | off }

Slot(D) : HDD Slot Index from 1 ~ 24

→ Show Current HDD Slot Power Status

CLI>hspc

```
CLI>
CLI>hspc
HDD Slot Power Status:
=====
SLOT                STATUS
=====
01                POWER ON
02                POWER ON
03                POWER ON
04                POWER ON
05                POWER ON
06                POWER ON
07                POWER ON
08                POWER ON
09                POWER ON
10                POWER ON
11                POWER ON
12                POWER ON
13                POWER ON
14                POWER ON
15                POWER ON
16                POWER ON
17                POWER ON
18                POWER ON
19                POWER ON
20                POWER ON
21                POWER ON
22                POWER ON
23                POWER ON
24                POWER ON
```

→ Turn Off Power of HDD Slot 2 and check status again

CLI>hspc 2 off

```
CLI>
CLI>hspc 2 off

Power off HDD slot 2
```

CLI>hspc

```
CLI>
CLI>hspc
HDD Slot Power Status:
=====
SLOT                STATUS
=====
01                  POWER ON
02                  POWER OFF
03                  POWER ON
04                  POWER ON
05                  POWER ON
06                  POWER ON
07                  POWER ON
08                  POWER ON
09                  POWER ON
10                  POWER ON
11                  POWER ON
12                  POWER ON
13                  POWER ON
14                  POWER ON
15                  POWER ON
16                  POWER ON
17                  POWER ON
18                  POWER ON
19                  POWER ON
20                  POWER ON
21                  POWER ON
22                  POWER ON
23                  POWER ON
24                  POWER ON
```

→ Turn On Power of HDD Slot 2

CLI>hspc 2 on

```
CLI>
CLI>hspc 2 on

Power off HDD slot 2
```

13. ETH Command

Show or Set Ethernet port configuration.

* The default IP address for NS388S's LAN (RJ-45) port is 192.168.10.1

Syntax: CLI>eth <ipaddr(*)> <subnet(*)> <gateway(*)>

→ Show Ethernet Configuration

CLI>eth

When Ethernet port link is down

```
CLI>
CLI>eth

=====
Physical Address . . . . . : 38-26-2B-10-00-35
Ethernet Link Status . . . . . : Autonegotiating
=====
```

When Ethernet port link is up

```
CLI>
CLI>eth

=====
Physical Address . . . . . : 38-26-2B-10-00-35
IP Address . . . . . : 192.168.100.206
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.100.253
Ethernet Link Status . . . . . : Up
Ethernet Link Speed . . . . . : 100 Mbps
Ethernet Link Duplex Mode . . : Half
=====
```

→ Set Ethernet IP Address, Subnet Mask and Gateway

CLI>eth 192.168.100.206 255.255.255.0 192.168.100.253

```
CLI>
CLI>eth 192.168.100.206 255.255.255.0 192-168.100.253
Set Ethernet - save configuration ok
```

[↪ CLI Command List](#)

14. RESET Command

Reset 12Gbps SAS JBOD controller.

Syntax: CLI>reset

```
CLI>  
CLI>reset
```

[↪ CLI Command List](#)

4. Q & A

Question 1:

When one of the fans breaks down, the buzzer inside the SAS Expander enclosure will beep to alert the administrator; how to mute the beep?

Answer:

Press the alarm mute button on SAS Expander at rear of NS388S enclosure as Figure 4-1 to silence the beeping alert.

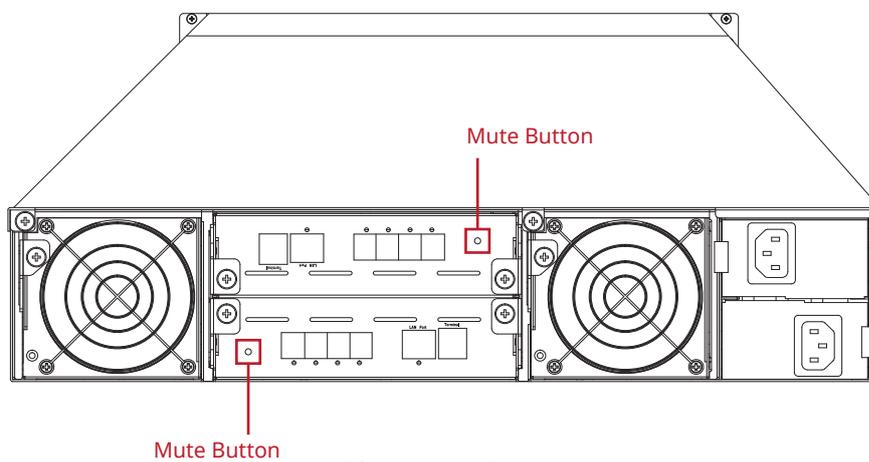


Figure 4-1

Question 2:

When one of the PSU units breaks down, power supply's buzzer will beep to alert the administrator; how to mute the beep?

Answer:

Press the alarm mute button on SAS Expander at rear of NS388S enclosure as Figure 4-1 to silence the beeping alert.



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