

NS780S-G3

Desktop 16-Bay PCIe to SAS/SATA Enclosure



User Manual

First edition, Oct. 2019

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1. Overview

The NS780S-G3 is a desktop 16-bay PCIe to SAS/SATA enclosure with high-speed data transfer rate and available for large storage capacity. Providing RAID data protection solution, the 16-bay storage fully applies to video editing fields of 8K UHD (7680 × 4320), 4K (4096×2160), HD (1920×1080), and 3D animation. Featuring easy setup of the enclosure, the NS780S-G3 can be easily connected to host computer through only one data cable connectivity.

2. Package Checklist

Before installing this unit, verify the package contains the following items.

- A. NS780S-G3 Enclosure × 1
- B. HDD tray (installed in NS780S-G3; compatible with 3.5" and 2.5" HDDs) × 16
- C. HDD mounting screws
- D. PCIe 3.0 ×8 host adapter × 1
- E. Low profile bracket × 1
- F. PCIe 3.0 ×8 data cable (1.5 meter) × 1
- G. Internal mini-SAS to mini-SAS data cable × 4
- H. Power cord × 1

3. Panel Layout



5. Global HDD LED

- Reading/writing – blue
- Periodic access – flashing blue
- HDD failure – red (go to [page 19](#), for the detail)
- Rebuilding – interlacing of flashing blue and flashing red

4. Temperature LED

- Green – temperature normal
- Red – Over-temperature (higher than 50°C)

3. Fan LED

- Green – fan normal
- Red – fan failure (low frequency of RPM or stop) (go to [page 18](#), for the detail)

2. Buzzer mute button

1. Power on/off button (display)

- Blue – power on
- No light – power off

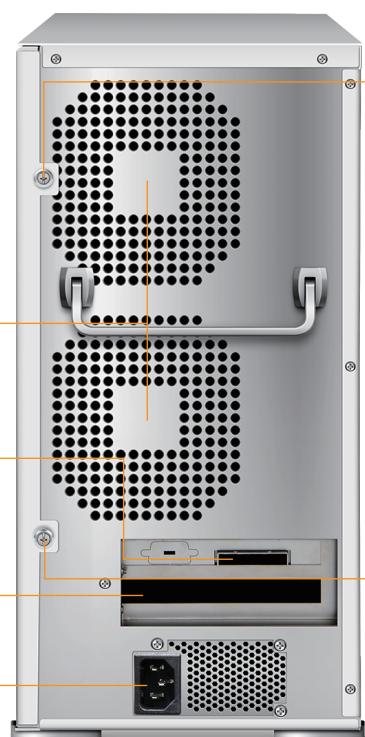
10. Thumbscrews to loosen/tighten the side door

9. 120x120x25 mm hot-swappable cooling fans

8. Target card with external PCIe ×8 connector for host connection

7. Slot for RAID controller card

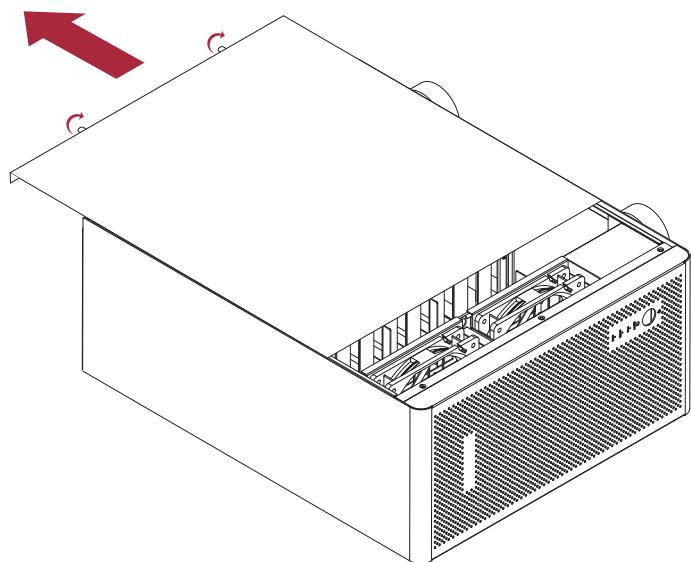
6. Power receptacle



4. Enclosure Setup

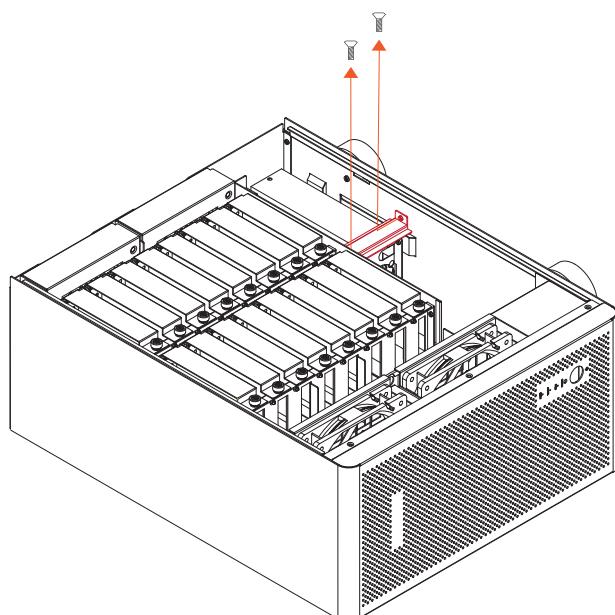
1. Remove the NS780S-G3 from its packaging, and place the enclosure on the even surface close to the computer.

2. Loosen the two thumbscrews and remove the side door from NS780S-G3.

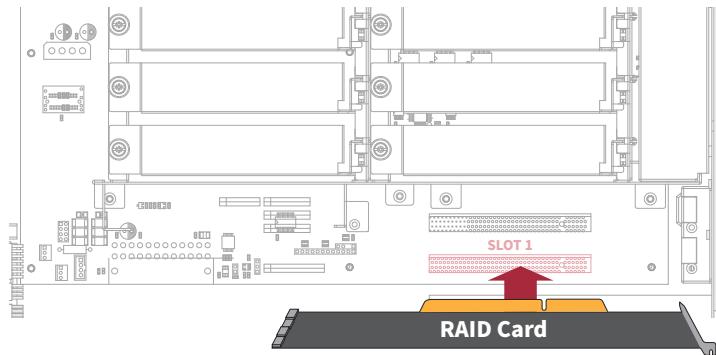


· RAID Card/HBA Card Installation

3. Detach the pillar under the sixteen drive trays by unscrewing the two screws at top and at the bottom side of the pillar.



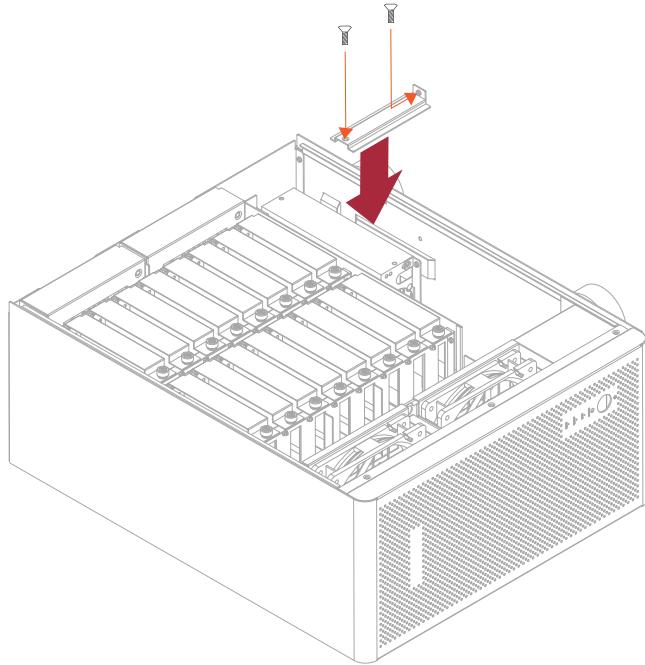
4. Install one SAS/SATA RAID card into the PCIe ×16 slot [labeled SLOT 1 (RAID Card)] on the backplane of NS780S-G3, and tighten the RAID card with the screw on RAID card's bracket.



5. Connect the four internal mini-SAS to mini-SAS data cables between RAID HBA and NS780S-G3 backplane. Connect the topmost mini-SAS connector (labeled SAS Port 1) on backplane to Channel 1~4 mini-SAS connector on RAID HBA, the second connector (labeled SAS Port 2) to Channel 5~8 mini-SAS connector on RAID HBA, the third (SAS Port 3) to Channel 9~12 mini-SAS connector on HBA, and the fourth (SAS Port 4) to Channel 13~16 mini-SAS connector on HBA.

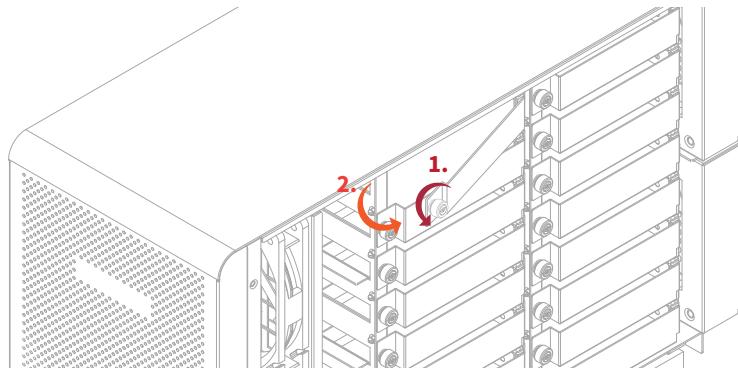


6. Restore the pillar back to the original state by tightening the two screws at top and at the bottom side of the pillar.

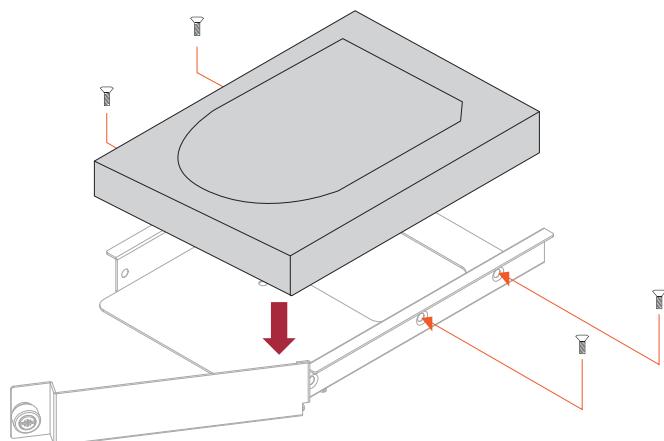


· Hard Drive Installation

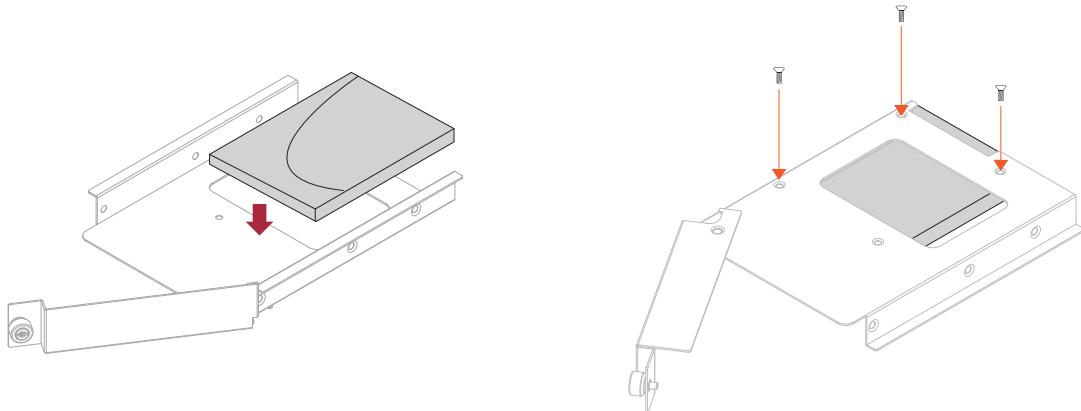
7. Loosen the thumbscrew on the drive tray, and then pull the tray out of the enclosure.



8. Place the drive tray on a flat surface, and then attach the hard drive into the tray.



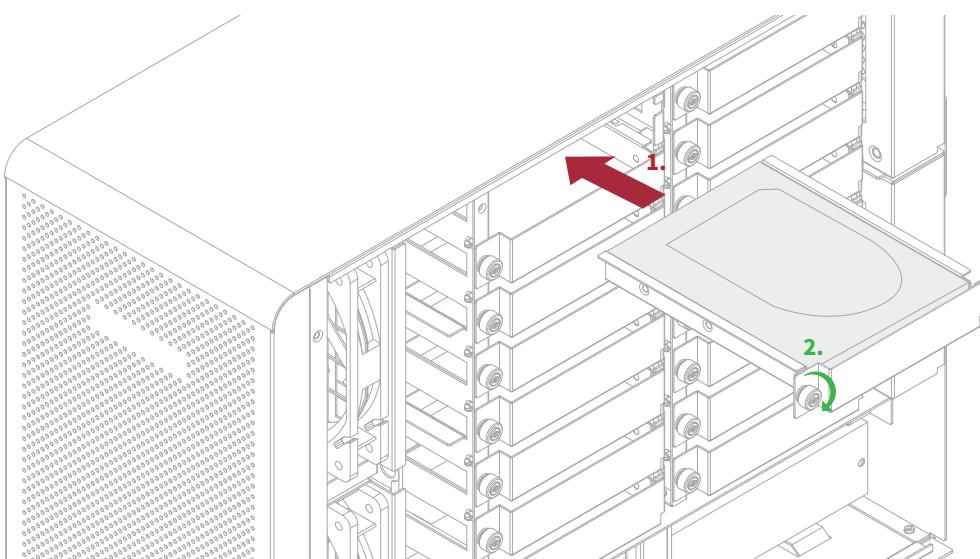
9. Adopt four of the screws provided, and then fasten the HDD on the drive tray. Tighten each screw to fasten the tray snugly to the hard drive. Do not tighten the screws overly. For 3.5" HDDs, tighten the four screws on the sides of the tray; for 2.5" HDDs, tighten the three screws on the bottom of the tray as shown in the picture below.



WARNING:

You must verify the heads of the four screws are level with the side (for 3.5" HDD) or the bottom (for 2.5" HDD) of the drive tray while the HDDs are attached to the trays; otherwise, a screw may take hold of the tray from the side and prevent pulling the tray out of the array.

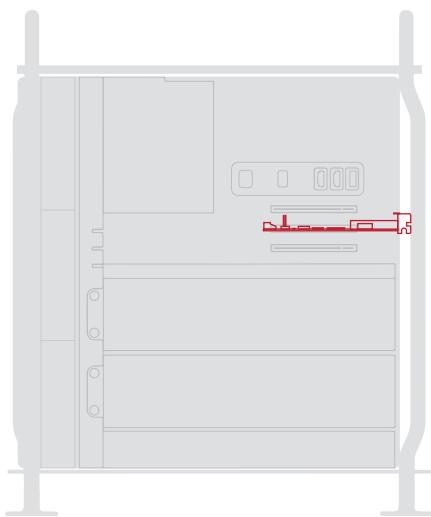
10. Insert the drive tray containing the HDD into the NS780S-G3 enclosure correctly, and then tighten the thumbscrew on the tray.



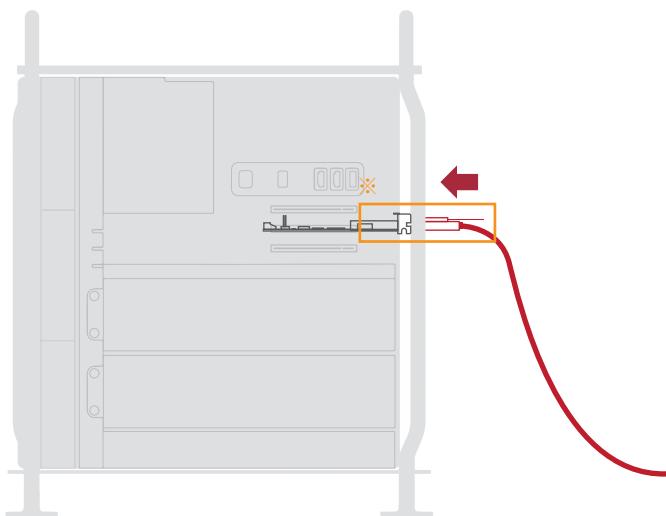
11. Go over steps 7 to 10 again for further drives.

5. Host Adapter Installation

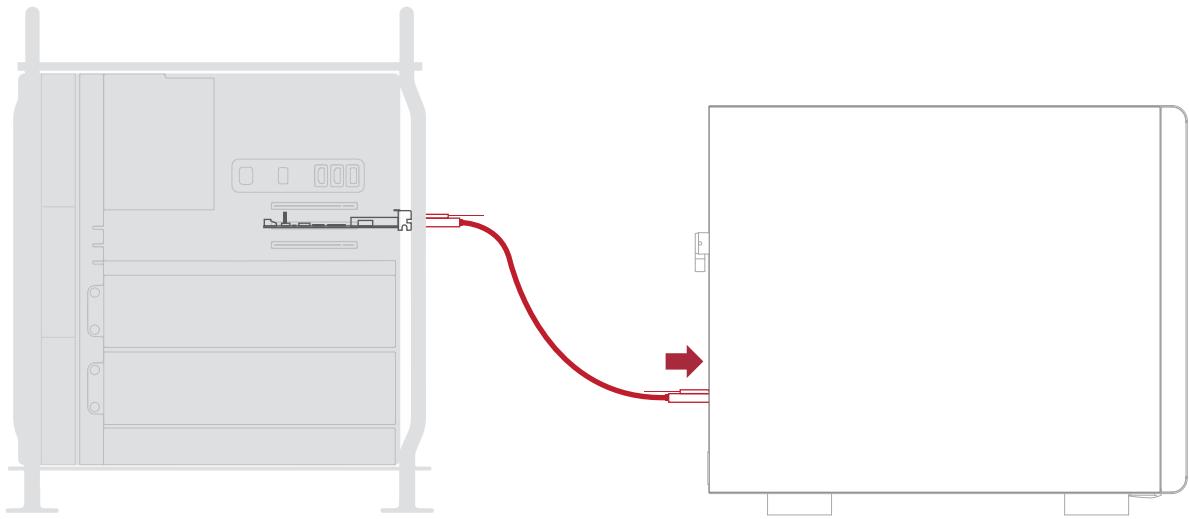
1. Install Netstor NS780S-G3 PCIe 3.0 ×8 host adapter into an available PCIe ×8 slot (compatible with PCIe 3.0 ×16 slot) in the computer, and then secure the host adapter with a screw.



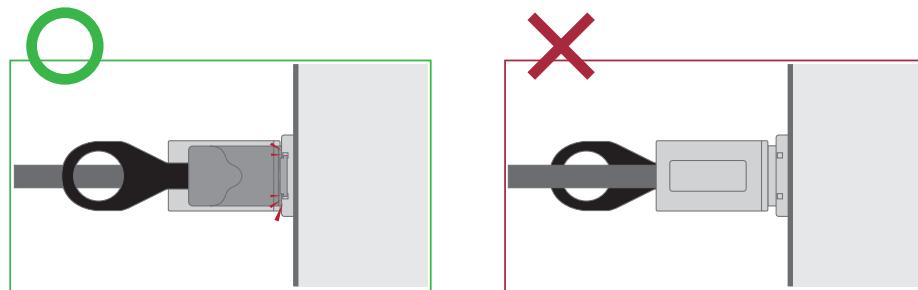
2. Connect one end of the PCIe ×8 data cable to the external PCIe 3.0 ×8 connector on NS780S-G3 host adapter on computer. Verify the connector is firmly conjoined.



3. Connect the other end of the PCIe ×8 data cable to the external PCIe 3.0 ×8 connector on NS780S-G3 enclosure.



※ Note the ring-pull of the external PCIe ×8 data cable connector must be at the same side as Nestor host card and target card's obverse side when cable is connected to the host/target card.

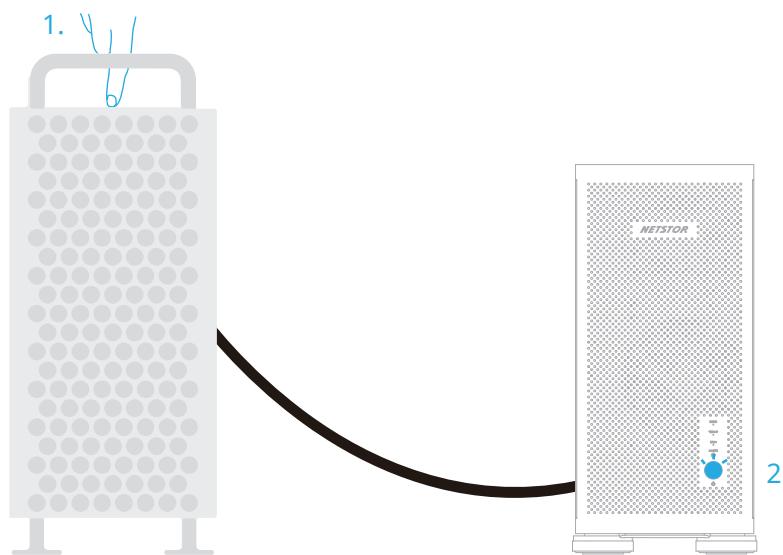


6. Power On/Off

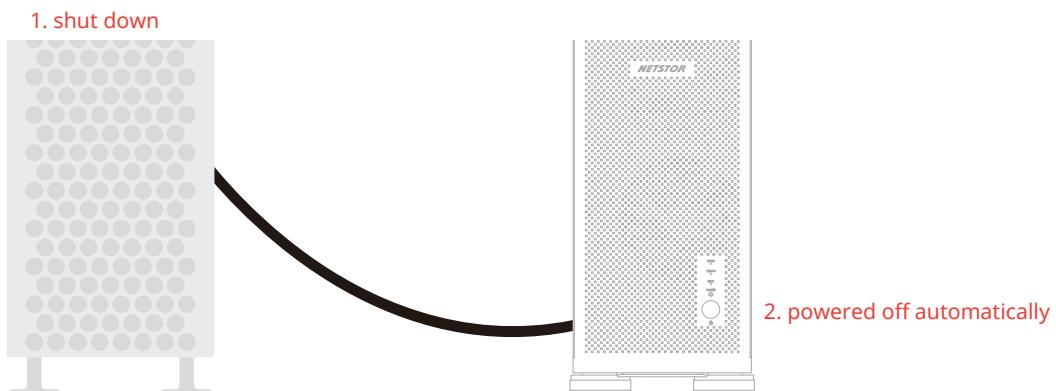
There are two ways to power on/off the NS780S-G3. One is to power on/off the NS780S-G3 by the host computer; the other is to power on/off the Netstor unit manually. Switch SW1-4 on the backplane within the Netstor unit determines whether to power the Netstor storage on or off by host or manually. The default setting is set to turning on or off by host.

6.1 Power on/off by host (Default)

1. Connect one end of power cord to the power cord receptacle at rear of NS780S-G3 enclosure, and the other end of power cord to the power outlet.
2. Power on the host computer, and then the NS780S-G3 storage will be powered on along automatically.



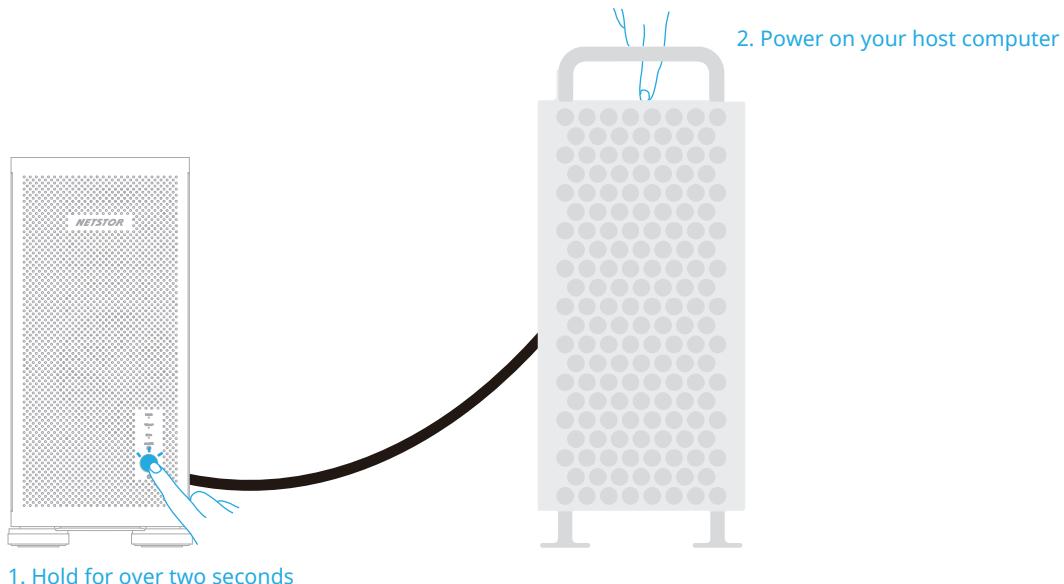
3. When the host computer is shut down, the Netstor storage will be powered off automatically as well.



6.2 Power on/off manually (go to [page 20](#). to set SW1-4 to OFF for effect)

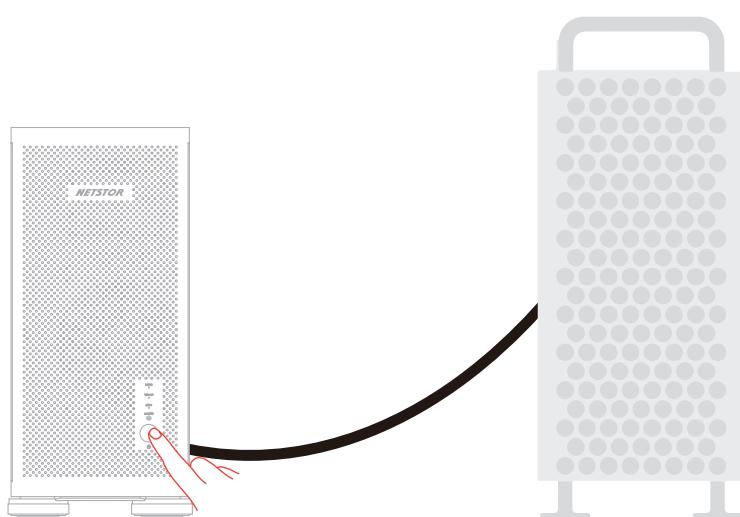
1. Connect one end of power cord to the power cord receptacle at rear of NS780S-G3 enclosure, and the other end of power cord to the power outlet.

2. Press and hold NS780S-G3 storage's front LED button for over two seconds until the LED button turns blue light to power on the Netstor unit. And then power on your host computer.



3. After the computer is shut down, press and hold NS780S-G3 enclosure's front LED button for over two seconds until the LED button shows no light to power off the storage.

1. Host computer shut down



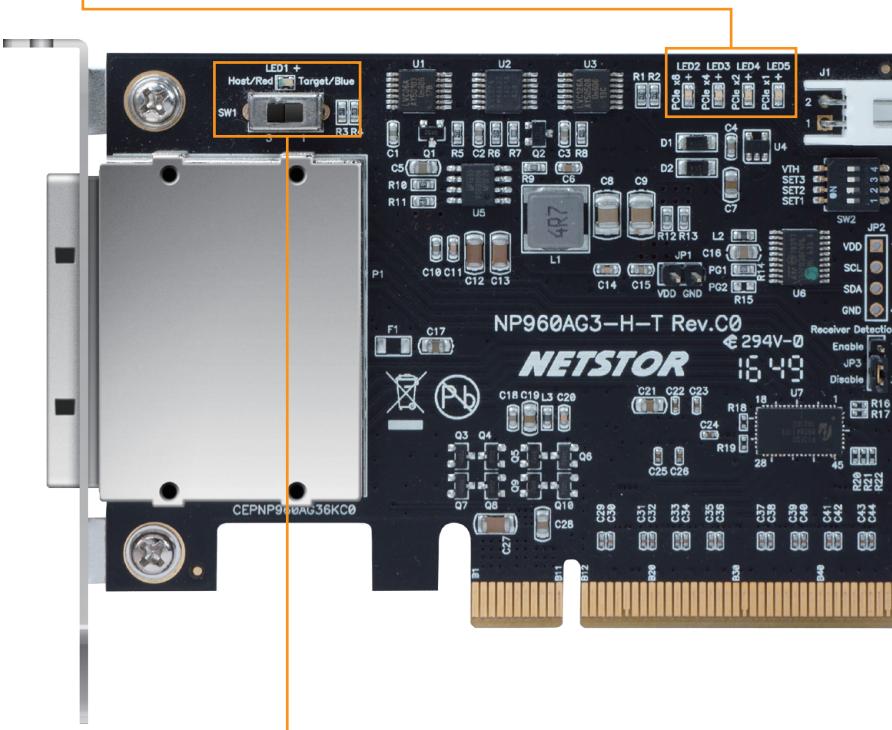
7. Operation

• LED Status on Host card and Target card



LED2 ~ LED5 show solid green light: PCIe ×8 connection between computer and NS780S-G3 is linked.

LED2 ~ LED5 not showing light: PCIe connection between computer and NS780S-G3 is **NOT** linked.



SW1 switch:

When SW1 switch is turned to the left position, the NP960AG3 card will be set as the host card. The LED1 will show red light to indicate the NP960AG3 card is configured as the host card.



As SW1 switch is turned to the right position, the NP960AG3 card will be set as the target card. The LED1 will show blue light to indicate the NP960AG3 card is configured as the target card.

· macOS operating system

Verify the RAID card in NS780S-G3 is recognized by Mac Pro. Click Apple icon at the top menu bar, select **About This Mac**, and click **System Report** button. Click **PCI** in the left column, as the RAID card info appears in the information area, it means Netstor storage's RAID controller card is recognized correctly by Mac Pro.

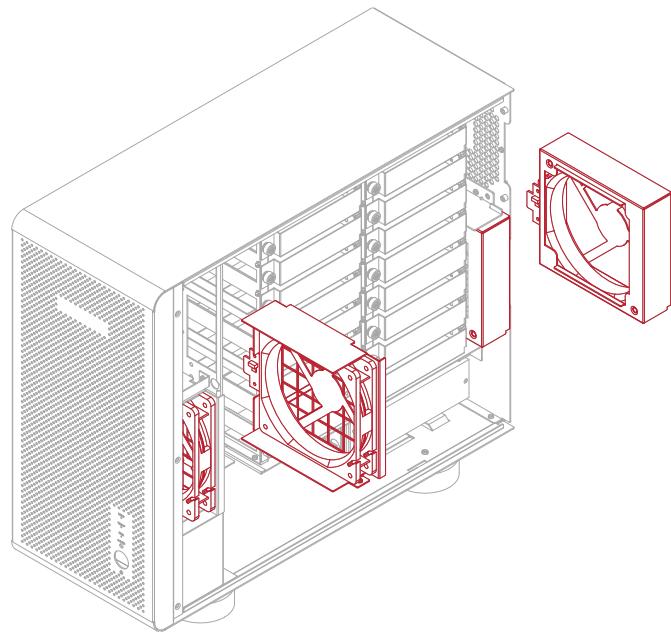
· Windows operating system

1. Verify the RAID card in NS780S-G3 is recognized by host computer. Right click **This PC**, and select **Manage**. As window of Computer Management pops up, click **Device Manager** in the left column, click **View** at the top menu bar, and select **Devices by connection**.
2. Click **ACPI x64-based PC**, select **Microsoft ACPI-Compliant System**, and click **PCI Express Root Complex**. Open the PCI Express Root Port, and the RAID card in NS780S-G3 will be shown, meaning the storage's RAID card is recognized correctly by the host computer.

To configure the RAID setting for the storage, please refer to the user's manual of the RAID controller card that is installed in NS780S-G3.

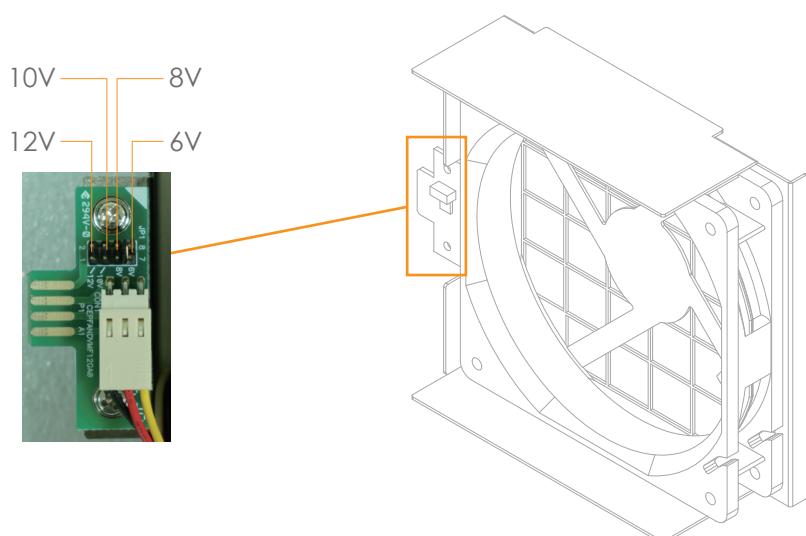
8. Fan Speed Adjustment

There are four hot-swappable 120×120×25 mm cooling fans in the front and in the rear of the NS780S-G3 enclosure for ventilation. The cooling fan can simply be drawn out of the enclosure by pulling the L type metal handle on the fan module.



• The front two fans

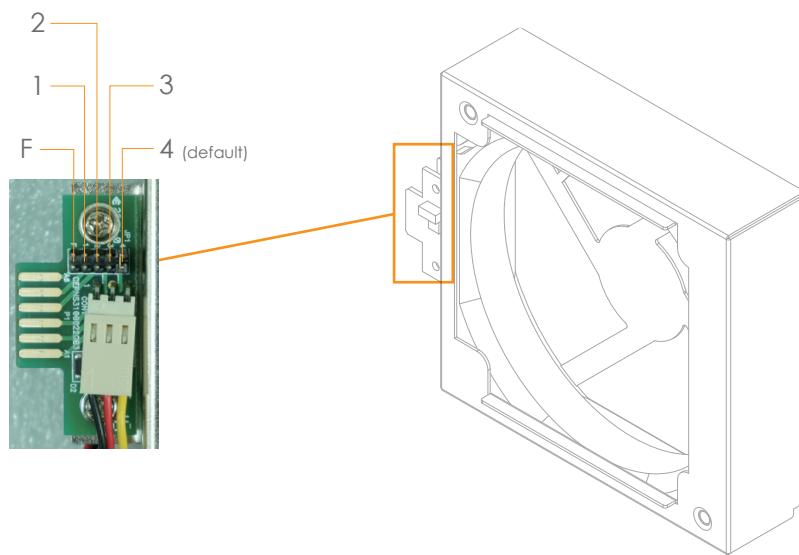
The front 120×120×25 mm cooling fan speed can be adjusted. Pull out the fan module, there are four sets of jumpers labeled with 6V, 8V, 10V, 12V from top to bottom on the fan connector board. The default setting is the jumper being placed over pin 7 and 8 for label 6V for slowest speed. The speed increases from label 8V to label 12V. As jumper is not placed over pins, the fan will spin at 12V full speed.



• The rear two fans

To adjust the fan speeds, pull the rear fan module out of the enclosure. There are five sets of jumpers labeled with 4, 3, 2, 1, F sequentially from top to bottom on the fan connector board.

The default setting is the jumper being placed over pin 9 and pin 10 for label 4, meaning the slowest speed of fan. The fan speeds increase from label 3 to label 1. When the jumper is placed over pin 1 and pin 2 for label F, the fan spins at full speed. If all the pins are open (no jumper being placed over the pins), the fan will not spin.

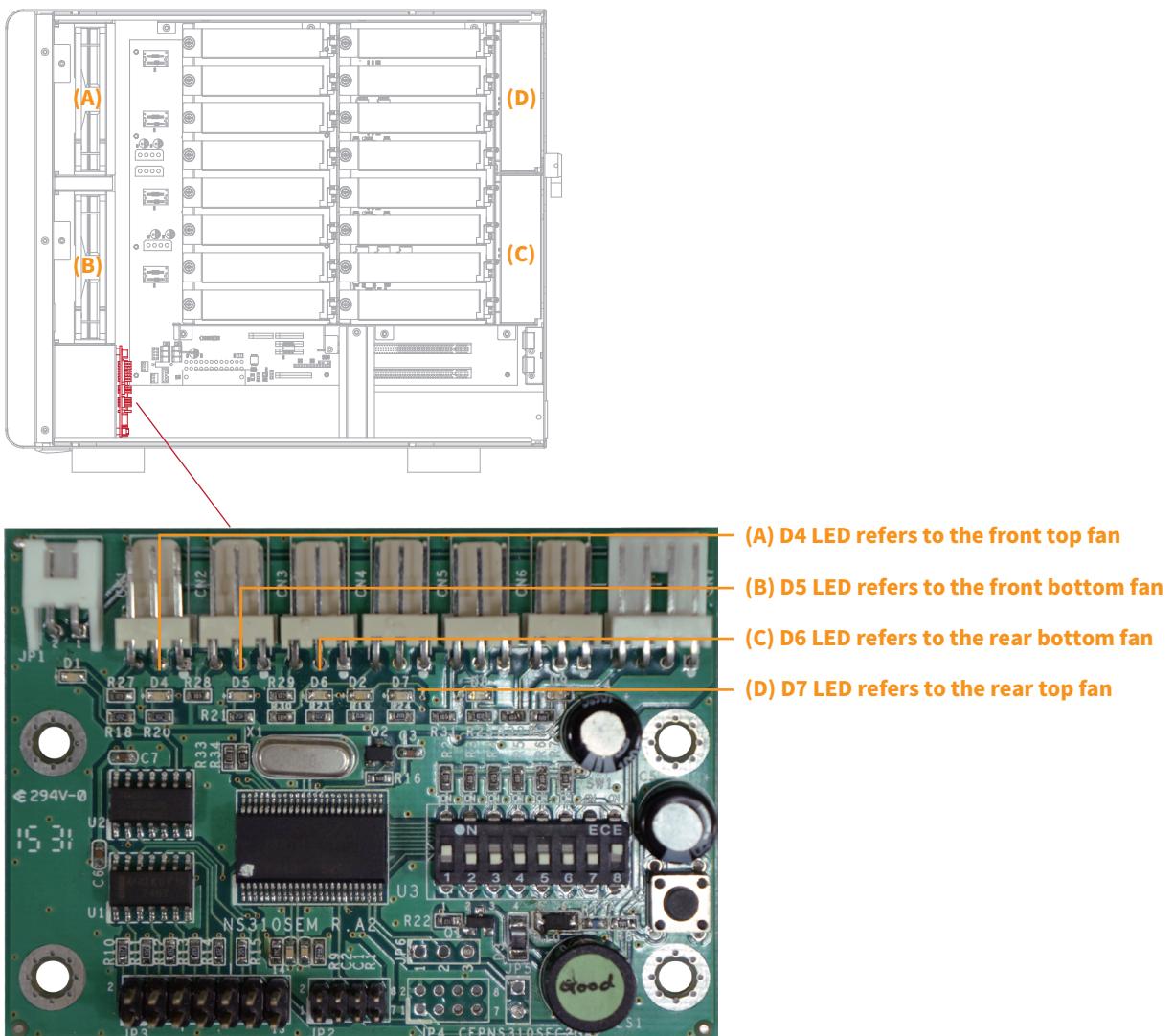


9. Troubleshooting

9.1 Fan LED showing red light

When one of the cooling fans within Netstor unit fails, the fan LED in front of NS780S-G3 enclosure will show red light. The approach to distinguish which cooling fan in the Netstor unit has the issue is given as follows.

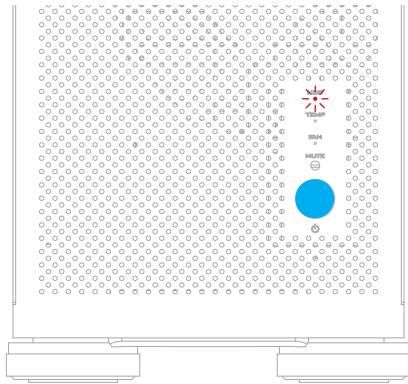
1. Inside the Netstor storage enclosure, the front bottom part, there is an environmental control board; locate this board.
2. On the environmental control board, there are four LEDs indicating the four 12x12 cm cooling fans inside the Netstor unit.



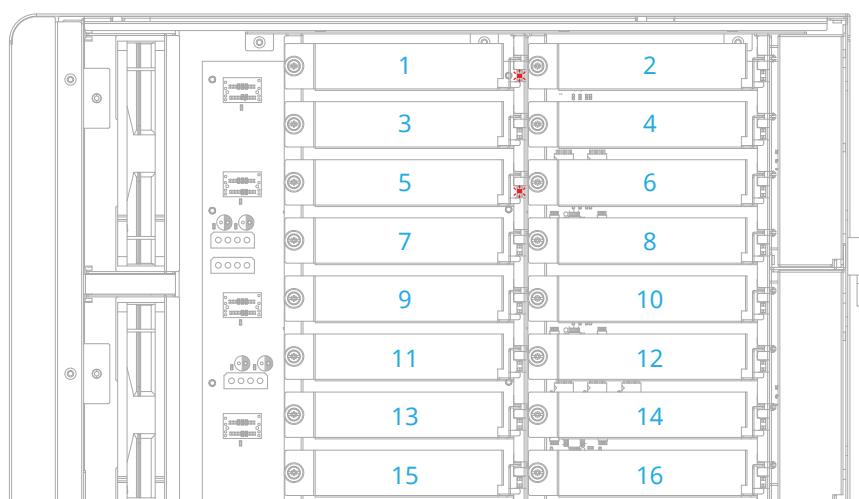
As either of the above four LEDs shows red light, the corresponding cooling fan fails.

9.2 Global HDD LED showing red light

When one of the HDDs within Netstor unit fails, the Global HDD LED in front of NS780S-G3 enclosure will show red light. At this time, here is the method to distinguish which HDD in the Netstor unit has the issue supposing that all the sixteen bays are populated with drives.



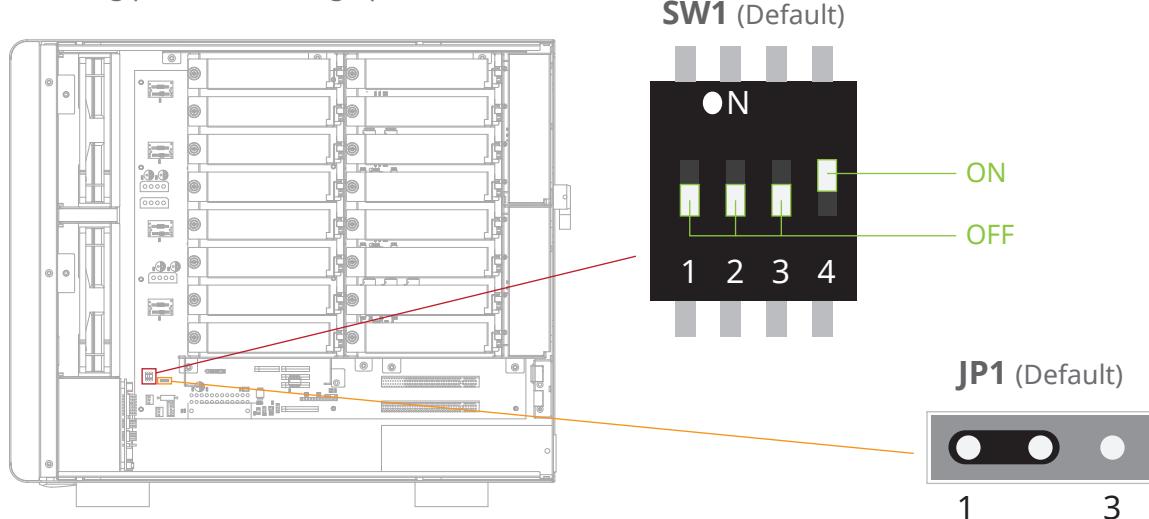
1. When both computer and Netstor unit are at the powered on status, enter NS780S-G3 RAID controller card's web GUI. (here take Areca RAID card's GUI for example) Click on 'Information' in the left column, and then click on 'RAID Set Hierarchy'. At this moment, in the GUI it will show, among all the sixteen drives, which number of HDD fails. Remember the number of the failure HDD.
2. Open Netstor unit's side door. All the sixteen drive bays are labeled with numbers from 1 through 16. As you have known the number of HDD that fails in the web GUI from the last step, locate the number of drive bay in the Netstor unit, and you will see, with the number of the failure drive, it will show red light.



※ Note for the Global HDD LED to be effective, the SAS/SATA RAID controller card to be utilized in the Netstor unit must support SGPIO function.
If the RAID card doesn't support SGPIO function, then the Global HDD LED won't work.

Appendix: The Functions on Backplane

There is one switch module on the backplane of NS780S-G3 providing four functions on SW1-1, SW1-2, SW1-3, and SW1-4. The description for each function is given in the following point one through point four.



1. Function of Backplane Drive Fault LED (SW1-1)

There are sixteen drive fault LEDs beside each HDD connector on the backplane inside the Netstor unit.

This switch determines whether the drive fault LED on the backplane appears to be permanent red light or flashing red light when the HDD fails. The default setting is set to be drive fault LED showing flashing red light.

The situation of the drive fault LED appearing varies according to different RAID card employed.

2. Function of SAS HDD act state LED on Backplane (SW1-2)

There are sixteen HDD act state LEDs beside each HDD connector on the backplane inside the Netstor unit.

This switch determines whether the HDD act state LED on the backplane appears to show blue light or no light when the SAS HDD is inserted into the NS780S-G3. The default setting is set to be SAS HDD act state LED showing no light.

3. Function of LED act source (SW1-3)

This switch determines whether the source of the HDD access indicator of the Global HDD LED in front of NS780S-G3 comes from RAID card's SGPIO or the HDD itself. The default setting is set to be the source coming from the HDD itself.

4. Function of Power on/off by Host or Manually (SW1-4)

This switch determines whether to power Netstor NS780S-G3 storage on or off by host or manually. The default setting is set to be powering on/off by host.

5. Global HDD LED fault indicator jumper

This jumper determines whether the Global HDD LED in front of the NS780S-G3 storage appears to show red light or no light when the HDD fails.

The default setting is the jumper being placed over pin 1 and pin 2, meaning the Global HDD LED in front of the NS780S-G3 storage showing red light when the HDD fails.

If you have any further questions, please contact your regional distributor, or Netstor Technology, Taiwan.



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