



# XCubeFAS Series Hardware Owner's Manual

Applicable Models:  
XF2026D



QSAN Technology, Inc.  
[www.QSAN.com](http://www.QSAN.com)



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## **July 2018**

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# Notices

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This XCubeFAS hardware owner's manual is applicable to the following XCubeFAS models:

## XCubeFAS Storage System 2U 19" Rack Mount Models

Model Name	Controller Type	Form Factor, Bay Count, and Rack Unit
XF2026D	Dual Controller	SFF 26-disk 2U Chassis

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## Regulatory Statements

### FCC Statement

This device has been shown to be in compliance with and was tested in accordance with the measurement procedures specified in the Standards and Specifications listed below.

Technical Standard: FCC Part 15 Class A

IC ICES-003

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。VCC1-A

警告：這是甲類的資訊產品。在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

### CE Statement

This device has been shown to be in compliance with and was tested in accordance with the measurement procedures specified in the Standards and Specifications listed below.

Technical Standard: EMC DIRECTIVE 2014/30/EU  
(EN55022 / EN55024)

### UL Statement

Rack Mount Instructions - The following or similar rack-mount instructions are included with the installation instructions:

1. Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. Circuit Overloading – Careful consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).




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**CAUTION:**

The main purpose of the system left and right ears are for 19" rack use only. Do NOT use those ears to carry or transport the system.

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The ITE is not intended to be installed and used in a home, school or public area accessible to the general population, and the thumbscrews should be tightened with a tool after both initial installation and subsequent access to the panel.

Warning: Always remove all power supply cords before service

This equipment intended for installation in restricted access locations.

- Access should only be allowed by qualified SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.
- Recommended operation temperature: 0 ~ 40°C (31.99 ~ 103.99°F); operation rating (100-127 Vac, 50-60Hz, 10.0A; 200-240 Vac, 50-60Hz, 5.0A)




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**CAUTION: (English)**

Risk of explosion if battery is replaced by incorrect type. Please replace the same or equivalent type battery use and dispose of used batteries according to the instructions.

**ATTENTION: (French)**

IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UNE BATTERIE DE TYPE INCORRECT. METTRE AU REBUT LES BATTERIES

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USAGEES CONFORMEMENT AUX INSTRUCTIONS.

**VORSICHT: (German)**

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.  
Entsorgung gebrauchter Batterien nach Anleitung.

**ADVERTENCIA: (Spanish)**

Las baterías pueden explotar si no se manipulan de forma apropiada. No desmonte ni tire las baterías al fuego. Siga las normativas locales al desechar las baterías agotadas.

**警告: (Simplified Chinese)**

電池如果更換不正確會有爆炸的危險，請依製造商說明處理用過之電池。

**警告: (Traditional Chinese)**

電池如果更換不正確會有爆炸的危險，請依製造商說明處理用過之電池。

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**INFORMATION:**

QSAN provides limited warranty for QSAN-branded hardware products:

- System hardware and peripheral product (s): **3** years limited warranty from date of original purchase.
- Battery Backup Module or super capacitor module (applies for cache-to-flash module): **1** year limited warranty from date of original purchase.

For more detail warranty policy, please refer to QSAN official web site:

<https://qsan.com/warranty>

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# Preface

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## About This Manual

This manual provides technical guidance for designing and implementing QSAN XCubeFAS series all flash array system, and it is intended for use by system administrators, SAN designers, storage consultants, or anyone who has purchased these products and is familiar with servers and computer networks, network administration, storage system installation and configuration, storage area network management, and relevant protocols.



### CAUTION:

Do NOT attempt to service, change, disassemble or upgrade the equipment's components by yourself. Doing so may violate your warranty and expose you to electric shock. Refer all servicing to authorized service personnel. Please always follow the instructions in this owner's manual.

## Related Documents

There are related documents which can be downloaded from the website.

- [All XCubeFAS Documents](#)
- [XCubeFAS QIG \(Quick Installation Guide\)](#)
- [XCubeFAS Hardware Owner's Manual](#)
- [XCubeFAS XEVO 1.0 User's Manual](#)
- [Compatibility Matrix](#)
- [White Papers](#)
- [Application Notes](#)

## Technical Support

Do you have any questions or need help trouble-shooting a problem? Please contact QSAN Support, we will reply to you as soon as possible.

- Via the Web: <https://qsan.com/support>

- Via Telephone: +886-2-7720-2118 extension 136  
(Service hours: 09:30 - 18:00, Monday - Friday, UTC+8)
- Via Skype Chat, Skype ID: qsan.support  
(Service hours: 09:30 - 02:00, Monday - Friday, UTC+8, Summer time: 09:30 - 01:00)
- Via Email: [support@qsan.com](mailto:support@qsan.com)

## Information, Tip, and Caution

This manual uses the following symbols to draw attention to important safety and operational information.



### INFORMATION:

INFORMATION provides useful knowledge, definition, or terminology for reference.

---



### TIP:

TIP provides helpful suggestions for performing tasks more effectively.

---



### CAUTION:

CAUTION indicates that failure to take a specified action could result in damage to the system.

---

## Conventions

The following table describes the typographic conventions used in this manual.

Conventions	Description
<b>Bold</b>	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click the <b>OK</b> button.
<i>&lt;Italic&gt;</i>	Indicates a variable, which is a placeholder for actual text provided

	by the user or system. Example: copy <source-file> <target-file>.
[ ] square brackets	Indicates optional values. Example: [ a   b ] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a   b } indicates that you must choose either a or b.
vertical bar	Indicates that you have a choice between two or more options or arguments.
/ Slash	Indicates all options or arguments.
underline	Indicates the default value. Example: [ <u>a</u>   b ]



# 1. Overview

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Thank you for purchasing QSAN Technology, Inc. products. The QSAN XCubeFAS series is user-friendly: it helps you manage your storage within just a few clicks, and if you are not available at your seat during the day, you may operate your XF2026D with your mobile device. It offers you the most superior storage services, available only to enterprise storage experts, that can help you to analyze the status of your business usage, preventing accidental damages caused by human negligence. With XF2026D, this highly scalable all-flash array solution, you can expand your storage as your business grows without ever requiring downtime or forced hardware upgrade every 3-5 years. Just have it today – enjoy your XF2026D.

## 1.1. XCubeFAS Series Product Overview

QSAN XCubeFAS series is an all-flash array system, the system is composed of system hardware and the XEVO operating system, the system hardware is a modular design and FRU (Field Replacement Unit) optimized. All the hardware modules are inside the rack mount chassis including: system controllers, front panel, rear panel, redundant power supply and fan modules, cache-to-flash module (by using battery backup module), and expansion slots for optional Fibre Channel or 10GbE host cards. This manual will direct you step by step to familiarize you with the XCubeFAS hardware components, how to install the system, carry out the initial configuration, and provide you with some quick maintenance guidelines.



### **INFORMATION:**

For how to use the XEVO operating system, please refer to the [XCubeFAS XEVO 1.0 User's Manual](#).

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XCubeFAS series supports several standard form factors:

- SFF (Small Form Factor): 26-bay 19" rack mount 2U chassis.



Figure 1-1 Form Factors of XCubeFAS Series Models

The following tables provide detailed information about all XCubeFAS Series models arranged by form factors.

Table 1-1 XCubeFAS Series Storage System 2U 19" Rack Mount Models

Model Name	Controller Type	Form Factor, Bay Count, and Rack Unit
XF2026D	Dual Controller	SFF 26-bay 2U Chassis

## 1.2. XCubeFAS Series Hardware Features

The following is a list of the key hardware components and optional components of the XCubeFAS series for reference.

- Dual-Active (Active/Active) controller design architecture
- Processor
  - XF2026 series: Intel Xeon 4-core processor (8-core processor model is also available)
- Standard system memory capacity
  - XF2026 series: DDR4 32GB, and up to 128GB per controller
- SAS 3.0 backplane board

- Built-in two 10GbE iSCSI ports per controller
- Redundant power supply units
- Redundant fan modules
- Storage capacity expansion with XCubeDAS XD5326 series 12Gb SAS RAID expansion enclosures
- Each controller has two host card slots allowing you to select your desired host cards configuration. Optional host cards are on the following.
  - 4 x 16Gb Fibre Channel (SFP+) ports (Slot 2 provides 20Gb bandwidth)
  - 2 x 16Gb Fibre Channel (SFP+) ports (Slot 2 provides 20Gb bandwidth)
  - 4 x 10GbE iSCSI (SFP+) ports (Slot 2 provides 20Gb bandwidth)
  - 2 x 10GBASE-T iSCSI (RJ45)
- A Cache-to-Flash module (BBM (Battery Backup Module) + flash module) is included for the protection of the system cache data in your XCubeFAS system

### 1.3. XCubeFAS Series Hardware Specifications

Following tables are hardware specifications of XF2026 series.

Table 1-2 XF2000 Series Hardware Specifications

Model name	XF2026D
Form Factor	2U 26-bay, SFF
RAID Controller	Dual-active controller
Processor	Intel Xeon 4-core processor (8-core processor model is also available)
Memory (per Controller)	DDR4 ECC 32GB, up to 128GB (four DIMM slots, insert two DIMMs or more will boost performance)
Host Connectivity (per Controller)	Optional Host Cards at Slot 1 (PCIe Gen3 x 8) <ul style="list-style-type: none"> <li>• 4 x 16Gb FC (SFP+) ports</li> <li>• 2 x 16Gb FC (SFP+) ports</li> <li>• 4 x 10GbE iSCSI (SFP+) ports</li> <li>• 2 x 10GbE iSCSI (RJ45) ports</li> </ul> Optional Host Cards at Slot 2 (PCIe Gen2 x 4) <ul style="list-style-type: none"> <li>• 4 x 16Gb FC (SFP+) ports<sup>1</sup></li> <li>• 2 x 16Gb FC (SFP+) ports<sup>1</sup></li> <li>• 4 x 10GbE iSCSI (SFP+) ports<sup>1</sup></li> <li>• 2 x 10GbE iSCSI (RJ45) ports</li> </ul>

	Built-in 2 x 10GBASE-T iSCSI (RJ45) ports Built-in 1 x 1GbE management port
<b>Expansion Connectivity (per Controller)</b>	Built-in 2 x 12Gb/s SAS wide ports (SFF-8643, internal) connectors (connect with the SAS cable by using mini-SAS HD SFF-8644 connector)
<b>Drive Type</b>	2.5" SAS, SED <sup>2</sup> SSD
<b>Expansion Capabilities</b>	Up to 4 expansion units using XD5326 (2U 26-bay, SFF) 12Gb SAS expansion enclosure
<b>Max. Drives Supported</b>	130
<b>Dimension (H x W x D)</b>	19" Rack mount 88 x 438 x 491 mm
<b>Memory Protection</b>	Cache-to-Flash module Battery backup module + Flash module
<b>LCM (LCD Module)</b>	USB LCM (optional)
<b>Power Supply</b>	80 PLUS Platinum, two redundant 770W (1+1) AC Input <ul style="list-style-type: none"> <li>• 100-127V 10A, 50-60Hz</li> <li>• 200-240V 5A, 50-60Hz</li> </ul> DC Output <ul style="list-style-type: none"> <li>• +12V 63.4A</li> <li>• +5VSB 2.0A</li> </ul>
<b>Fan Module</b>	2 x hot pluggable/redundant fan modules
<b>Temperature</b>	<ul style="list-style-type: none"> <li>• Operating temperature 0 to 40°C</li> <li>• Shipping temperature -10°C to 50°C</li> </ul>
<b>Relative Humidity</b>	<ul style="list-style-type: none"> <li>• Operating relative humidity 20% to 80% non-condensing</li> <li>• Non-operating relative humidity 10% to 90%</li> </ul>

<sup>1</sup> Slot 2 provides 20Gb bandwidth.

<sup>2</sup> SED drive support will be available in Q4 2018.

## 1.4. XCubeFAS Series Package Contents

Following list are the package contents for the XCubeFAS series models.











- System Chassis (x1)
- Disk Drive Trays
  - XF2026 (2U 26-bay, SFF): 2.5" Disk Drive Tray (x26)

- AC Power Cords (x2)
- RS-232 Console Cable (x2)
- Screws Pack for Disk Drives
- Cache-to-Flash module (BBM + Flash Module)
- Slide Rail
- Quick Installation Guide

## 1.5. XCubeFAS Series Optional Accessories

Following list are optional components for all XCubeFAS series models. If you want to purchase these optional components, please contact your nearest local reseller or visit QSAN official web site: <https://qsan.com/location>

Table 1-3 XCubeFAS Series Accessories

Model Name	Picture	Description	Applied Models
DIM-D44GB		DDR4 ECC 4GB Memory Module	XF2026 Series
DIM-D48GB		DDR4 ECC 8GB Memory Module	
DIM-D416GB		DDR4 ECC 16GB Memory Module	
DIM-D432GB		DDR4 ECC 32GB Memory Module	
C2F-BM128G		Cache-to-Flash Module : C2F-BBMD + C2F-FLHMD	
C2F-BBMD		Battery Backup Module for Cache-to-Flash	
C2F-FLHMD		Flash Module for Cache-to-Flash	
HQ-16F4S2		4-port 16Gb Fibre Channel Host Card (SFP+)	
HQ-16F2S2		2-port 16Gb Fibre Channel Host Card (SFP+)	
HQ-10G4S2		4-port 10GbE iSCSI Host Card (SFP+)	

HQ-10G2T		2-port 10GBASE-T iSCSI Host Card (RJ45)
GBC-SFP+16Gb-J		16G Fibre Channel SFP+ Optical Transceiver
GBC-SFP+10Gb-F		10GBASE-SR SFP+ Optical Transceiver
GBC-SFP+8Gb-F		8G Fibre Channel SFP+ Optical Transceiver
CBL-OPL500		Optical FC Cable, LC-LC, 5 Meters
CBL-OPL200		Optical FC Cable, LC-LC, 2 Meters
CBL-CNL		Console Cable, Phone-jack, 1 Meter
CBL-UPS		UPS Cable, Phone-jack, 1 Meter
CBL-12SW150		SAS 12G Expansion Cable with Wake-on-SAS, SFF-8644 to SFF-8644, 1.5 Meters (This cable is not suitable for connecting HBA or RAID card)
CBL-12SH150		SAS 12G Expansion Cable, SFF-8644 to SFF-8644, 1.5 Meters
LCM-U162		Portable USB LCM
SLR-RM3640		Slide Rail
HDT-251		2.5" Disk Drive Tray

## 2. System Components Overview

This chapter outlines the key hardware components or modules of the XCubeFAS system. After reading this chapter, you will have a basic understanding of each part of the XCubeFAS hardware and give you the ability to be able to successfully configure and operate your system. Following is the list of key components or modules of XCubeFAS:

- Front Panel
- System Disk Drive Numbering
- Supported SAS SSDs
- Rear Panel
- Power Unit
- Fan Module
- Cache-to-Flash Module

### 2.1. Front Panel

The XCubeFAS Series features a unique design: the system controls and indicators is located on the right ear. The system controls and indicators module integrates functional buttons and system state indicators, which can be easily operated and read by user. The figure below contains detailed information about the button and indicators module. For a greater understanding of the related colors and behaviors of each indicator on the front panel, please refer to the chapter 5.1, [Front Panel](#) section in the Descriptions of LEDs and Buttons chapter.

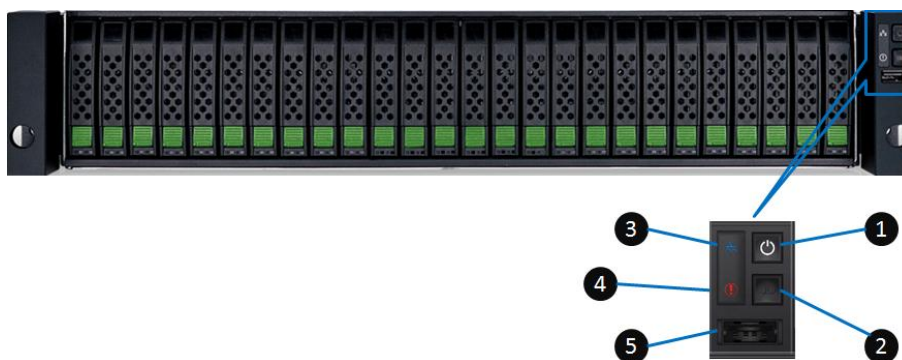


Figure 2-1 System Controls and Indicators

Table 2-1 Descriptions of System Controls and Indicators

Number	Description
1	System Power Button/LED
2	UID (Unique Identifier) Button/LED
3	System Access LED
4	System Status LED
5	USB Port (for USB LCM module)

Figures and the table below illustrate SFF system front panel components.

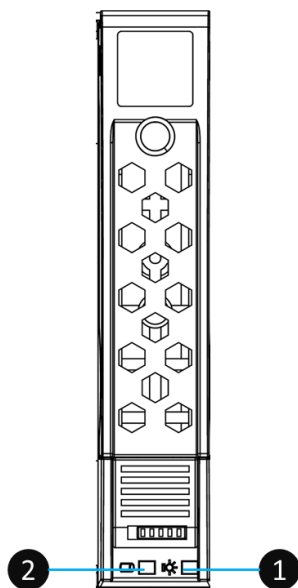


Figure 2-2 SFF System Front Panel Components

Table 2-2 SFF System Front Panel Components

Number	Description
1	System Left Ear
2	Disk Drive Tray
3	System Right Ear
4	The System Controls and Indicators

- Disk Drive Tray Indicators: figures and the table below illustrate SFF disk drive tray indicators.



SFF Disk Drive Tray

Figure 2-3 Disk Drive Indicators of SFF Disk Drive Tray

Table 2-3 Disk Drive Indicators of SFF Disk Drive Tray

Number	Description
1	Disk Drive Power LED
2	Disk Drive Status LED

For a greater understanding of the related color and the behavior of the disk drive, please refer to the chapter 5.1, [Front Panel](#) section in the Descriptions of LEDs and Buttons chapter.

## 2.2. System Disk Drive Numbering

Figures below illustrate the XCubeFAS system disk drive numbering. The SFF system disk drive numbering is single row from left to right. If you want to check the disk drive numbering rule while installing the disk drives into the system, for SFF system, the disk drive numbering is printed on the lower part of the system front.



Figure 2-4 System Disk Drive Numbering for the XCubeFAS Series



**TIP:**

Please plug-in any of the first four hard drives, then event logs can be saved and displayed in next system boot up. Otherwise, the event logs cannot be saved.

## 2.3. Supported SAS SSDs

The table below shows supported SAS SSDs for all XCubeFAS series models. This can be a reference for you to purchase suitable SSDs for your system.

QSAN has qualified the popular SAS SSDs available in the market; to ensure that you have the highest level of flexibility in choosing the most advanced SSDs available from the manufacturers or purchase the best cost/performance SAS SSDs from the market, to suit your budget/performance. We hope that this will significantly reduce your IT infrastructure investment cost. If you want to check the compatible SSDs for your XCubeFAS system, please refer to the [Compatibility Matrix](#) table.

Table 2-4 Supported Disk Drive Types

Form Factor of Disk Drive Tray	Drive Type	Connection Interface
SFF 2.5"	SSD	SAS, NL-SAS, SED <sup>3</sup>

<sup>3</sup> SED drive support will be available in Q4 2018.

## 2.4. Rear Panel

The following content outlines the detail of the XCubeFAS series rear panel and components. In this section, you will learn the name and location of the key components and modules in the rear panel.

## 2.4.1. Rear Panel Layout

Figures and the table below illustrate the SFF system rear panel layout.

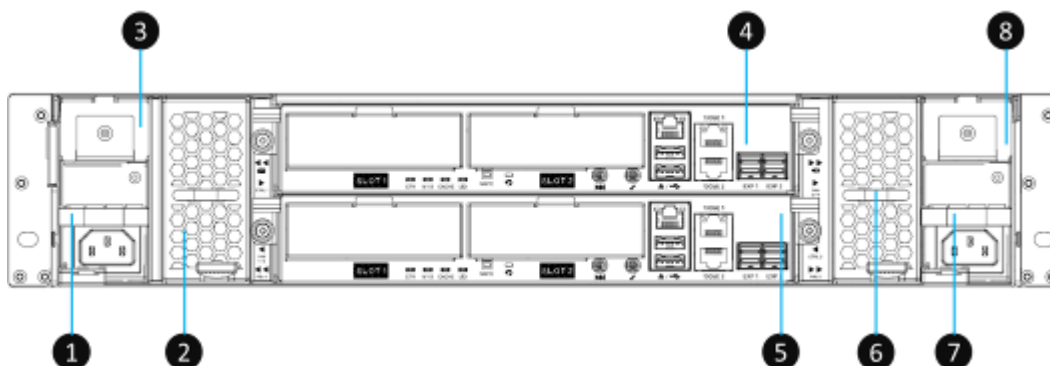


Figure 2-5 SFF Rear Panel Layout

Table 2-5 SFF Rear Panel Layout

Number	Description
1	Power Supply Unit 1
2	Fan Module 1
3	Slot for Cache-to-Flash Module: Flash Module
4	Controller Module 1
5	Controller Module 2
6	Fan Module 2
7	Power Supply Unit 2
8	Slot for Cache-to-Flash Module: Power Module

## 2.4.2. Controller Module

The following image and table illustrate each component of a controller module. In this section, you will learn the name and location of each port, LED and host cards (optional parts).

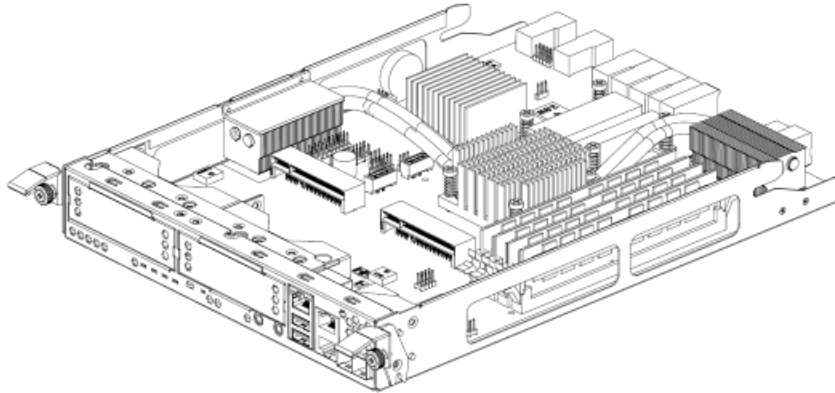


Figure 2-6 General View of the Controller Module

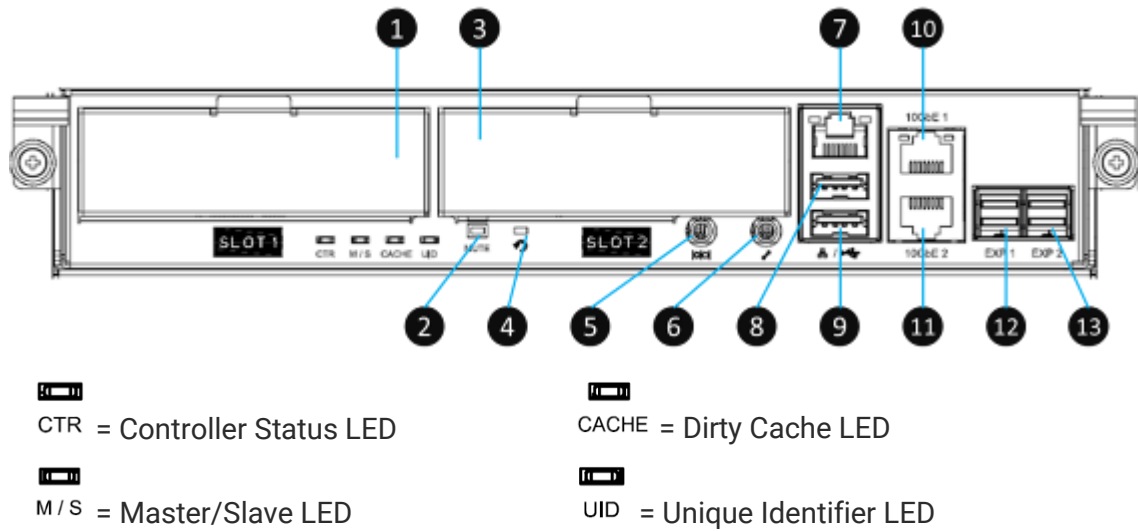


Figure 2-7 Components of the Controller Module

Table 2-6 Description of the Controller Module Components

Number	Description
1	Host Card Slot 1 (host card is an optional part)
2	Buzzer Mute Button
3	Host Card Slot 2 (host card is an optional part)
4	Reset to Factory Default Button <sup>4</sup>
5	Console Port (3.5mm jack to RS232) <sup>5</sup>
6	Service Port (UPS) <sup>6</sup>
7	Management Port
8	USB Port 1
9	USB Port 2
10	10GbE iSCSI (RJ45) Port 1

11	10GbE iSCSI (RJ45) Port 2
12	12Gb/s SAS Wide Port 1 (SFF8644)
13	12Gb/s SAS Wide Port 2 (SFF8644)

**INFORMATION:**

<sup>4</sup> Press the button for 3 seconds to progress reset to defaults and force a reboot. The default settings are:

- Reset **Management Port** IP address to DHCP, and then fix IP address: 169.254.1.234/16.
- Reset admin's **Password** to 1234.
- Reset **System Name** to model name plus the last 6 digits of serial number. For example: XF2026-123456.
- Reset IP addresses of all **iSCSI Ports** to 192.168.1.1, 192.168.2.1, ... etc.
- Reset link speed of all **Fibre Channel Ports** to Automatic.
- Clear all access control settings of the host connectivity.

<sup>5</sup> Console cable (NULL modem cable) to connect from console port of the storage system to a RS 232 port on the management PC. The console settings are on the following: Baud rate: 115,200, 8 data bit, no parity, 1 stop bit, and no flow control; terminal Type: vt100.

<sup>6</sup> XCubeFAS series supports traditional UPS via a serial port and network UPS via SNMP. If using the UPS with a serial port, connect the system to the UPS via the included cable for communication. (The cable plugs into the serial cable that comes with the UPS.) Then set up the shutdown values for when the power goes out.

For a greater understanding of the related color and the behavior of the controller module, please refer to the chapter 5.2, [Rear Panel](#) section in the Descriptions of LEDs and Buttons chapter.

## 2.5. Power Supply Unit

All XCubeFAS series models are equipped with two redundant and hot swappable PSUs (Power Supply Units). If you pull out the PSU from the system chassis, the sticker will be at right side. The images and the table below illustrate the location of PSU in the SFF system.

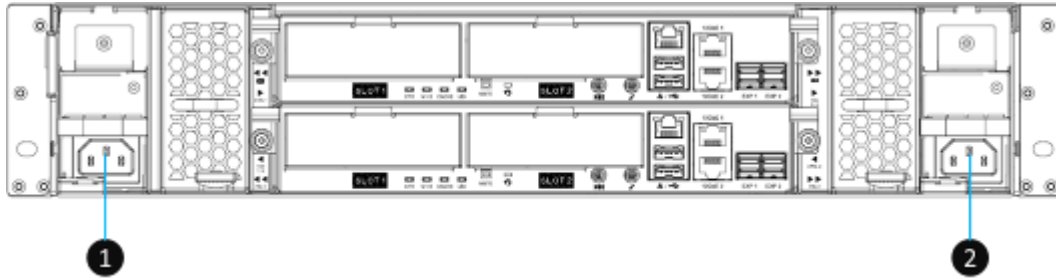


Figure 2-8 Location of the Power Supply Unit in the SFF System

Table 2-7 Location of the Power Supply Unit in the SFF System

Number	Description
1	PSU 1
2	PSU 2

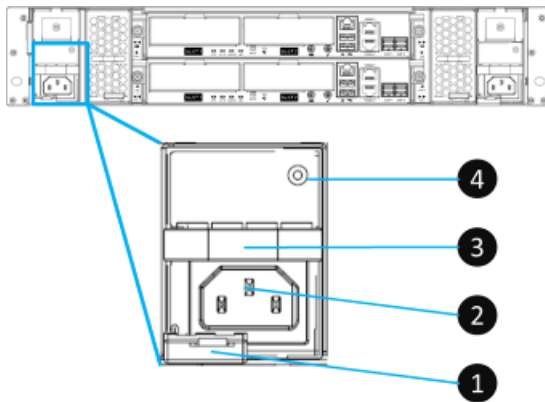


Figure 2-9 Components of the Power Supply Unit

Table 2-8 Components of the Power Supply Unit

Number	Description
1	PSU Release Tab
2	PSU Power Cord Connect
3	PSU Handle
4	PSU LED Indicator

If you want to learn more about the related color and behavior of the PSU LED, please refer to the chapter 5.2, [Rear Panel](#) section in the Descriptions of LEDs and Buttons chapter.

## 2.6. Fan Module

All XCubeFAS series models are equipped with two redundant and hot swappable fan modules. Each fan module includes two fans. Images and tables below illustrate the location and mechanical components of the fan module that is installed in the SFF system.

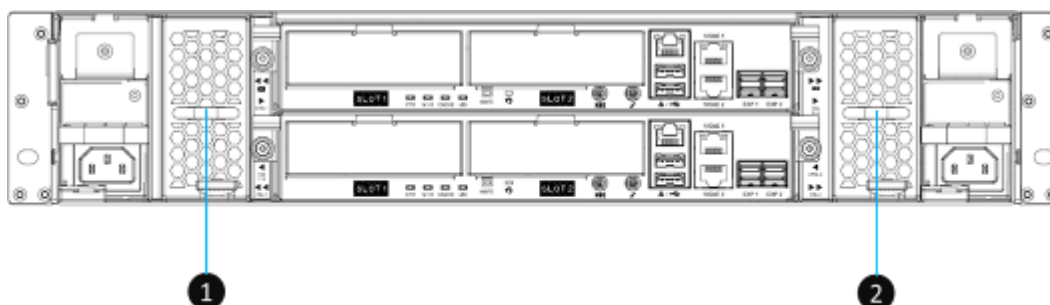


Figure 2-10 Location of Each Fan Module Installed in the SFF System

Table 2-9 Location of Each Fan Module Installed in the SFF System

Number	Description
1	Fan 1 and Fan 2
2	Fan 3 and Fan 4

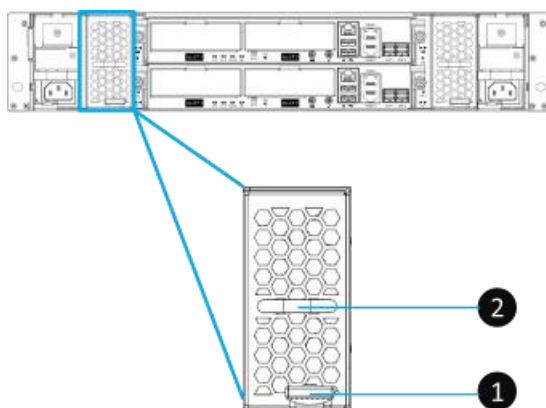


Figure 2-11 Mechanical Components of the Fan Module

Table 2-10 Mechanical Components of the Fan Module

Number	Description
1	Fan Module Release Tab
2	Fan Module Handle

## 2.7. Cache-to-Flash Memory Protection

In the event of power loss, the I/O cache data stored in the volatile memory will be lost; this can cause data inconsistency especially in database applications. The XCubeFAS series can provide an optional Cache-to-Flash memory protection function that will safely transfer the memory cache data to a non-volatile flash device for permanent preservation. The optional Cache-to-Flash module comes with an M.2 flash module and a BBM (Battery Backup Module).

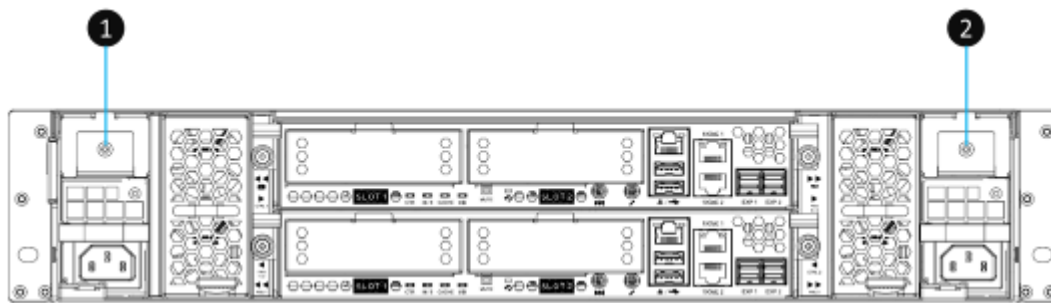


Figure 2-12 Location of the Cache-to-Flash Module

Table 2-11 Location of the Cache-to-Flash Module

Number	Description
1	Slot for Flash Module
2	Slot for Power Module



Figure 2-13 The Cache-to-flash Module – BBM (Battery Backup Module) Pack

### 2.7.1. Mechanism of Cache Data Protection

The following image is the working sequence of QSAN Cache-to-Flash workflow.

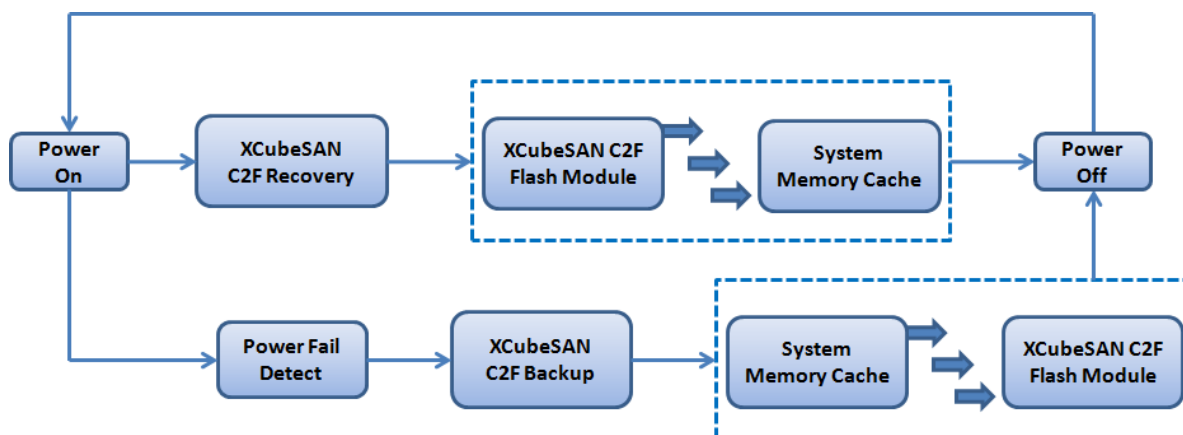


Figure 2-14 Cache-to-Flash Workflow

Cache-to-Flash technology will first flush CPU cache to memory RAM, then flush memory RAM to M.2 flash module to maintain the upmost data consistency. It leverages the strength of both BIOS and CPU to quickly backup memory RAM data to the flash module. In order to quickly move data from memory RAM to flash module, M.2 PCI-Express interface flash module is selected for better performance and less power consumption. In Cache-to-Flash recovery phase, BIOS will check C2F flag status. If C2F flag is ON, I/O cache data will be recovered from the M.2 flash module and then continue normal booting. If C2F flag is OFF, the normal booting process continues. Compared with traditional BBM solution of 72 hours standard, Cache-to-Flash technology is more efficient, less risky and consumes less power.

## 2.7.2. Features of the Cache-to-Flash Module

The optional Cache-to-Flash module comes with a M.2 flash module and a BBM. All modules are hot pluggable with zero system downtime for extra availability and reliability. M.2 flash module can be plugged in on the left hand side from the rear of the chassis. Power module can be plugged in on the right hand side from the rear of the chassis.

Table 2-12 Protection Memory Capacity

Device	Protection Memory Capacity
Battery Backup Module + Flash Module	Protect all memory capacity

## 3. Installing the System Hardware

This chapter will show you the detailed procedure of the XCubeFAS series hardware installation and initial configuration.

### 3.1. Installation Checklist

To ensure a successful system installation and initial configuration, you can follow the procedures in the checklist below by order.

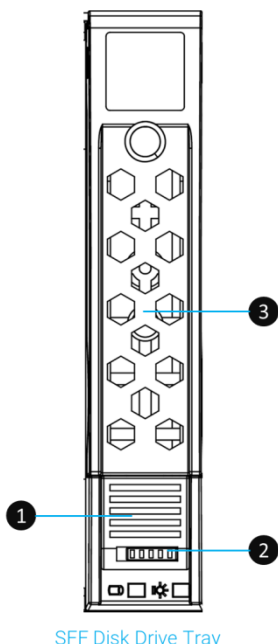
Table 3-1 Installation Checklist

Step	Task	Where to Find the Detail Procedure
1	Installing disk drives into the trays	<a href="#">Chapter 3.2</a>
2	Installing the optional host cards	<a href="#">Chapter 3.3</a>
3	Installing the optional memory modules	<a href="#">Chapter 3.4</a>
4	Installing the optional cache-to-flash modules	<a href="#">Chapter 3.5</a>
5	Installing the optional slide rails	<a href="#">Chapter 3.6</a>
6	Installing the trays into the system	<a href="#">Chapter 3.7</a>
7	Connecting the system to a host	<a href="#">Chapter 3.8</a>
8	Connecting power cords and powering on the system	<a href="#">Chapter 3.9</a>
9	Connecting a UPS	<a href="#">Chapter 3.12</a>
10	Connecting the optional USB LCM	<a href="#">Chapter 3.13</a>
11	Discover and carry out the initial configure for the system	<a href="#">Chapter 3.14</a>

### 3.2. Installing Disk Drives into the Trays

#### Key Components of the Disk Drive Tray

The following content illustrates the key components of SFF disk drive trays.



SFF Disk Drive Tray

Figure 3-1 Front Side Components of SFF Disk Drive Trays

Table 3-2 Front Side Components of SFF Disk Drive Trays

Item Number	Description
1	Carrier Handle Release Button
2	Release Button Lock
3	Carrier Handle

### Unlock the Disk Drive Tray and Remove from the System

The standard position of the disk drive tray is locked to prevent damage during transport. You must unlock disk drive trays before starting to install drives into the system chassis. The following content is the detailed steps for removing a disk drive tray from the system:

- Unlock release button lock: shift the lock from left to right.
- Procedure of opening the SFF disk drive tray carrier handle: shift the carrier handle release button from up to down; then carrier handle will automatically pop out.

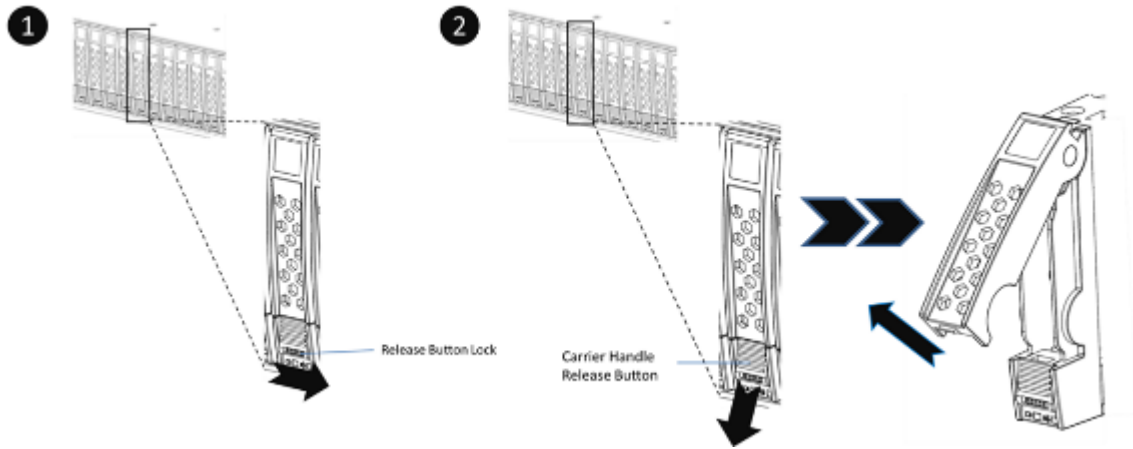


Figure 3-2 Unlock and Open the Carrier Handle of a Disk Drive Tray (SFF)

- The following content is the procedure for removing disk drive trays from the system:
  - Hold the carrier handle and pull the disk drive tray out until it is free of the disk drive bay.
  - Repeat steps above for another empty disk drive trays that you would like to remove.

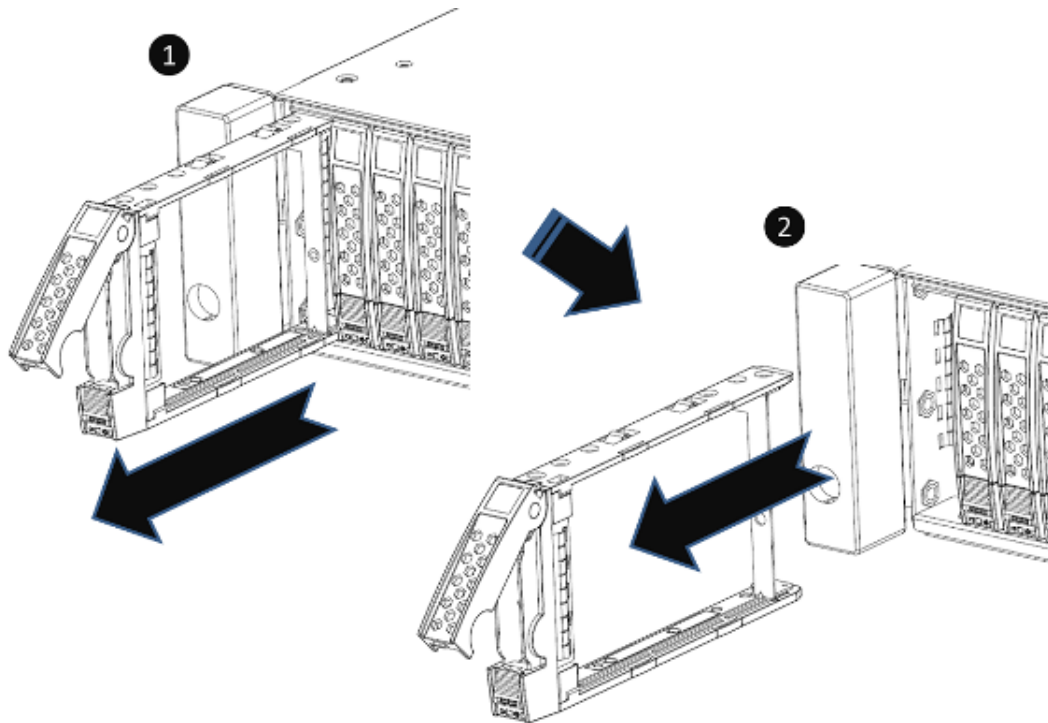


Figure 3-3 Hold the Carrier Handle and Pull out the Disk Drive Tray (SFF)

## Installing a Disk Drive into a Tray

Following contents and figures are detail steps of installing a disk drive into the tray.

- For installing an SFF disk drive into an SFF tray
  - Place a disk drive tray onto a stable surface.
  - Remove the supporting bracket. Then align the disk drive with the connector facing away from the carrier handle.
  - Align four disk drive tray screw holes on both sides of the disk tray.
  - Install and tighten all four screws to secure disk drive within the tray.

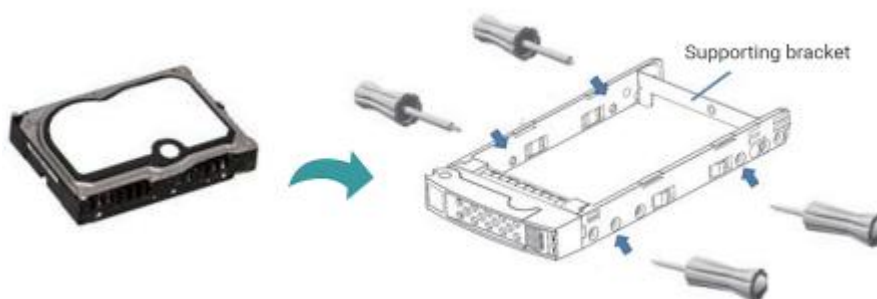


Figure 3-4 Align a Disk Drive & Install into a Tray (SFF-to-SFF)




### TIP:

Please plug-in any of the first four hard drives, then event logs can be saved and displayed in next system boot up. Otherwise, the event logs cannot be saved.

The table below shows the available disk drive trays and their descriptions.

Table 3-3 Available Disk Drive Trays for XCubeFAS Series





Model Name	Picture	Description	Applied Models
HDT-251		2.5" Disk Drive Tray	XF2026 Series

## 3.3. Installing the Optional Host Cards

The XCubeFAS series comes with two on-board 10GbE iSCSI ports on each controller. If you want to expand the number of host ports, purchase QSAN host cards (optional components) will be the fastest and most cost-efficiency choice.

There are several types of host cards that are available for selection. You can configure a Fibre Channel SAN by using QSAN 16Gb Fibre Channel host cards; you can choose a iSCSI SAN by using 10GbE via SFP+ or 10GBASE-T host cards. The table below shows the available host card types, model names, and their descriptions.

Table 3-4 Available Host Cards for XCubeFAS Series

Model Name	Picture	Description	Applied Models
HQ-16F4S2		4-port 16Gb Fibre Channel Host Card (SFP+)	XF2026 Series
HQ-16F2S2		2-port 16Gb Fibre Channel Host Card (SFP+)	
HQ-10G4S2		4-port 10GbE iSCSI Host Card (SFP+)	
HQ-10G2T		2-port 10GBASE-T iSCSI Host Card (RJ45)	



### CAUTION:

You must remove the controller module from the system chassis before starting the host card installing procedures.

Host card can NOT hot plug in the controller module. Hot plug in the host card might cause system hang up. You should remove the controller module from the system chassis before installing / removing host card. Please DO NOT attempt to hot plug in the host card.

Following figure is the overview of the host card installation slots.

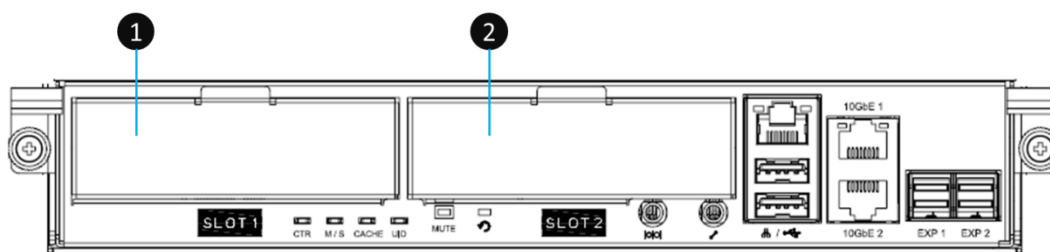


Figure 3-5 Host Card Installation Slots

Table 3-5 Host Card Installation Slots of a Controller

Item Number	Description
1	Host Card Slot 1
2	Host Card Slot 2

Please refer to following tables for supported installing location and combination of host cards to keep the optimized system performance and prevent any unexpected incidents.

Table 3-6 Supported Installing Location and Combination of the Host Cards

Connection Type	Model Type	Controller Number	Slot 1	Slot 2
FC SAN 16Gb FC (SFP+)	Single Controller	CTRL 1	HQ-16F4S2	N/A
		N/A		
	Single Controller	CTRL 1	HQ-16F4S2	HQ-16F4S2 <sup>9</sup>
		N/A		
	Single Controller	CTRL 1	HQ-16F4S2	HQ-16F2S2 <sup>9</sup>
		N/A		
	Single Controller	CTRL 1	HQ-16F2S2	N/A
		N/A		
	Single Controller	CTRL 1	HQ-16F2S2	HQ-16F2S2 <sup>9</sup>
		N/A		
	Dual Controller	CTRL 1	HQ-16F4S2	N/A
		CTRL 2	HQ-16F4S2	N/A
	Dual Controller	CTRL 1	HQ-16F4S2	HQ-16F4S2 <sup>9</sup>
		CTRL 2	HQ-16F4S2	HQ-16F4S2 <sup>9</sup>
	Dual Controller	CTRL 1	HQ-16F4S2	HQ-16F2S2 <sup>9</sup>
		CTRL 2	HQ-16F4S2	HQ-16F2S2 <sup>9</sup>

	Dual Controller	CTRL 1	HQ-16F2S2	N/A
		CTRL 2	HQ-16F2S2	N/A
	Dual Controller	CTRL 1	HQ-16F2S2	HQ-16F2S2 <sup>9</sup>
		CTRL 2	HQ-16F2S2	HQ-16F2S2 <sup>9</sup>
<b>iSCSI SAN</b> 10GbE (SFP+)	Single Controller	CTRL 1	HQ-10G4S2	N/A
		N/A		
	Single Controller	CTRL 1	HQ-10G4S2	HQ-10G4S2 <sup>9</sup>
		N/A		
	Dual Controller	CTRL 1	HQ-10G4S2	N/A
		CTRL 2	HQ-10G4S2	N/A
	Dual Controller	CTRL 1	HQ-10G4S2	HQ-10G4S2 <sup>9</sup>
		CTRL 2	HQ-10G4S2	HQ-10G4S2 <sup>9</sup>
<b>iSCSI SAN</b> 10GBASE-T (RJ45)	Single Controller	CTRL 1	HQ-10G2T	N/A
		N/A		
	Single Controller	CTRL 1	HQ-10G2T	HQ-10G2T
		N/A		
	Dual Controller	CTRL 1	HQ-10G2T	N/A
		CTRL 2	HQ-10G2T	N/A
	Dual Controller	CTRL 1	HQ-10G2T	HQ-10G2T
		CTRL 2	HQ-10G2T	HQ-10G2T
<b>iSCSI SAN</b> 1GBASE-T (RJ45)	Single Controller	CTRL 1	HQ-01G4T	N/A
		N/A		
	Single Controller	CTRL 1	HQ-01G4T	HQ-01G4T
		N/A		
	Dual Controller	CTRL 1	HQ-01G4T	N/A
		CTRL 2	HQ-01G4T	N/A
	Dual Controller	CTRL 1	HQ-01G4T	HQ-01G4T
		CTRL 2	HQ-01G4T	HQ-01G4T
<b>iSCSI SAN</b> 10GbE (SFP+) + 10GBASE-T (RJ45)	Single Controller	CTRL 1	HQ-10G4S2	HQ-10G2T
		N/A		
	Dual Controller	CTRL 1	HQ-10G4S2	HQ-10G2T
		CTRL 2	HQ-10G4S2	HQ-10G2T
<b>iSCSI SAN</b> 10GbE (SFP+) + 1GBASE-T (RJ45)	Single Controller	CTRL 1	HQ-10G4S2	HQ-01G4T
		N/A		
	Dual Controller	CTRL 1	HQ-10G4S2	HQ-01G4T
		CTRL 2	HQ-10G4S2	HQ-01G4T

<b>iSCSI SAN</b> 10GBASE-T (RJ45) + 1GBASE-T (RJ45)	Single Controller	CTRL 1	HQ-10G2T	HQ-01G4T
		N/A		
	Dual Controller	CTRL 1	HQ-10G2T	HQ-01G4T
		CTRL 2	HQ-10G2T	HQ-01G4T
<b>Mix SAN</b> 16Gb FC (SFP+) + 10GbE (SFP+)	Single Controller	CTRL 1	HQ-16F4S2	HQ-10G4S2 <sup>9</sup>
		N/A		
	Dual Controller	CTRL 1	HQ-16F4S2	HQ-10G4S2 <sup>9</sup>
		CTRL 2	HQ-16F4S2	HQ-10G4S2 <sup>9</sup>
<b>Mix SAN</b> 10GbE (SFP+) + 16Gb FC (SFP+)	Single Controller	CTRL 1	HQ-10G4S2	HQ-16F2S2 <sup>9</sup>
		N/A		
	Dual Controller	CTRL 1	HQ-10G4S2	HQ-16F2S2 <sup>9</sup>
		CTRL 2	HQ-10G4S2	HQ-16F2S2 <sup>9</sup>
<b>Mix SAN</b> 16Gb FC (SFP+) + 10GBASE-T (RJ45)	Single Controller	CTRL 1	HQ-16F4S2	HQ-10G2T
		N/A		
	Single Controller	CTRL 1	HQ-16F2S2	HQ-10G2T
		N/A		
	Dual Controller	CTRL 1	HQ-16F4S2	HQ-10G2T
		CTRL 2	HQ-16F4S2	HQ-10G2T
	Dual Controller	CTRL 1	HQ-16F2S2	HQ-10G2T
		CTRL 2	HQ-16F2S2	HQ-10G2T
<b>Mix SAN</b> 16Gb FC (SFP+) + 1GBASE-T (RJ45)	Single Controller	CTRL 1	HQ-16F4S2	HQ-01G4T
		N/A		
	Single Controller	CTRL 1	HQ-16F2S2	HQ-01G4T
		N/A		
	Dual Controller	CTRL 1	HQ-16F4S2	HQ-01G4T
		CTRL 2	HQ-16F4S2	HQ-01G4T
	Dual Controller	CTRL 1	HQ-16F2S2	HQ-01G4T
		CTRL 2	HQ-16F2S2	HQ-01G4T

<sup>9</sup> Slot 2 provides 20Gb bandwidth.



## CAUTION:

If you change the host card type in the same slot, the system needs to be reset to factory default to make the host card change effective. If you want to learn more about how to reset your system to factory, please refer to the chapter 6.5.5, Rest to Factory Default section in the [XCubeFAS XEVO 1.0 User's Manual](#).

All dual controller XCubeFAS series models must have installed the same type of host cards into the same slot number to keep the optimized system performance.



## INFORMATION:

Due to the total bandwidth of slot 2 is 20Gb. It CAN NOT satisfy four ports of 10GbE iSCSI with full speed, we strongly recommend combining two ports by enabling link aggregation for failover. Such as combining port 1 and port 2 as LAG (Link Aggregation Group) 1, port 3 and port4 as LAG 2. If you want to learn more about how to setup link aggregation, please refer to the chapter 7.3.1, Configure iSCSI Ports section in the [XCubeFAS XEVO 1.0 User's Manual](#).

## Procedures of the Host Card Installation

The following content and images are detailed steps for installing a host card into the system.

- Remove the controller from the system chassis.

The following image and table are the introduction of the mechanical components of a controller module.

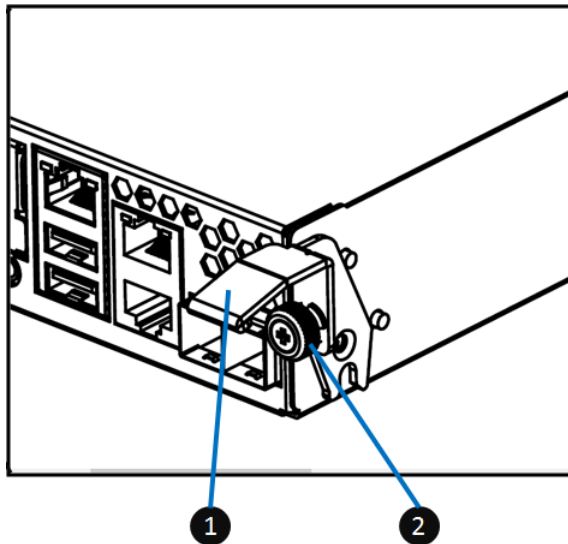


Figure 3-6 Mechanical Components of the Controller Module

Table 3-7 Mechanical Components of a Controller Module

Number	Description
1	Release Lever
2	Screw

- The following content and images are detailed steps for removing the controller module from the system chassis.
- Use a Phillips screwdriver to loosen the thumb screws on each release levers.
- Pull down both levers at the same time and then pull out about half length of the controller module by holding two release levers.
- Use one hand to hold one end of the controller module (the side with release levers) and the other hand hold the bottom of the controller; pull out the controller module until it is free from the system chassis.

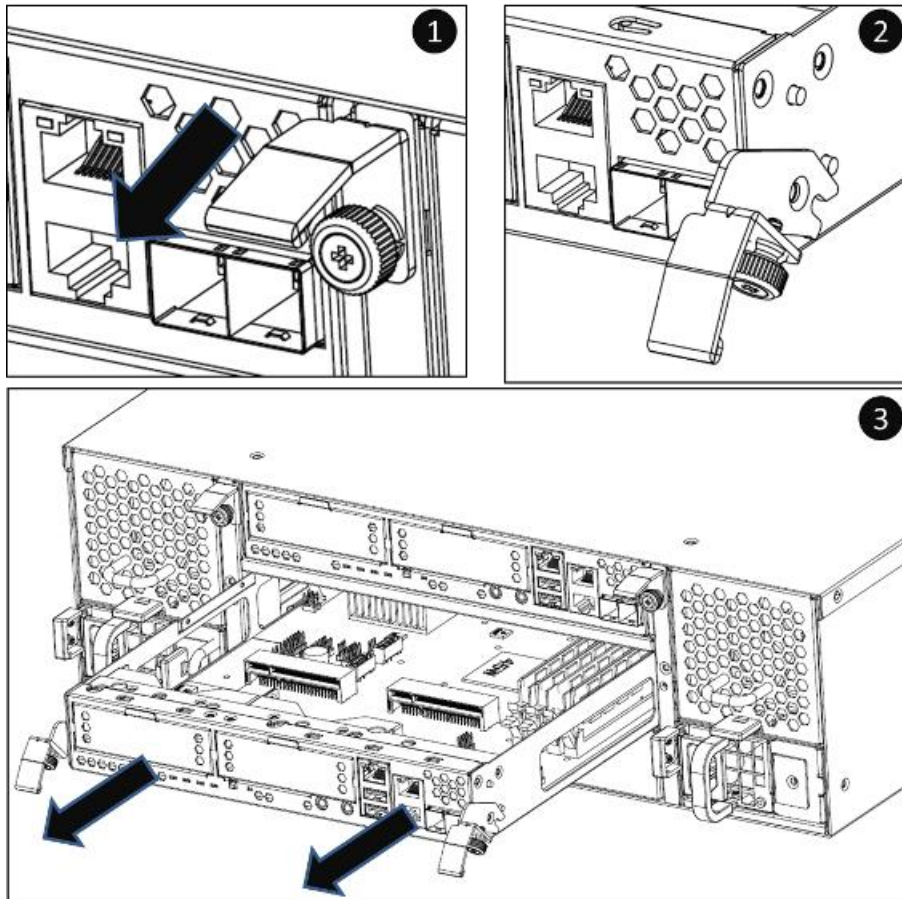


Figure 3-7 Steps of Removing the Controller Module

- Remove the dummy host card cage by loosening two screws of the dummy host card cage and then take dummy host card cage from controller module.

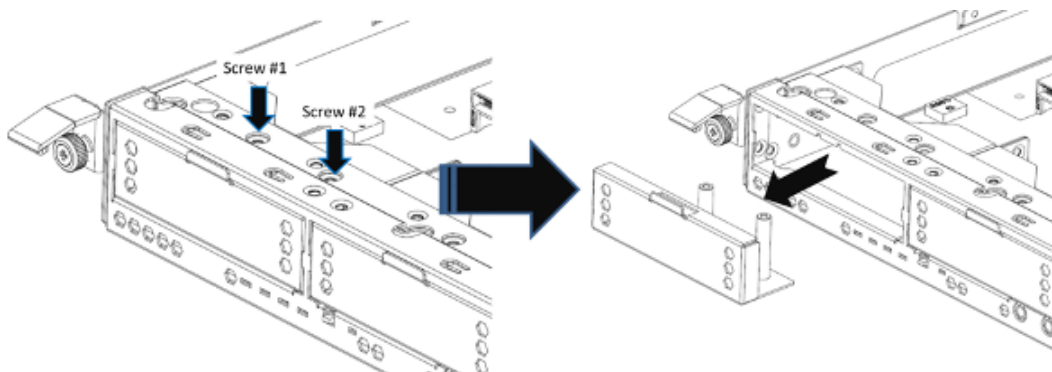
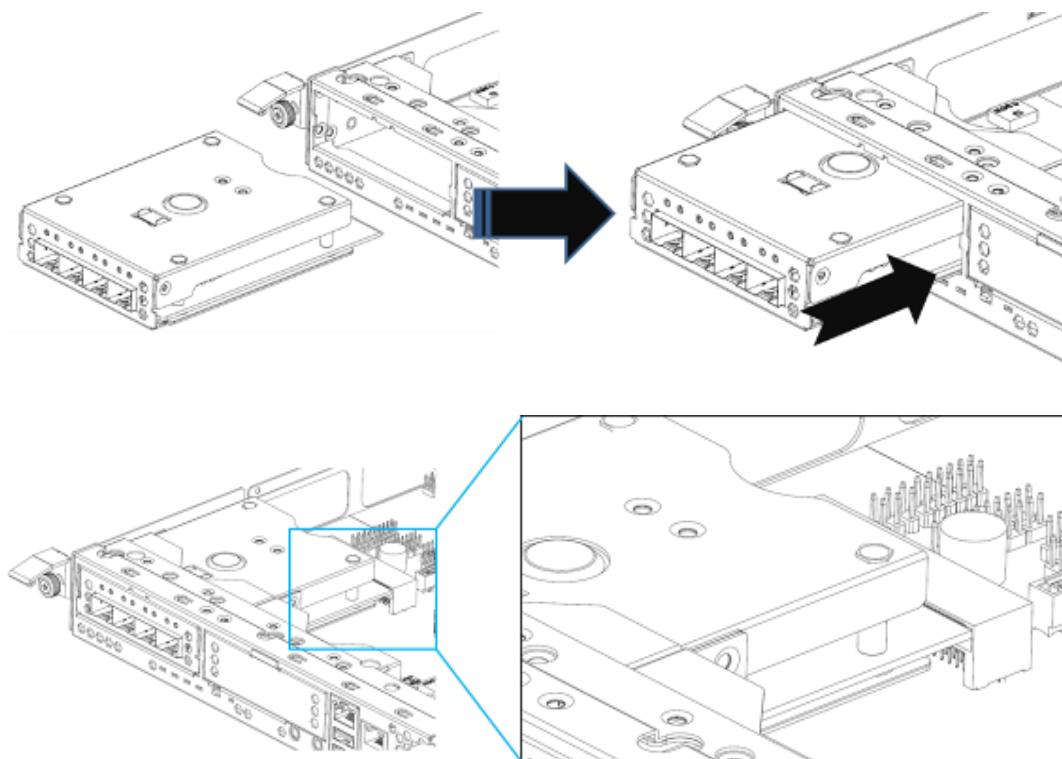


Figure 3-8 Procedures of Removing the Host Card Dummy Cage

- Align the host card to the slot to be installed and then push all the way into the controller cage until hear a “click” sound and make sure the host card is well connected with the connector in the controller module.



*Figure 3-9 Procedures of Installing the Host Card*

- Repeat procedures above if there are other host adapter cards need to be installed.
- You must install GBIC (s) for the Fibre Channel or 10GbE host cards before connecting the cables from the storage system to the host sides.
- Install the controller module into the system chassis if the host card installation completed.

### **Confirm the Host Card Installation**

If the host card is installed properly, you can check the host card connections status in XEON UI -> **System** -> **Data Ports**. If your host cards are properly installed, the status column will show the connection speed.

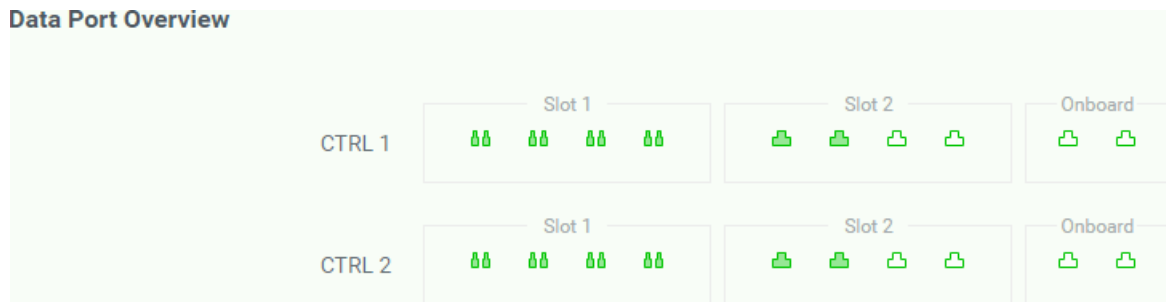


Figure 3-10 Connection and Status of the Host Cards

## 3.4. Installing the Optional Memory Modules

Standard system memory capacity for XCubeFAS series models: 32GB DDR4 for XF2026. If you purchase additional optional memory module for your storage system, please refer to the following image and table for the suggested sequence of memory module installation. It is requested that the installation slot and capacity of the memory module MUST be exactly the same for both controller.

The table below shows the available memory modules and their descriptions.

Table 3-8 Memory Modules for XCubeFAS Series

Model Name	Picture	Description	Applied Models
DIM-D44GB		DDR4 ECC 4GB Memory Module	XF2026 Series
DIM-D48GB		DDR4 ECC 8GB Memory Module	
DIM-D416GB		DDR4 ECC 16GB Memory Module	
DIM-D432GB		DDR4 ECC 32GB Memory Module	

In XF2026, there are four DIMM slots for expansion of memory capacity. The installation sequence for the memory module with the same capacity should be: #3 → #2 → #4 due to slot #1 and #2 are memory bank 1; slot #3 and #4 are bank 2. Balance the memory size of two banks will keep the optimized system performance. The installation sequence is applicable for dual or single controller module.

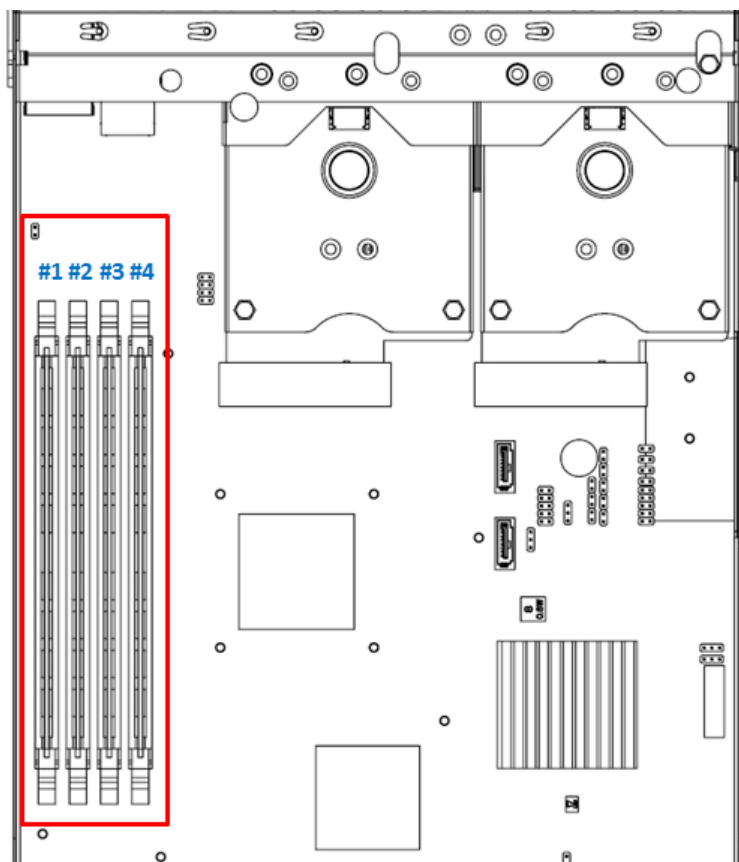


Figure 3-11 The Installation Sequence of the Memory Module in XF2026

The following table is the suggested installation sequence for optional memory module.

Table 3-9 The Installation Sequence for Optional Memory Module in XF2026

Bank 1		Bank 2		Total Memory
Slot #1	Slot #2	Slot #3	Slot #4	
16GB	-	16GB	-	32GB
16GB	4GB	16GB	4GB	40GB
16GB	8GB	16GB	8GB	48GB
16GB	16GB	16GB	16GB	64GB
32GB	-	32GB	-	64GB
32GB	32GB	32GB	32GB	128GB



## CAUTION:

To ensure the system stability, you MUST install genuine QSAN memory modules for system memory size expansion. In addition, the DIMM type of 32GB is RDIMM, and the others are UDIMM. The platform does not support mixing of DIMM, so there are not allowed the combinations of mixing 32GB.



## TIP:

Insert two DIMMs or more will boost performance.




## 3.5. Installing the Optional Cache-to-Flash Modules

The Cache-to-Flash module is a combination of a flash memory and a power module for write-back data protection in the event of a sudden and unexpected power loss. The table below is the available Cache-to-Flash module list. If you want to purchase cache-to-flash module, please contact your nearest local reseller or visit QSAN official web site:

<https://qsan.com/location>

The table below shows the available cache-to-flash modules and their descriptions.

Table 3-10 Available Cache-to-flash Modules for XCubeFAS Series

Model Name	Picture	Description	Applied Models
C2F-BM128G		Cache-to-Flash Module : C2F-BBMD + C2F-FLHMD	XF2026 Series
C2F-BBMD		Battery Backup Module for Cache-to-Flash	
C2F-FLHMD		Flash Module for Cache-to- Flash	



**CAUTION:**

The flash module of Cache-to-Flash is hot swappable because it is a PCIe device. Before removing the flash module from the system chassis, you must press the attention button until the flash module status LED finished blinking. Otherwise, the flash module maybe damage. For more information about Cache-to-Flash modules, please refer to the chapter 5.2.4, [Cache-to-Flash Module LEDs and Button](#) section and the chapter 6.5, [Removing the Cache-to-Flash Modules](#) section.

## Installing Cache-to-Flash Modules

The following content and images are steps for installing cache-to-flash modules.

- Install locations for the cache-to-flash modules

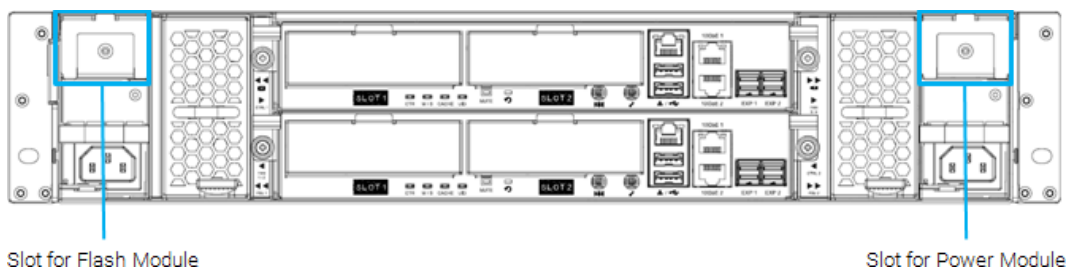


Figure 3-12 Location of the Cache-to-Flash Module

- Components of the cache-to-flash modules

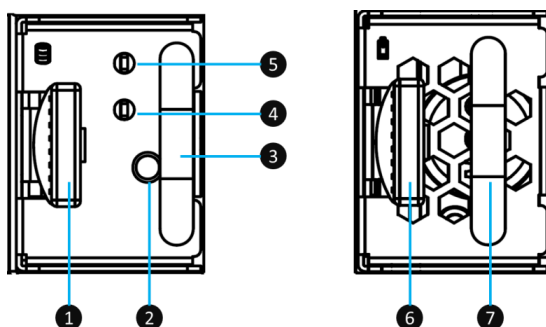


Figure 3-13 Components of the Cache-to-Flash Modules

Table 3-11 Components of the Cache-to-Flash Modules

Item	Number	Description
Flash Module	1	Flash Module Release Tab
	2	Flash Module Attention Button
	3	Flash Module Handle
	4	Flash Module Status LED
	5	Flash Module Power LED
Power Module	6	Power Module Release Tab
	7	Power Module Handle

- Remove the dummy cache-to-flash cage by losing the screw on it and then remove the dummy cage from the system chassis. Follow the same procedure for both sides.

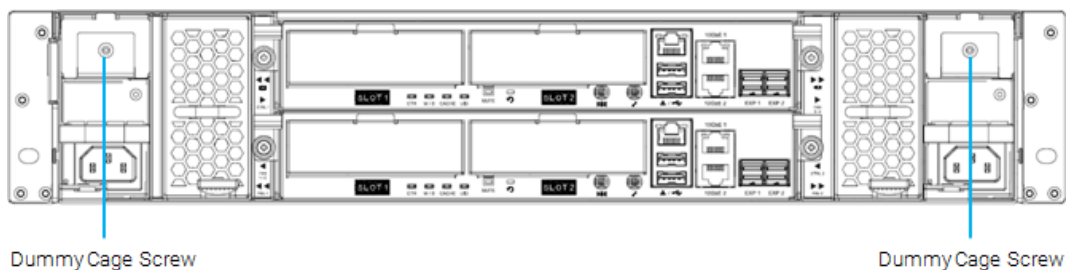


Figure 3-14 The Dummy Cage Screw Location of the Cache-to-Flash Module

- Align the flash module cage to the slot and then push it all the way into the system chassis until hear a “click” sound (for 2U chassis release tabs of both flash and power modules are facing upward while installing into the system).
- Align the power module cage to the slot and then push it all the way into the system chassis until hear a “click” sound.

## Confirm the Cache-to-Flash Module Installation

After the cache-to-flash modules are installed, you can check the status and information about cache-to-flash module in the XEVO UI -> **System** -> **Arrays**. If the flash module and power module are properly installed, the status will display **Good**.

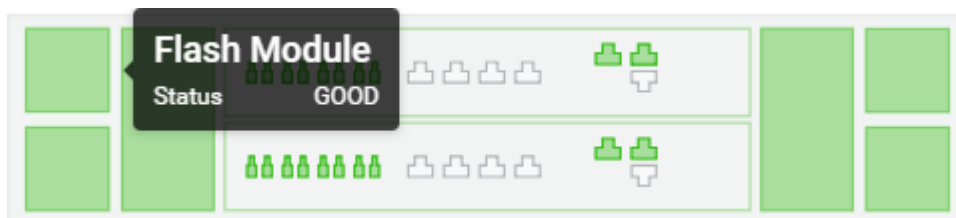



Figure 3-15 Status and Information of Cache-to-Flash Module

## 3.6. Installing the Optional Slide Rails

If you did not purchase QSAN qualified slide rails, please skip this section. The table below shows the available slide rail, model name, and its description.

Table 3-12 Available Slide Rails for XCubeFAS Series

Model Name	Picture	Description	Applied Models
SLR-RM3640		Slide Rail	XF2026 Series



### CAUTION:

The populated XCubeFAS system can be very heavy, to avoid any potential injury or harm to installers, or damage to the system, we strongly recommend at least two certified operators or engineers perform the system installation.



### TIP:

Install the disk drive trays into the system after the system chassis is mounted in the rack. Doing this can reduce the loading of the overall weight when you mount the system chassis in the rack.

#### 1. First step of the slide rails installation

- Take the slide rails from the carton.
- Pull the inner rail out and slide the intermediate rail back.

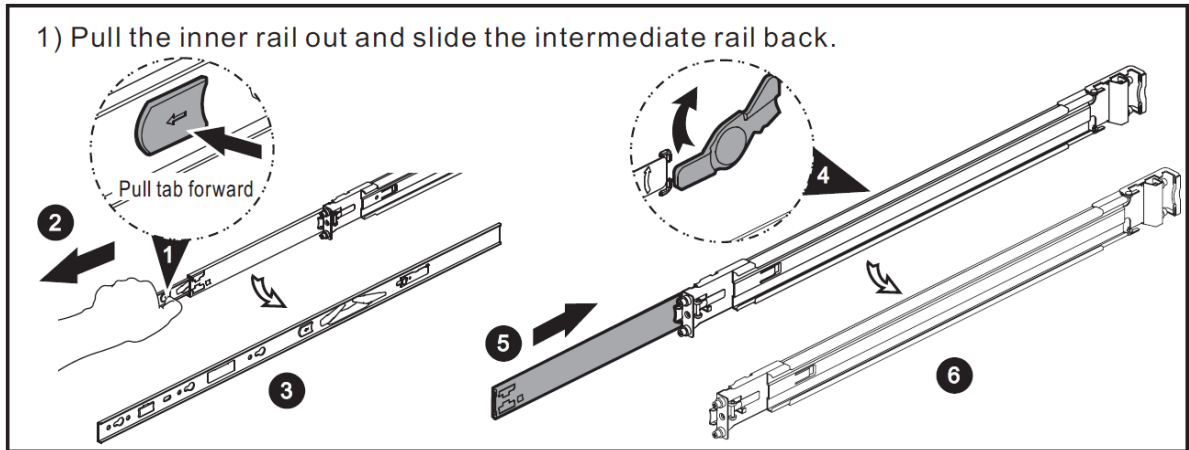


Figure 3-16 First Step of the Slide Rails Installation

## 2. Second step of the slide rails installation

- Install the inner member onto the chassis.

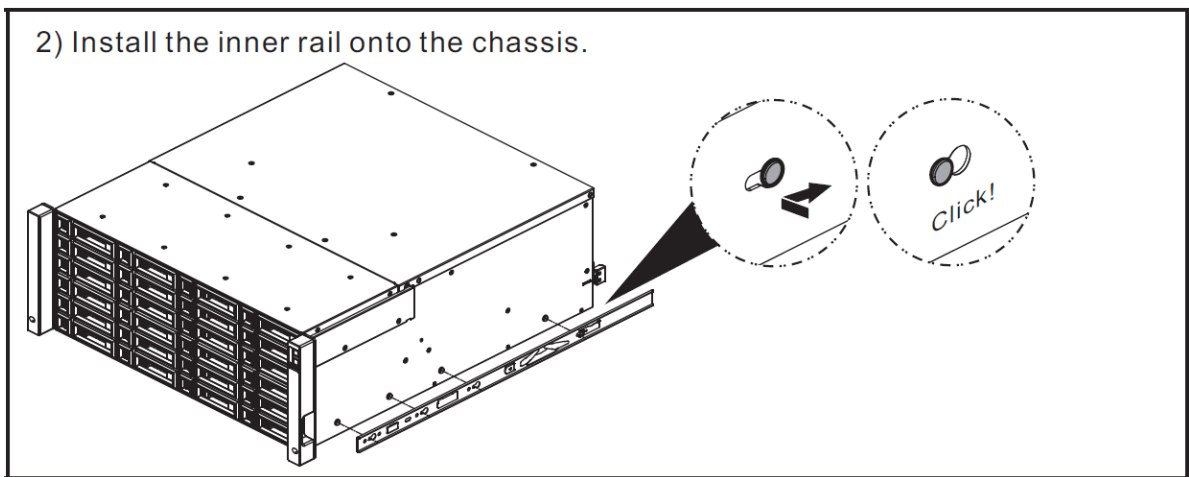


Figure 3-17 Second Step of the Slide Sails Installation

## 3. Third step of the slide rails installation

- Install the outer rail/bracket assembly to the frame.
- Repeat this installation step for the other side.

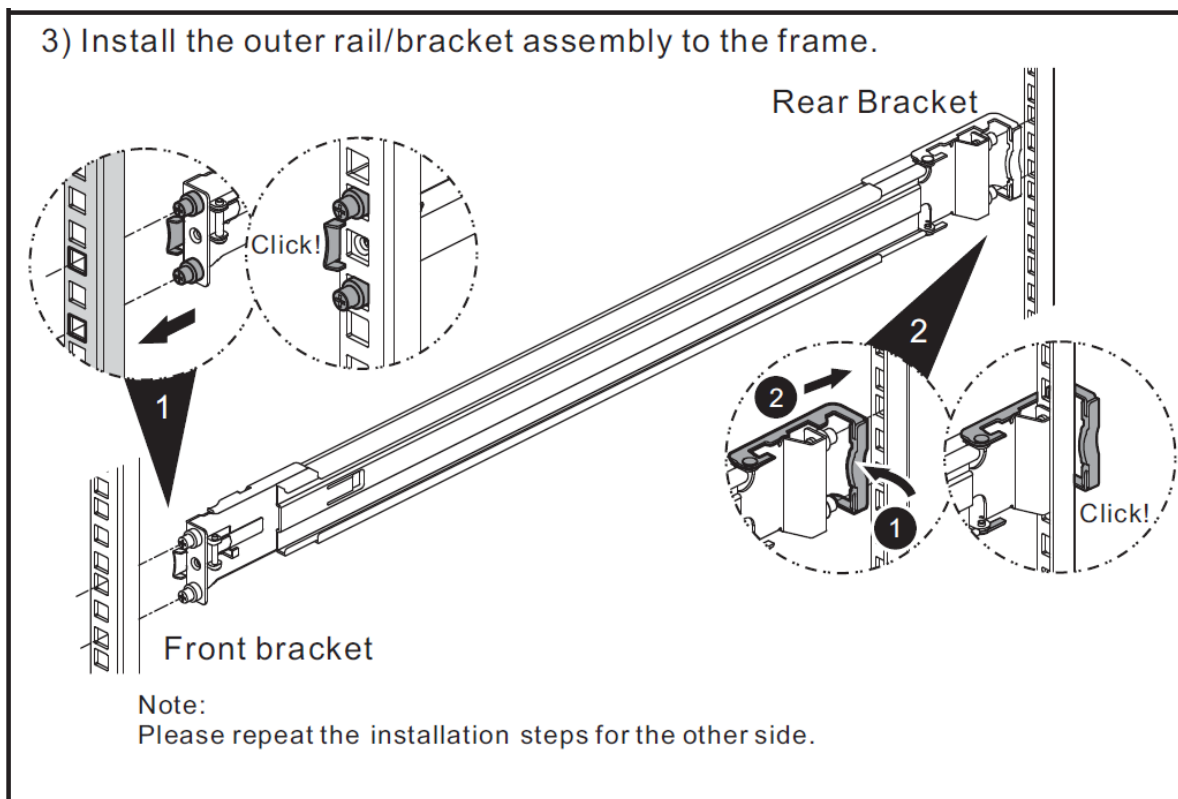


Figure 3-18 Third Step of the Slide Rails Installation

#### 4. Fourth step of the slide rails installation

- Pull the middle member fully extended in locked position.
- Ensure ball bearing retainer is located at the front of the middle member.
- Insert chassis into middle-outer member.
- When hitting the stop, pull/push release tab to unlock and retract chassis into rack.
- Use M5x20 screws to fasten the chassis ear.

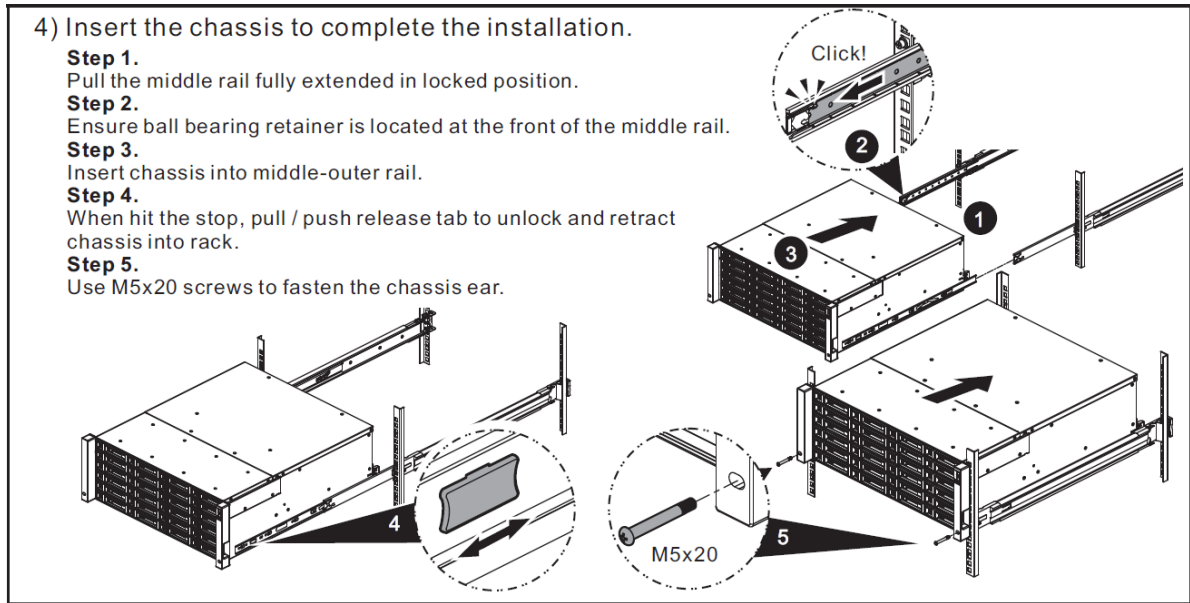


Figure 3-19 Fourth Step of the Slide Rails Installation

## 3.7. Installing the Trays into the System

Before installing, please check if the carrier handle is at the open position. The following procedure is for installing a tray into SFF systems.

The following content and images are detailed steps for installing a tray into the system.

- Align a disk drive with the tray to the empty bay you would like to install and then push it all the way into the disk drive bay until the carrier handle is at closed position.
- Lock the release button lock by pushing the lock from right to left.
- Refer to the label on the system chassis for disk drive numbering. (Disk drive numberings of 2U 26-bay are printed on the chassis.)

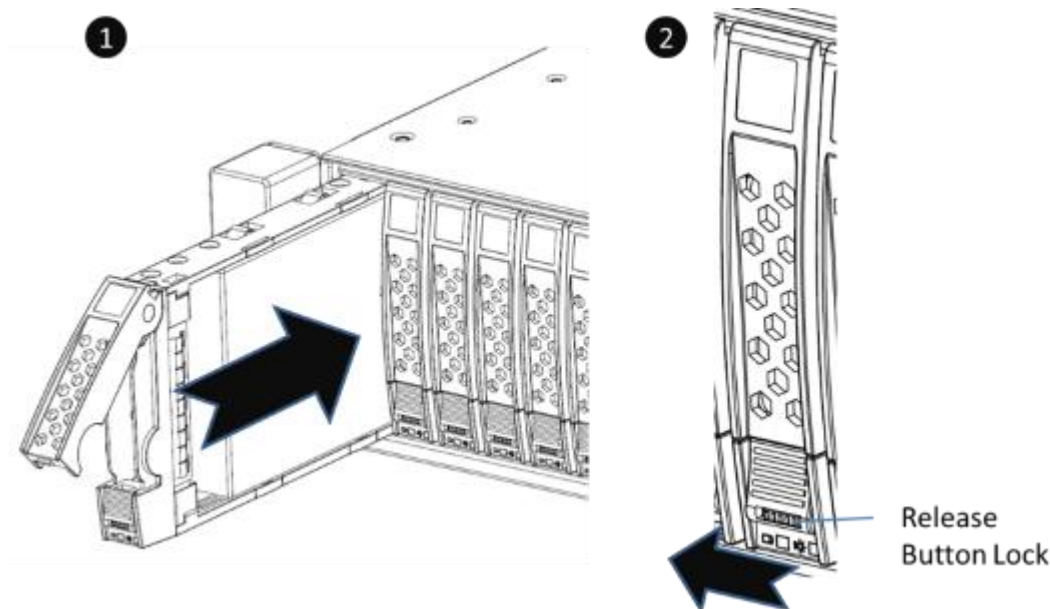


Figure 3-20 Install a Tray into the System and Lock the Release Button Lock (SFF)

## 3.8. Connecting the System to a Host

The XCubeFAS series products are equipped with two on-board 10GbE iSCSI (RJ45) ports per controller for data host connections and dual SAS3 expansion ports for expansion by adding up to nine XCubeDAS series enclosures. To learn more about advanced types of cabling, please refer to the chapter 4, [Deployment Types and Cabling](#).

### 3.8.1. Connecting to the Management Ports

XCubeFAS series models are equipped with one 1Gb BASE-T (RJ45) management port onboard per controller to allow access to the web based XEVO management system. The following image is the example of the cabling for the XCubeFAS management ports.

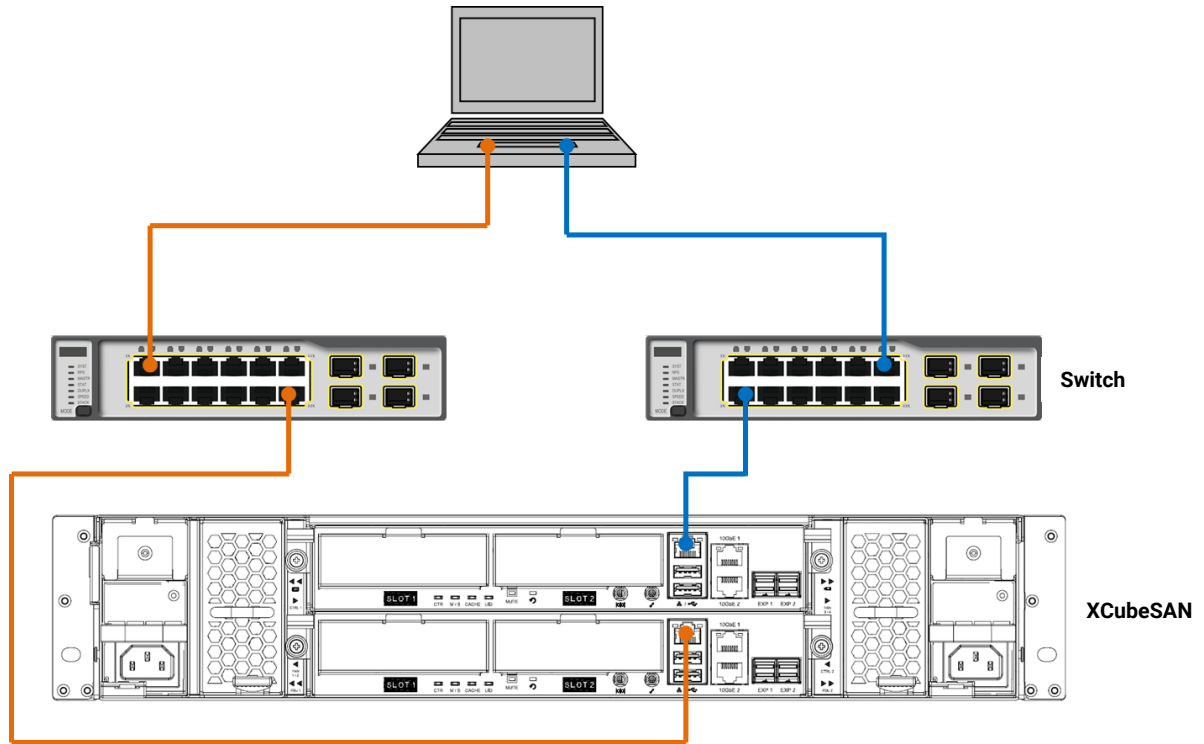


Figure 3-21 Cabling Example of the Administrator to the XCubeFAS Management Port

## 3.8.2. Dual Path (MPIO) Deployment

The following images illustrate some examples of deployment types for dual controller XCubeFAS series. MPIO (MultiPath I/O) configurations are designed to provide HA (High Availability) data connections to ensure data consistency in the rare event of a failure in the host connectivity from a single path.

### One Server / One HBA / Two Switches / One XCubeFAS / Dual Path

The following figure shows an example of a dual controller, connect enclosure configuration with one server accessing the storage via switches. One server is connected to a dual controller XCubeFAS series using CAT 6 network cables.

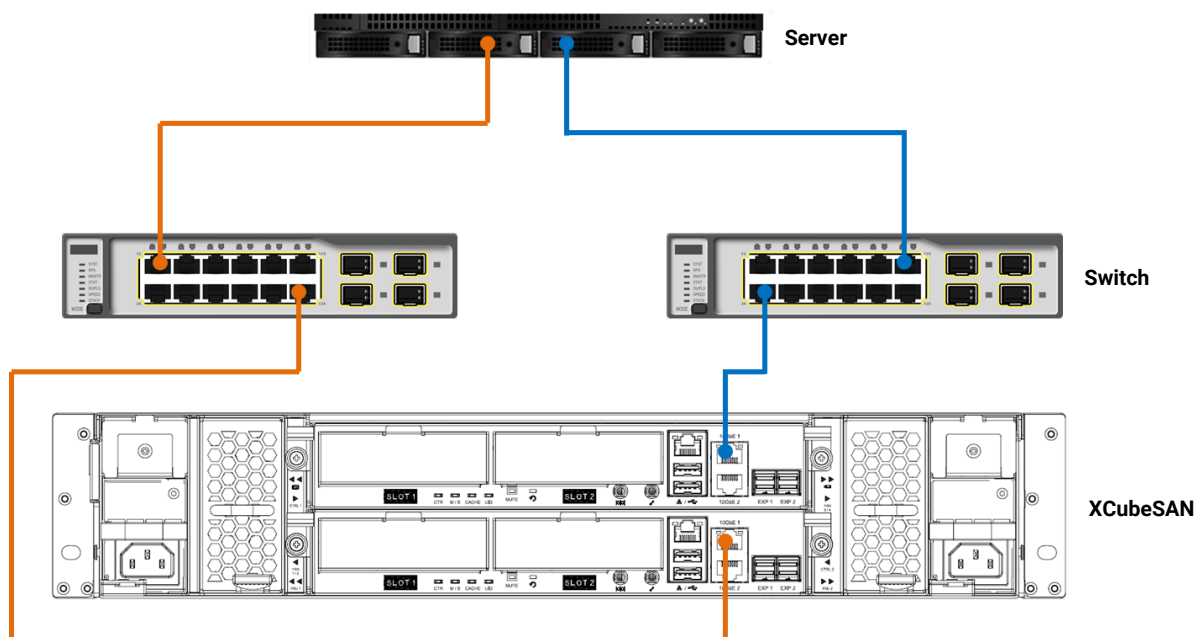


Figure 3-22 One Server / One HBA / Two Switches / One XCubeFAS / Dual Path

### 3.8.3. Expansion Deployment

#### One Server / One HBA / One XCubeFAS / One XCubeDAS / Dual Path

The following figure shows an example of a dual controller, connect enclosure configuration with one server accessing the storage. One server is connected to a dual controller XCubeFAS series using CAT 6 network cables. And a dual controller XCubeFAS series connected to a dual controller XCubeDAS XD5326 using mini SAS HD to mini SAS HD cable (SAS 12G expansion cable with Wake-on-SAS, SFF-8644 to SFF-8644).

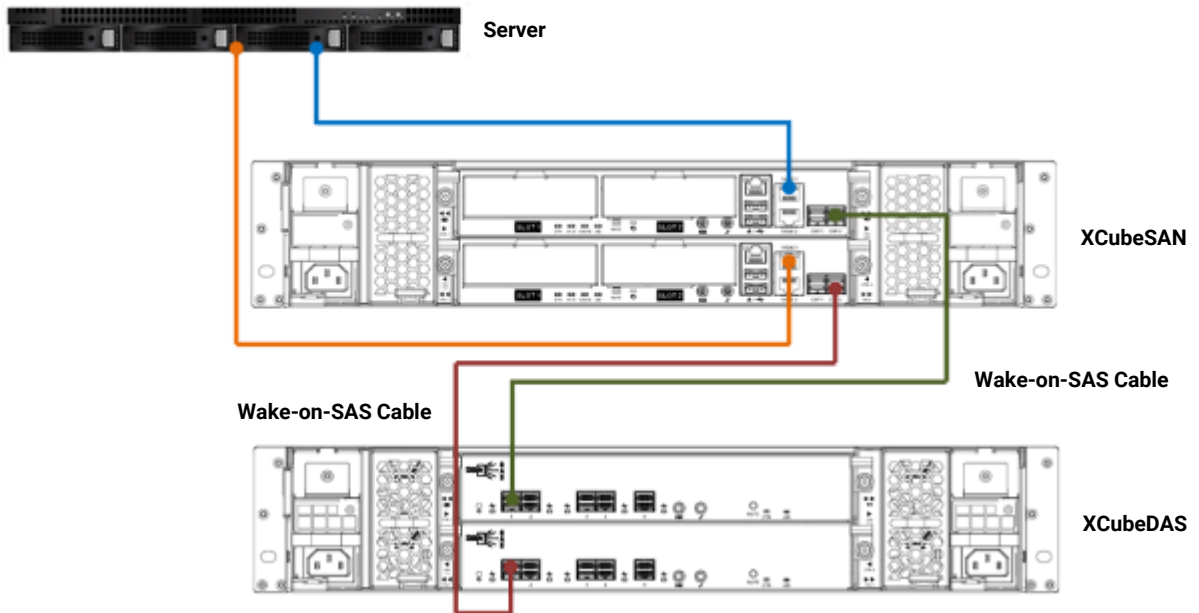
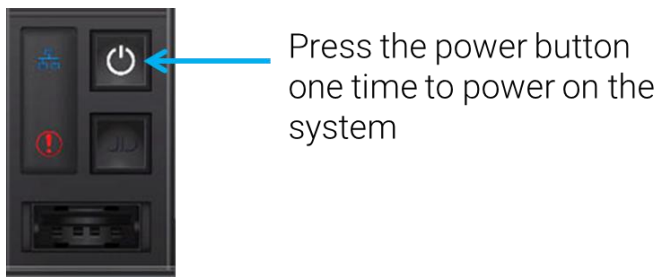


Figure 3-23 One Server / One HBA / One XCubeFAS / One XCubeDAS / Dual Path

## 3.9. Connecting Power Cords and Powering ON the System

Before you power on your XCubeFAS system for the first time, please make sure following tasks are done:

- Check the power cord type. The power cords for the XCubeFAS series will vary depending on your country/region. If you find the power cords included with your XCubeFAS system doesn't match your current country/region, you may need to buy an adapter for each power cord to connect the power outlet.  
Power cord ratings:
  - 100 – 127V~ 10A
  - 200 – 240 V~ 5A
- Install all disk drives in the system so the controllers can identify and configure them at power-up.
- Connect cables that connect the management port and data ports to your network, and then power cords to the system; finally press the power button once to power on the XCubeFAS.



Press the power button one time to power on the system

Figure 3-24 Press the Power Button One Time to Power on the System



**INFORMATION:**

The power cord rating is the minimum requirement. The rating of the power cord that you purchase must equal to or higher than the minimum requirement to ensure the system safety and reliability.

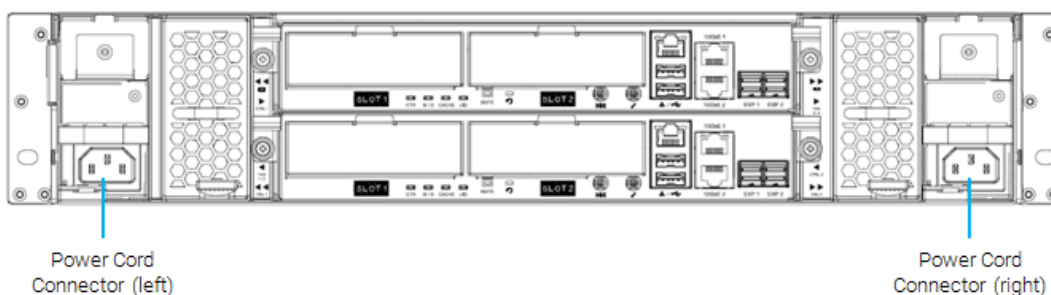


Figure 3-25 PSU Power Cord Connects



**INFORMATION:**

The Following are the operational conditions for all XCubeFAS series models:

Temperature:

- Operating temperature 0 to 40°C
- Shipping temperature -10°C to 50°C

Relative Humidity:

- Operating Relative Humidity 20% to 80% non-condensing
- Non-Operating Relative Humidity 10% to 90%



**TIP:**

The XCubeFAS series will remember the current power state when the power failed by accident. If the system is online state, after power is recovered, the system will power on automatically. If the system is offline, the system will keep power off.

## 3.10. Powering OFF the System

To power off the system, please follow the steps outlined below:

- Stop all I/O from all hosts to the SAN systems.
- Shut down the SAN system by one of the methods that are described below:
  - Press and hold the power button for **4 seconds**.



Press and hold the power button for **4 seconds** to power off the system

Figure 3-26 Power off the System by Power Button

- Via XEVO UI to shut down the system power.

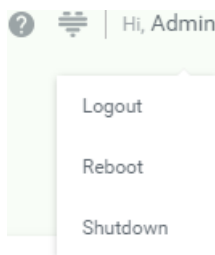



Figure 3-27 Power off the System via Web UI

### 3.11. Wake-on-LAN / Wake-on-SAS to Power ON / OFF the System

QSAN's Wake-on-SAS technology allows you to remotely power on/off all cascaded XD5300 expansion enclosures by using QSAN proprietary SAS cables. You can power on the XCubeFAS system remotely using the Wake-on-LAN feature. The XCubeFAS can work with any available Wake-on-LAN freeware and shareware. Wake-on-SAS ensures that expansion enclosures will not run idly, consuming electricity after the SAN storage system is shut down for maintenance or other purposes. Wake-on-SAS can avoid unnecessary electricity waste by allowing your devices to be on only when it is necessary. A further advantage of Wake-on-SAS is that when you turn on the SAN, the expansion enclosures will wake automatically, so there is no need to worry about degrading a volume if you forget to turn them on first.

The table below shows the available expansion cable, model name, and its description.

Table 3-13 Available Expansion Cable for XCubeFAS Series

Model Name	Picture	Description	Applied Models
CBL-12SW150		SAS 12G Expansion Cable with Wake-on-SAS, SFF-8644 to SFF-8644, 1.5 Meters (This cable is not suitable for connecting HBA or RAID card)	XF2026 Series

### 3.12. Connecting a UPS

If users want to install a UPS (uninterruptible power supply) to provide clean power and also offer protection against mains power failures, please follow the following instructions.

- Before you purchase a UPS system, please check QSAN XCubeFAS series supported UPS interfaces and communication types.
- Supported types → UPS via SNMP, Serial UPS with COM port, and USB UPS.
- Communication types → network UPS via SNMP, Serial UPS with COM port, and USB UPS. Serial communication is the only supported type.
- Connect the UPS to the XCubeFAS.

The following image is the location for the UPS connection.

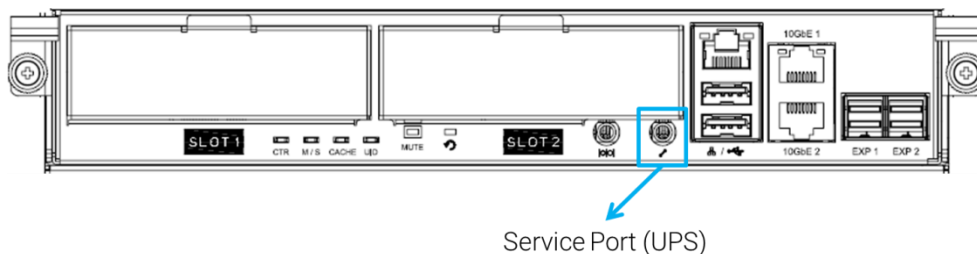



Figure 3-28 Location for the UPS System Connection

The table below shows the available UPS cable, model name, and its description.

Table 3-14 Available UPS Cable for XCubeFAS Series

Model Name	Picture	Description	Applied Models
CBL-UPS		UPS Cable, Phone-jack, 1 Meter	XF2026 Series

For checking the UPS connection and status, please refer to the chapter 6.3.3, UPS Settings and Status in the [XCubeFAS XEVO 1.0 User's Manual](#).


## 3.13. Connecting the Optional USB LCM

If you purchased the USB LCM, please use the enclosed USB extension cable (A-male to A-female) to connect to the system. The Following procedures are for the USB LCM connection:

- Connect the USB LCM to the female side of the USB extension cable.
- Connect the male side of the USB extension cable to the USB port on the system front pillar.

The table below shows the available USB LCM, model name, and its description.

Table 3-15 Available USB LCM for XCubeFAS Series

Model Name	Picture	Description	Applied Models
LCM-U162		Portable USB LCM	XF2026 Series

To learn more how to use USB LCM, please refer to the chapter 4.4, Accessing the Management USB LCM in the [XCubeFAS XEVO 1.0 User's Manual](#).

### 3.14. Discover and Carry Out the Initial Configuration for the System

After powering on the system, the next step is to discover the system on the network and start the initial configuration. To discover the system, we suggest downloading our XFinder application from the QSAN web site; this will hunt the network for your new AFA and allow you to access it via the XEVO GUI. For more information about discovering your system and the initial configuration, please refer to the chapter 3, Getting Started in the [XCubeFAS XEVO 1.0 User's Manual](#).

## 4. Deployment Types and Cabling

This chapter will show detailed deployment types and cabling for the XCubeFAS series. You can start to build up a deployment plan for your Fibre channel or iSCSI storage environment by deploying your XCubeFAS systems to your desired host. For expansion you can also attach the XCubeDAS series RAID expansion enclosures.

### 4.1. Deployment Types

XCubeFAS series supports following deployment types:

Table 4-1 Deployment Types

Deployment Type	Description
Dual Path	In a dual path deployment, two paths are connected from the host/server to the XCubeFAS system. In this deployment, both controllers in the system are used. Because dual path deployments provide two paths to the XCubeFAS system for redundancy even in the event of device, cable, or power failure. In dual-path deployment environment, disk drives must support dual paths I/O (SAS interface).
Server Attached	In multi-server attached deployment, more than one server is connected to the XCubeFAS system. In multi-server attached deployment, dual path deployment modes are supported.

For more detail deployment type and cabling, please refer following sections.



### 4.2. Cabling the System

The following examples illustrate how to configure the cabling for the XCubeFAS series. Recommended SAS cable length for the host connection is less than 3 meters. If you want to enable wake on SAS for the XCubeDAS enclosures, the QSAN genuine SAS cable with sideband is required to enable this feature. The XCubeFAS supports a maximum of up to

130 drives for the system storage space expansion; both single and dual path cabling are supported.

The table below shows the available cable, model name, and its description.

*Table 4-2 The List of Available Cable for XCubeFAS Series*

Model Name	Picture	Description	Applied Models
CBL-12SW150		SAS 12G Expansion Cable with Wake-on-SAS, SFF-8644 to SFF-8644, 1.5 Meters (This cable is not suitable for connecting HBA or RAID card)	XF2026 Series
CBL-12SH150		SAS 12G Expansion Cable, SFF-8644 to SFF-8644, 1.5 Meters	

### 4.2.1. Expansion Configuration Rules

The table below shows the rule of configuration for the XCubeFAS series and XCubeDAS expansion enclosures. You can refer the table below for maximum number of extension enclosures and disk drives prior to performing system deployment.

*Table 4-3 SAN System and Expansion Enclosure Configuration Rules*

SAN Models	Expansion Enclosures	Max. No. of Expansion Units	Max. No. of Disk Drives	Max. Raw Capacity	
				(SFF 2.4TB)	(15.36TB)
XF2026 (2U 26-bay, SFF)	XD5326 (2U 26-bay, SFF)	4	26 + 4 x 26 = 130	312TB	1996.8TB

### 4.2.2. Dual Path (MPIO) Deployment

The following images illustrate some examples of deployment types for dual controller XCubeFAS series. MPIO (MultiPath I/O) configurations are designed to provide HA (High Availability) data connections to ensure data consistency in the rare event of a failure in the host connectivity from a single path.

## One Server / One HBA / Two Switches / One XCubeFAS / Dual Path

The following figure shows an example of a dual controller, connect enclosure configuration with one server accessing the storage via switches. One server is connected to a dual controller XCubeFAS series using CAT 6 network cables.

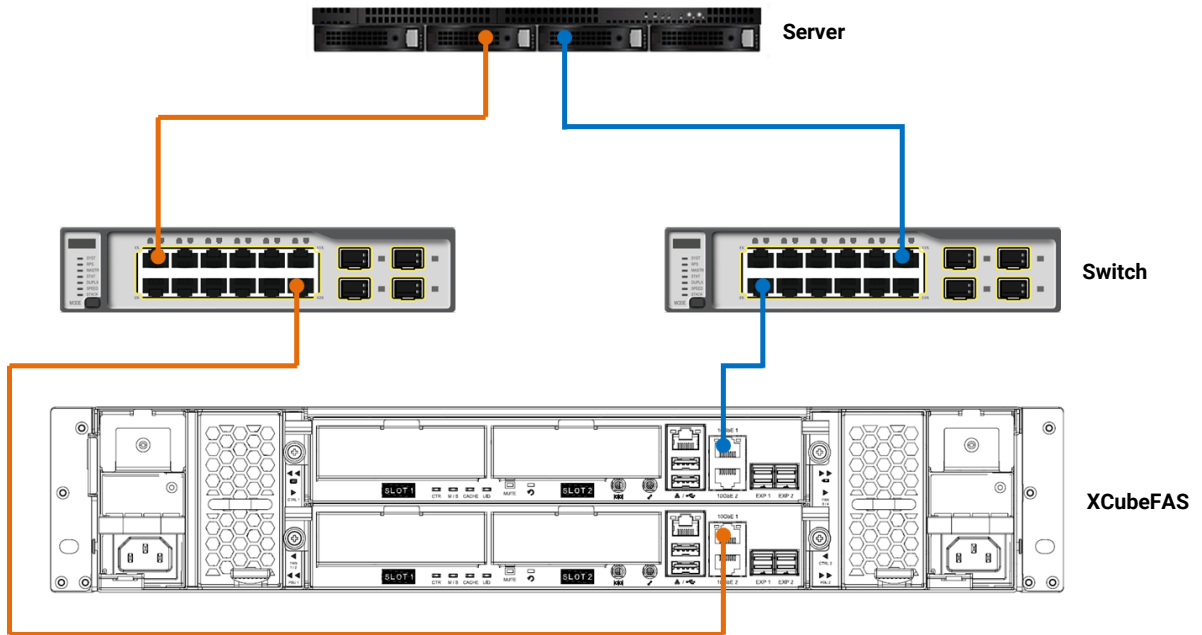


Figure 4-1 One Server / One HBA / Two Switches / One XCubeFAS / Dual Path

## One Server / One HBA / One XCubeFAS / One XCubeDAS / Dual Path

The following figure shows an example of a dual controller, connect enclosure configuration with one server accessing the storage. One server is connected to a dual controller XCubeFAS series using CAT 6 network cables. And a dual controller XCubeFAS series connected to a dual controller XCubeDAS XD5300 series using mini SAS HD to mini SAS HD cable (SAS 12G expansion cable with Wake-on-SAS, SFF-8644 to SFF-8644).

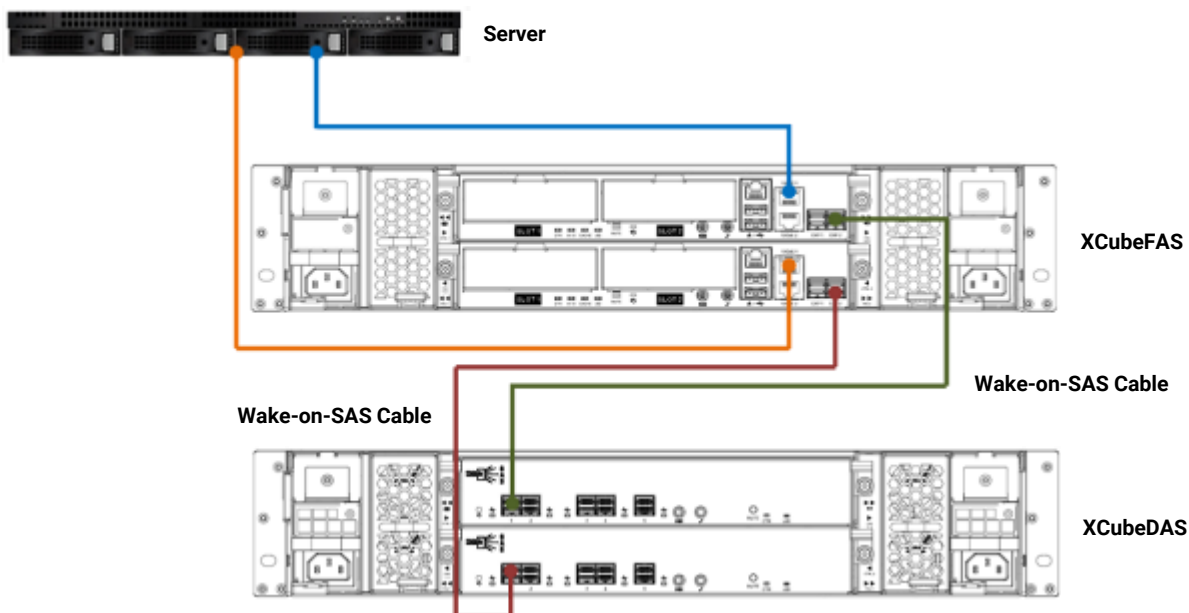


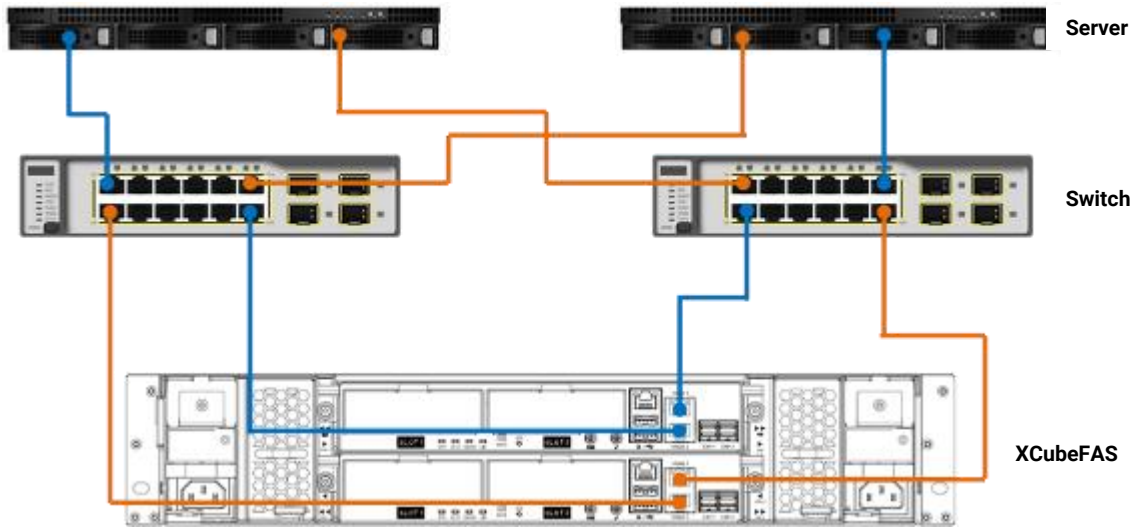
Figure 4-2 One Server / One HBA / One XCubeFAS / One XCubeDAS / Dual Path

### 4.2.3. Multi-server Attached Cabling Deployment

The following images illustrate some examples of multi-server deployment types.

#### Two Servers / One HBA per Server / Two Switches / One XCubeFAS / Dual Path

The following figure shows an example of a dual controller, connect enclosures configuration with two servers accessing the storage via switches. Two servers are connected to a dual controller XCubeFAS series using CAT 6 network cables.



*Figure 4-3 Two Servers / One HBA per Server / Two Switches / One XCubeFAS / Dual Path*

## **Ten Servers / One HBA per Server / One XCubeFAS / Dual Path**

If customers purchase optional host cards, the following is the cabling example. The following figure shows an example of a dual controller, direct connect enclosure configuration with ten servers accessing the storage. Two servers connect to the on-board 10GbE iSCSI (RJ45) ports. Eight servers connect to the optional host cards. To learn more about host cards support and installation, please refer to the chapter 3.3, [Installing the Optional Host Cards](#).

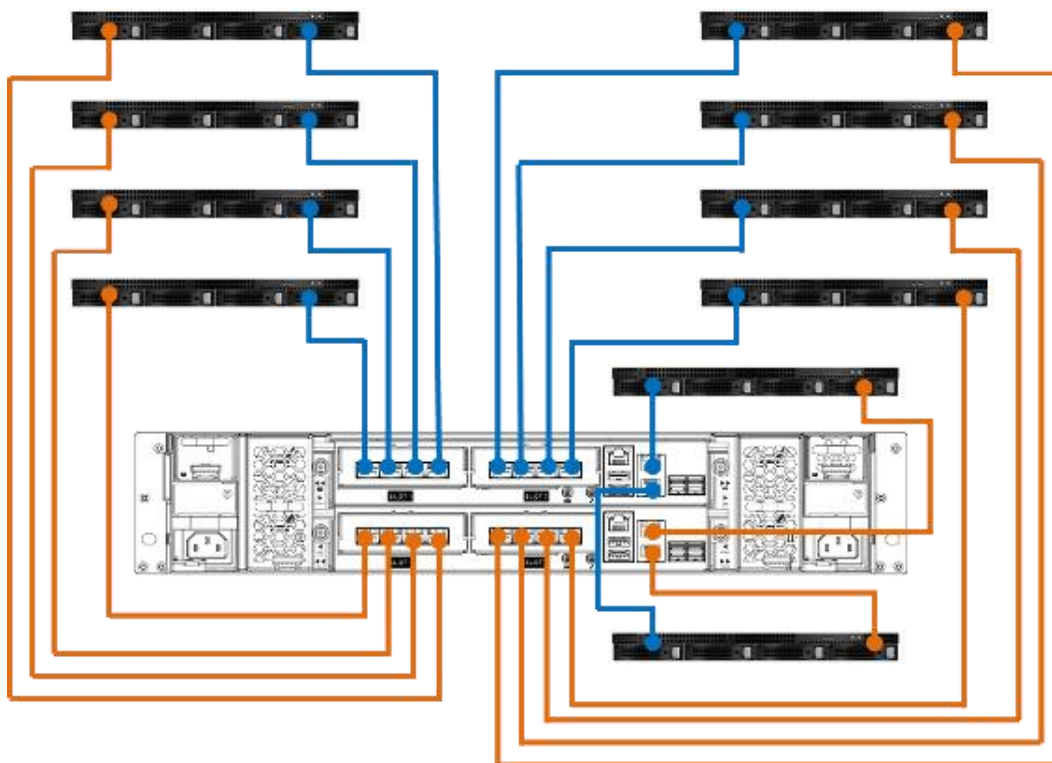


Figure 4-4 Ten Servers / One HBA per Server / One XCubeFAS / Dual Path

#### 4.2.4. Expansion Topology and Deployment

The following images illustrate some examples of expansion topology and deployment types for dual controller XCubeFAS series.

##### **Cascade Topology: One XCubeFAS / One XCubeDAS / Dual Path**

The following figure shows an example of a dual controller XCubeFAS series connected to a dual controller XCubeDAS XD5300 series using mini SAS HD to mini SAS HD cable (SAS 12G expansion cable with Wake-on-SAS, SFF-8644 to SFF-8644).

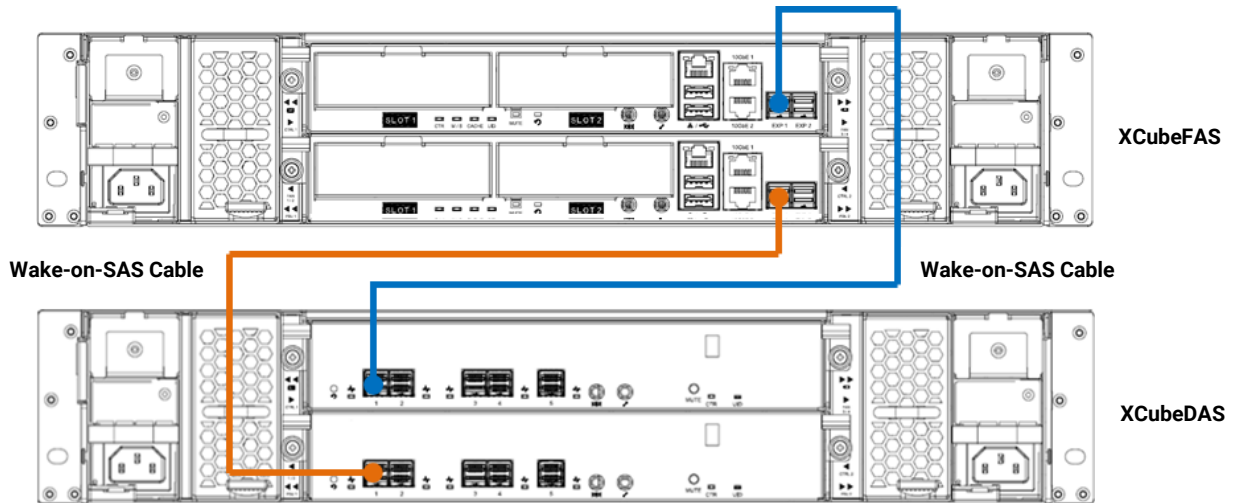


Figure 4-5 Cascade Topology: One XCubeFAS / One XCubeDAS / Dual Path

## Cascade Topology: One XCubeFAS / Two XCubeDAS / Dual Path

The following figure shows an example of a dual controller XCubeFAS series connected to a dual controller XCubeDAS XD5300 series which is in turn connected to the second dual controller XCubeDAS XD5300 series using mini SAS HD to mini SAS HD cable (SAS 12G expansion cable with Wake-on-SAS, SFF-8644 to SFF-8644).

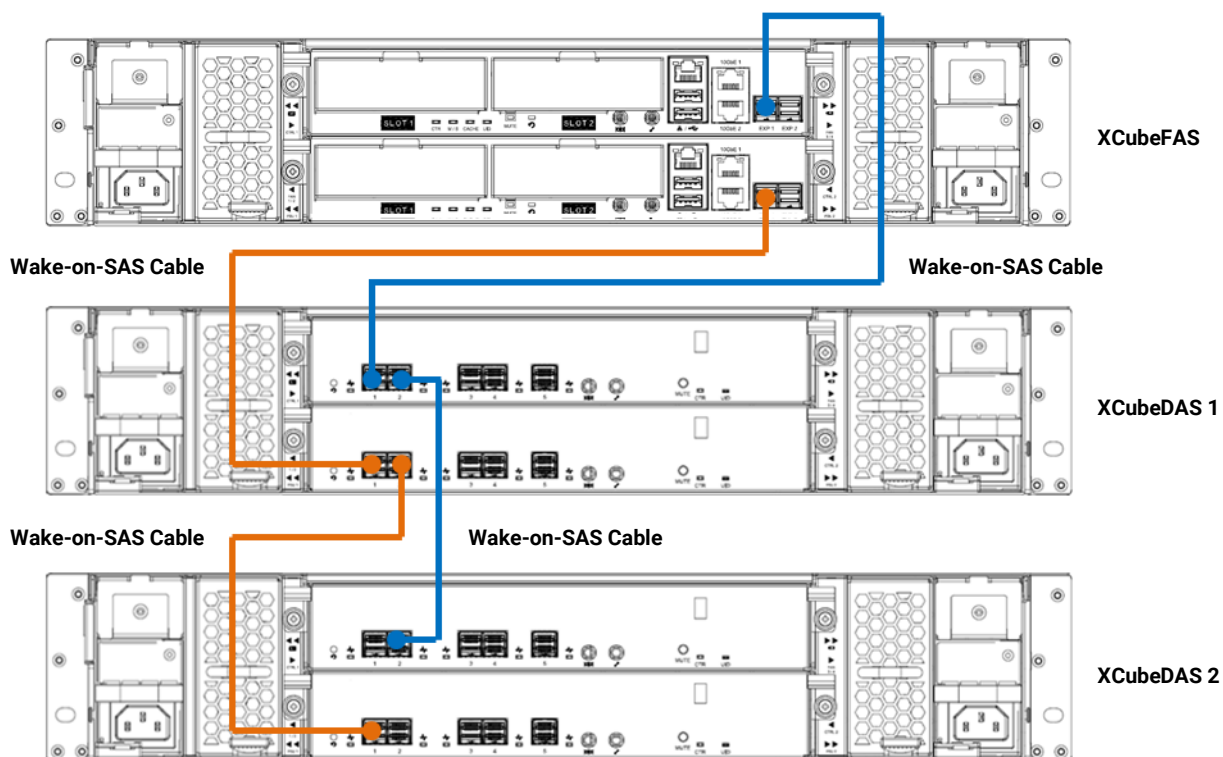


Figure 4-6 Cascade Topology: One XCubeFAS / Two XCubeDAS / Dual Path

### Reverse Topology: One XCubeFAS / Two XCubeDAS / Dual Path

The XCubeDAS can be connected in redundant connection mode based on forward direction and backward direction. This provides the optimal networking reliability.

The following figure shows an example of a dual controller XCubeFAS series connected to a dual controller XCubeDAS XD5300 series which is in turn connected to the second dual controller XCubeDAS XD5300 series using mini SAS HD to mini SAS HD cable (SAS 12G expansion cable with Wake-on-SAS, SFF-8644 to SFF-8644). The connection in forward direction is shown as blue cables. The connection in backward direction is shown as orange cables.

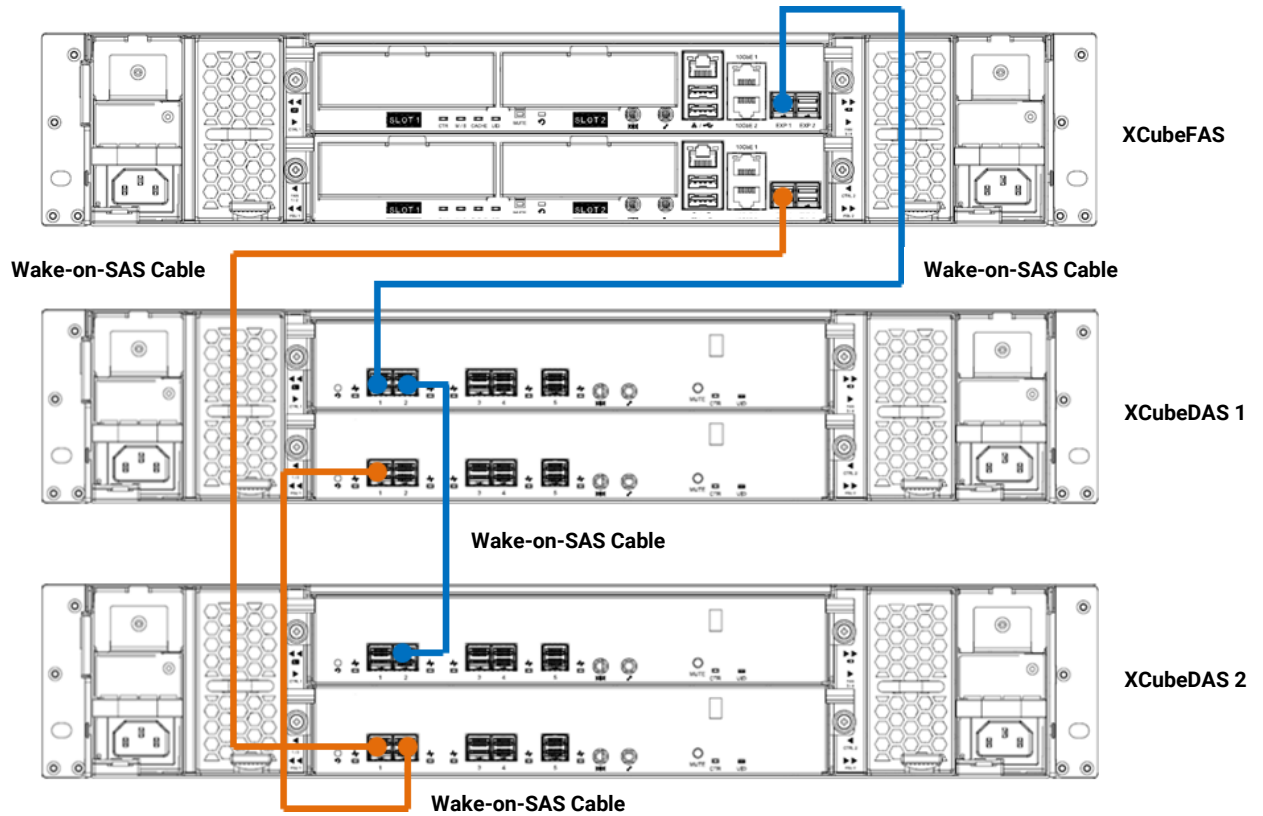


Figure 4-7 Reverse Topology: One XCubeFAS / Two XCubeDAS / Dual Path

## Tree Topology: One Server / Two XCubeDAS

The XCubeDAS can be connected in tree topology to reduce the latency.

The following figure shows an example of a dual controller XCubeFAS series connected to two dual controller XCubeDAS XD5300 series using mini SAS HD to mini SAS HD cable (SAS 12G expansion cable with Wake-on-SAS, SFF-8644 to SFF-8644).

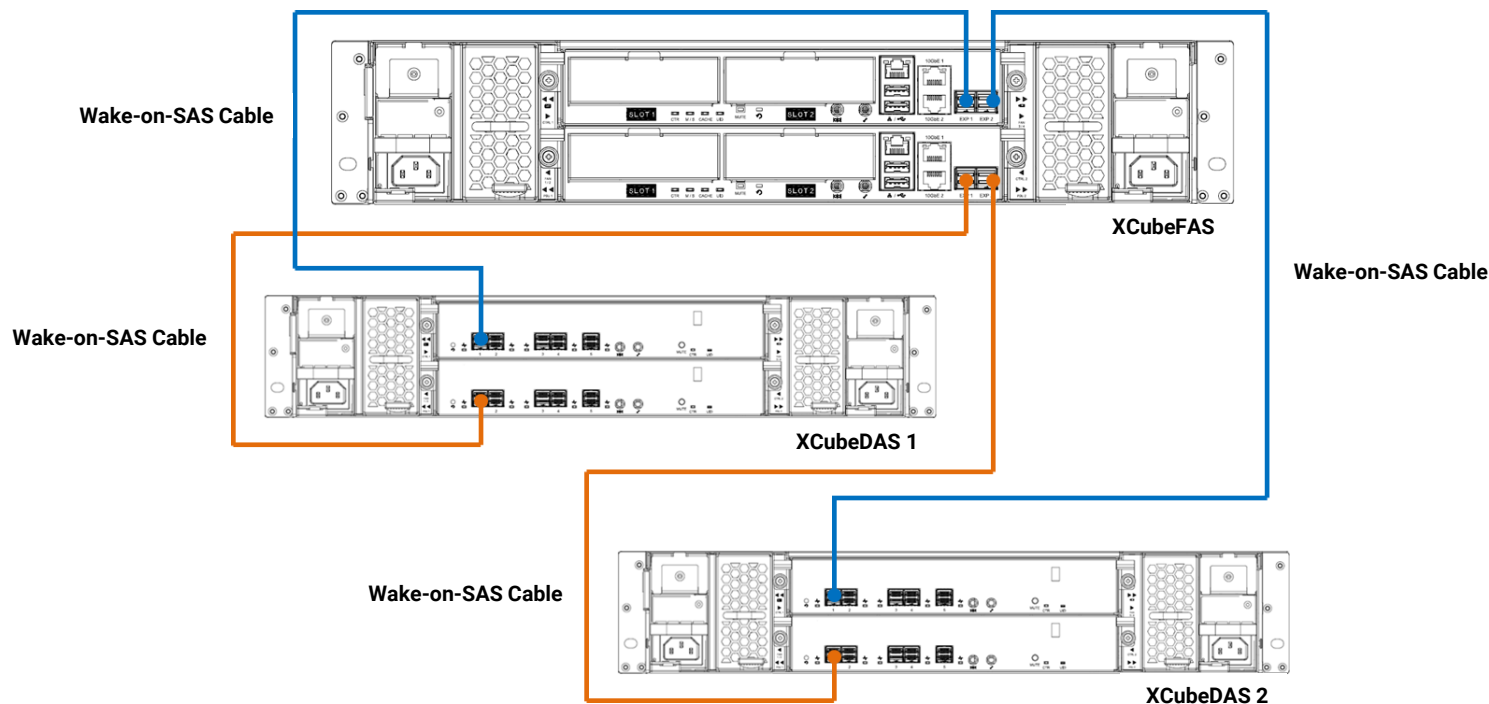


Figure 4-8 Tree Topology: One XCubeFAS / Two XCubeDAS / Dual Path

## 4.2.5. Introduction of Remote Replication

If users purchase two or more XCubeFAS series systems and plan to deploy them in different locations, the **Remote Replication** function in QSAN XEVO supports multiple topologies to suit various disaster recovery configurations. The following remote replication topologies are possible using native replication:

### One-Directional



Figure 4-9 One-Directional Remote Replication

A Source Volume (S) in Site A is replicating to a Target Volume (T) in Site B. This is the most basic remote replication topology.

## Bi-Directional

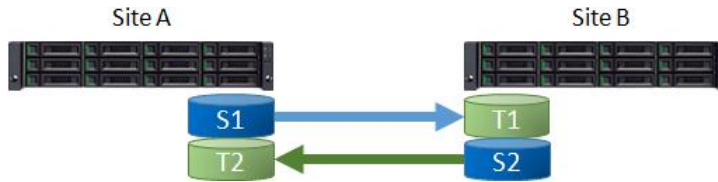


Figure 4-10 Bi-Directional Remote Replication

Each system in a two system topology acts as a replication target for the other's production data. A Source Volume (S1) in Site A is replicating to a Target Volume (T1) in Site B. And a Source Volume (S2) in Site B is replicating to a Target Volume (T2) in Site A.

## One-to-Many

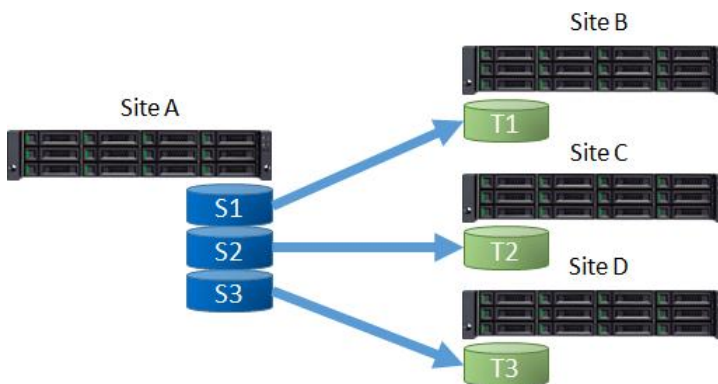


Figure 4-11 One-to-Many Remote Replication

A single source system replicates different storage resources to multiple target systems. A Source Volume (S1) in Site A is replicating to a Target Volume (T1) in Site B. At the same time, a Source Volume (S2) in Site A is replicating to a Target Volume (T2) in Site C. So does S3 in Site A to T3 in Site D.

## Many-to-One

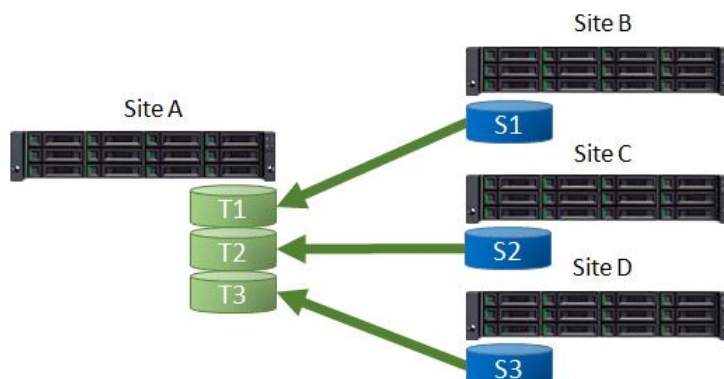


Figure 4-12 Many-to One Remote Replication

Multiple source systems replicate to a single target system. A Source Volume (S1) in Site B is replicating to a Target Volume (T1) in Site A. At the same time, a Source Volume (S2) in Site C is replicating to a Target Volume (T2) in Site A. So does S3 in Site D to T3 in Site A.

## Many-to-Many

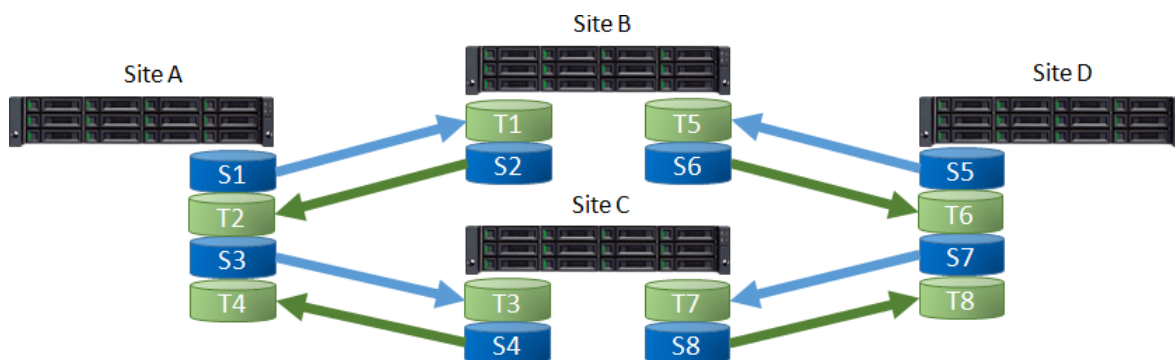


Figure 4-13 Many-to Many Remote Replication

Combination with bi-Directional, one-to-many, and many-to-one, remote replication also supports Many-to-Many topology. Multiple source systems replicate to multiple target systems. A Source Volume (S1) in Site A is replicating to a Target Volume (T1) in Site B. At the same time, a Source Volume (S2) in Site B is replicating to a Target Volume (T2) in Site A. And does S3 to T3, S4 to T4, ..., S8 to T8.

**TIP:**

Note that all supported topologies have a 1-to-1 configuration for each individual replication session in the topology.

The maximum replication task quantity per system is 32. It means that 32 systems are the maximum quantity of any many-to-one or one-to-many replication configuration.

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If you want to learn more about the operations on remote replication, please refer to the Chapter 12.3, Managing Remote Replications in the [XCubeFAS XEVO 1.0 User's Manual](#).

## 5. Descriptions of LEDs and Buttons

In this chapter, you can find all LED definitions and button behaviors of the XCubeFAS series models. By reviewing this chapter, you will have a basic understanding about the current status of the system or specific components by recognizing the LED status.

### 5.1. Front Panel

In this session, we will describe the system controls and indicators, and the disk drive LEDs in the front panel.

#### 5.1.1. System Controls and Indicators

XCubeFAS features the button and indication module on the right ear. Please refer to the following content for definitions of LED behaviors.

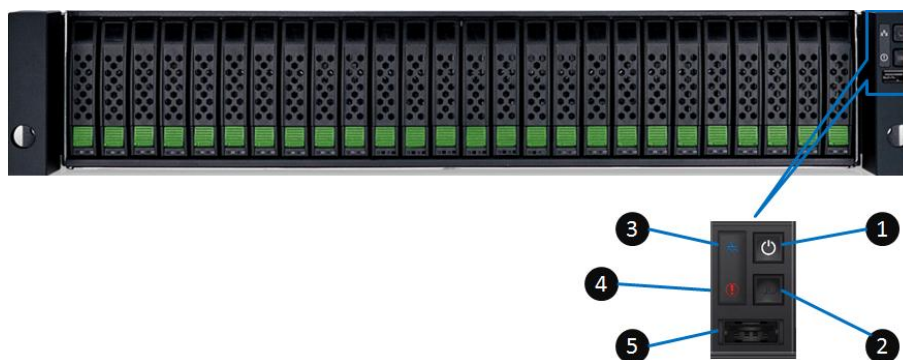


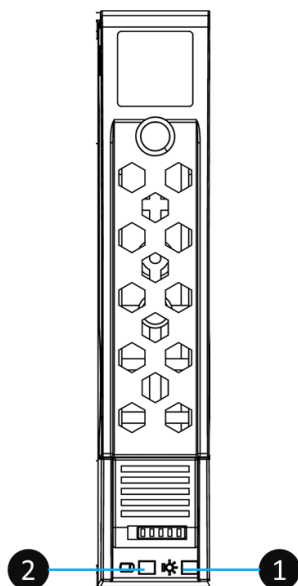
Figure 5-1 System Controls and Indicators

Table 5-1 Descriptions of the System Controls and Indicators LEDs

Number	Description	Definition
1	Enclosure Power Button/LED	<p><b>Power Button</b></p> <ul style="list-style-type: none"> <li>Press the button one time to turn ON the system power and keep pressing for 4 seconds to turn OFF the system power.</li> </ul> <p><b>Power LED</b></p> <ul style="list-style-type: none"> <li>Solid <b>White</b>: Power is ON (at least one power supply unit is supplying power to the system).</li> <li>Blinking <b>White</b>: The system is in the stage of boot or shutdown.</li> <li>Off: The system is shutdown.</li> </ul>
2	UID Button/LED	<p><b>UID (Unique Identifier) button</b></p> <ul style="list-style-type: none"> <li>Press the button one time to turn it ON; press it again to turn it OFF.</li> </ul> <p><b>UID (Unique Identifier) LED</b></p> <ul style="list-style-type: none"> <li>Press the button to turn it ON, and press it again to turn it OFF.</li> <li>Solid <b>Blue</b>: The system has been identified.</li> <li>Off: The system has not been identified.</li> </ul>
3	Enclosure Access LED	<p><b>Enclosure Access LED</b> (Indicate the host interface connectivity.)</p> <ul style="list-style-type: none"> <li>Blinking <b>Blue</b>: The host interface activity is on-going.</li> <li>Off: There is no host interface activity.</li> </ul>
4	Enclosure Status LED	<p><b>Status LED</b> (Indicate current health status of the system.)</p> <ul style="list-style-type: none"> <li>Solid <b>Amber</b>: System has errors including PSU failure, abnormal voltage, abnormal temperature, any fan module failed or removed, controller degraded, pool degraded, pool failure, SSD cache pool degraded, or SSD cache pool failure.</li> <li>Off: The system is healthy.</li> </ul>
5	USB Port	The USB port can be plug in the LCM (LCD Module).

### 5.1.2. Disk Drive LEDs

Please refer to the following content for definitions of LED behaviors.



SFF Disk Drive Tray

Figure 5-2 Disk Drive Indicators of SFF Disk Drive Tray

Table 5-2 Descriptions of Disk Drive LEDs

Number	Description	Definition
1	Disk Drive Power LED	<ul style="list-style-type: none"> <li>Solid <b>Blue</b>: The disk drive is inserted and no data access.</li> <li>Blinking <b>Blue</b>: The disk drive is accessing data.</li> <li>Off: There is no disk drive inserted.</li> </ul>
2	Disk Drive Status LED	<ul style="list-style-type: none"> <li>Solid <b>Amber</b>: There is disk drive error.</li> <li>Blinking <b>Amber</b> (interval of 0.5 sec): The disk drive is rebuilding.</li> <li>Blinking <b>Amber</b> (interval of 0.05 sec): Identify the disk drive.</li> <li>Off: The disk drive is healthy.</li> </ul>

## 5.2. Rear Panel

In this session, we will describe the system control LEDs, PSU LEDs, host card LEDs, and the cache-to-flash module LED in the rear panel.

### 5.2.1. Controller LEDs

Please refer to the following content for definitions of the LED behaviors.

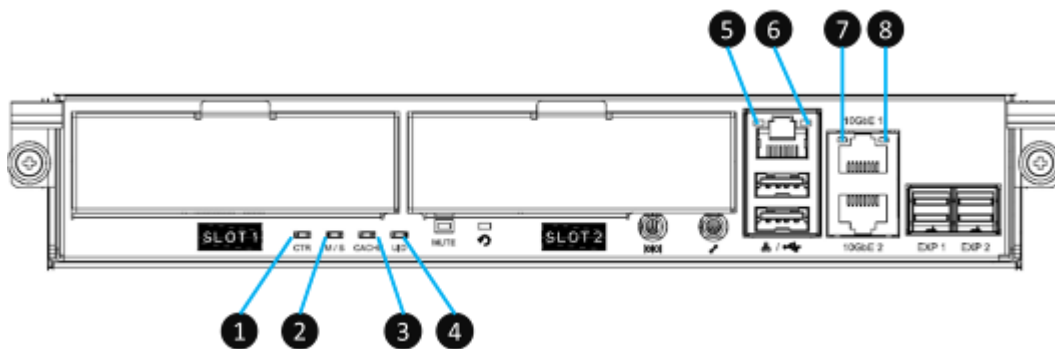


Figure 5-3 The Controller LEDs

Table 5-3 Descriptions of XCubeFAS Series Controller LEDs

Number	Description	Definition
1	Controller Status LED	<ul style="list-style-type: none"> <li>Solid <b>Green</b>: Controller status is normal.</li> <li>Solid <b>Red</b>: System is booting or the controller is failed.</li> </ul>
2	Master / Slave LED (only for dual controllers)	<ul style="list-style-type: none"> <li>Solid <b>Green</b>: This is the Master controller.</li> <li>Off: This is the Slave controller.</li> </ul>
3	Dirty Cache LED	<ul style="list-style-type: none"> <li>Solid <b>Amber</b>: Data on the cache is waiting for flush to disks.</li> <li>Off: There is no data on the cache.</li> </ul>
4	UID (Unique Identifier) LED	<ul style="list-style-type: none"> <li>Solid <b>Blue</b>: The enclosure has been identified.</li> <li>Off: The enclosure is not being identified.</li> </ul>
5	Management Port Connection LED	<ul style="list-style-type: none"> <li>Solid <b>Green</b>: The connection is built and normal.</li> <li>Off: No connection is built.</li> </ul>

6	Management Port Accessing LED	<ul style="list-style-type: none"> <li>Blinking <b>Amber</b>: Data is accessing.</li> </ul>
7	10GbE iSCSI Port 1 LED	<ul style="list-style-type: none"> <li>Blinking <b>Amber</b>: Data is accessing.</li> </ul>
8	10GbE iSCSI Port 2 LED	<ul style="list-style-type: none"> <li>Blinking <b>Amber</b>: Data is accessing.</li> </ul>

## 5.2.2. Power Supply Unit LED

Please refer to the following content for definitions of the LED behaviors.

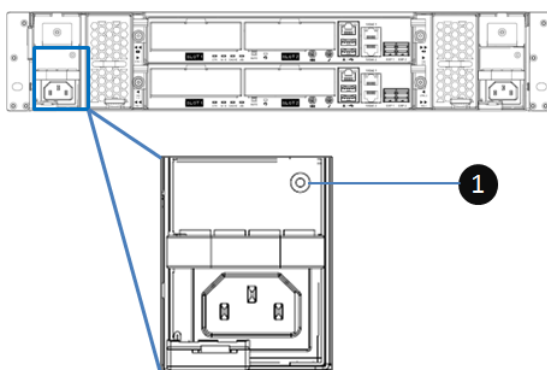


Figure 5-4 The Power Supply Unit LED

Table 5-4 Descriptions of the Power Supply Unit LED

Number	Description	Definition
1	PSU LED	<ul style="list-style-type: none"> <li>Solid <b>Green</b>: The PSU is on and normal.</li> <li>Blinking <b>Green</b>: The PSU is off, +5VSB (Standby) is on.</li> <li>Solid <b>Amber</b>: There is critical event caused shutdown.</li> <li>Blinking <b>Amber</b>: There are PSU warning events including high temperature, high power, high current, slow fan, or under input voltage.</li> </ul>

## 5.2.3. Host Card LEDs

Please refer to the following content for definitions of the LED behaviors.

4-port 16Gb Fibre Channel Host Card (SFP+) LEDs

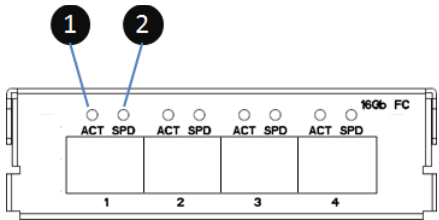


Figure 5-5 4-port 16Gb Fibre Channel Host Card (SFP+) LEDs

Table 5-5 Descriptions of 4-port 16Gb Fibre Channel Host Card (SFP+) LEDs

Number	Description	Definition
1	Activity LED	<ul style="list-style-type: none"><li>• Solid <b>Green</b>: Asserted when the link is establish (Link OK without I/O).</li><li>• Blinking <b>Green</b>: Asserted when the link is established and packets are being transmitted along with any receive activity (Access).</li><li>• Off: No link is detected or link fails.</li></ul>
2	Speed LED	<ul style="list-style-type: none"><li>• Solid <b>Blue</b>: Asserted when a 16G link is established and maintained.</li><li>• Solid <b>Amber</b>: Asserted when an 8G link is established and maintained.</li><li>• Solid <b>White</b>: Asserted when a 4G and below link is established and maintained</li><li>• Off: No link is detected or link fails.</li></ul>

## 2-port 16Gb Fibre Channel Host Card (SFP+) LEDs

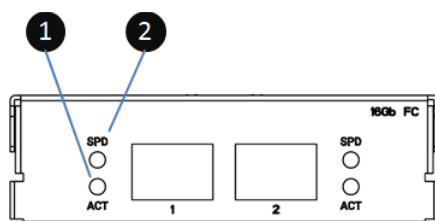


Figure 5-6 2-port 16Gb Fibre Channel Host Card (SFP+) LEDs

Table 5-6 Descriptions of 2-port 16Gb Fibre Channel Host Card (SFP+) LEDs

Number	Description	Definition
1	Activity LED	<ul style="list-style-type: none"> <li>Solid <b>Green</b>: Asserted when the link is establish (Link OK without I/O).</li> <li>Blinking <b>Green</b>: Asserted when the link is established and packets are being transmitted along with any receive activity (Access).</li> <li>Off: No link is detected or link fails.</li> </ul>
2	Speed LED	<ul style="list-style-type: none"> <li>Solid <b>Blue</b>: Asserted when a 16G link is established and maintained.</li> <li>Solid <b>Amber</b>: Asserted when an 8G link is established and maintained.</li> <li>Solid <b>White</b>: Asserted when a 4G and below link is established and maintained</li> <li>Off: No link is detected or link fails.</li> </ul>

## 4-port 10GbE iSCSI Host Card (SFP+) LEDs

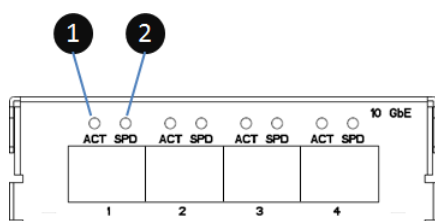


Figure 5-7 4-port 10GbE iSCSI Host Card (SFP+) LEDs

Table 5-7 Descriptions of 4-port 10GbE iSCSI Host Card (SFP+)LEDs

Number	Description	Definition
1	Activity LED	<ul style="list-style-type: none"> <li>Blinking <b>Green</b>: Asserted when the link is established and packets are being transmitted along with any receive activity (Access).</li> <li>Off: No link is detected or link fails.</li> </ul>
2	Speed LED	<ul style="list-style-type: none"> <li>Solid <b>Blue</b>: Asserted when a 10G link is established and maintained.</li> <li>Solid <b>Amber</b>: Asserted when a 1G link is established and maintained.</li> <li>Off: No link is detected or link fails.</li> </ul>

## 2-port 10GBASE-T iSCSI Host Card (RJ45) LEDs

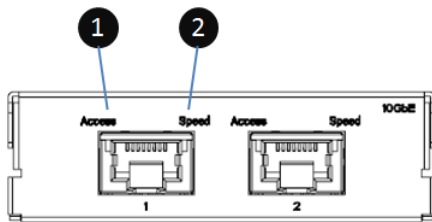


Figure 5-8 2-port 10GBASE-T iSCSI Host Card (RJ45) LEDs

Table 5-8 Descriptions of 2-port 10GBASE-T iSCSI Host Card (RJ45) LEDs

Number	Description	Definition
1	Access LED	<ul style="list-style-type: none"> <li>Blinking <b>Green</b>: Asserted when the link is established and packets are being transmitted along with any receive activity (Access).</li> <li>Off: No link is detected or link fails.</li> </ul>
2	Speed LED	<ul style="list-style-type: none"> <li>Solid <b>Green</b>: Asserted when a 10G link is established and maintained.</li> <li>Solid <b>Amber</b>: Asserted when a 1G link is established and maintained.</li> <li>Off: No link is detected or link fails.</li> </ul>

## 4-port 1GBASE-T iSCSI Host Card (RJ45) LEDs

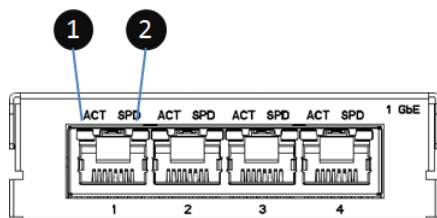


Figure 5-9 4-port 1GBASE-T iSCSI Host Card (RJ45) LEDs

Table 5-9 Descriptions of 4-port 1GBASE-T iSCSI Host Card (RJ45) LEDs

Number	Description	Definition
1	Activity LED	<ul style="list-style-type: none"> <li>Blinking <b>Green</b>: Asserted when the link is established and packets are being transmitted along with any receive activity (Access).</li> <li>Off: No link is detected or link fails.</li> </ul>
2	Speed LED	<ul style="list-style-type: none"> <li>Solid <b>Amber</b>: Asserted when a 1G link is established and maintained.</li> <li>Solid <b>Green</b>: Asserted when a 100M link is established and maintained.</li> <li>Off: No link is detected or link fails.</li> </ul>

## 5.2.4. Cache-to-Flash Module LEDs and Button

Please refer to the following content for definitions of the LED and button behaviors.

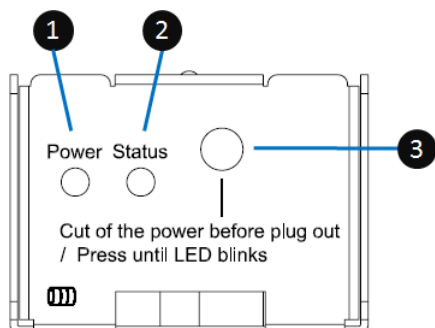


Figure 5-10 Flash Module LEDs and Button

Table 5-10 Descriptions of Flash Module LEDs and Button

Number	Description	Definition
1	Power LED	<ul style="list-style-type: none"> <li>• Solid <b>Green</b>: Power is good at flash module.</li> <li>• Off: There is no power at flash module.</li> </ul>
2	Status LED	<ul style="list-style-type: none"> <li>• Solid <b>Blue</b>: The status of flash module is good.</li> <li>• Blinking <b>Blue</b> and <b>Amber</b> Interlaced: Installing or removing the flash module.</li> <li>• Solid <b>Amber</b>: The flash module is failed or wrong PCIe connection speed.</li> </ul>
3	Attention Button	Used to prompt system that the flash module can be removed later.



**CAUTION:**

The flash module of Cache-to-Flash is hot swappable because it is a PCIe device. Before removing the flash module from the system chassis, you must press the attention button until the flash module status LED finished blinking. Otherwise, the flash module maybe damage. For more information about Cache-to-Flash modules, please refer to the chapter 3.5, [Installing the Optional Cache-to-Flash Modules](#) section and the chapter 6.5, [Removing the Cache-to-Flash Modules](#) section.

## 6. Quick Maintenance

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This chapter provides quick maintenance and instruction of removing / installing FRU (Field Replaceable Unit) or optional components of all the XCubeFAS series models. All of the XCubeFAS models feature the HA design, any of the FRU components can be hot swapped and replaced with zero downtime in the rare event of a component failure. If you encounter any issues caused by FRU components while operating the XCubeFAS, please refer to related section and follow the quick troubleshooting procedures step by step.

**CAUTION:**

We recommend that all maintenance is carried out by a certified technician. Do not attempt to carry out any maintenance outside of those outlined in the following section of this guide. System damage due to incorrect maintenance or FRU replacement can affect your product warranty. If you are unsure of the problem related to your XCubeFAS series system, we strongly recommend you to contact or get help from QSAN support team:

- Via the Web: <https://qsan.com/support>
  - Via Telephone: +886-2-7720-2118 extension 136  
(Service hours: 09:30 - 18:00, Monday - Friday, UTC+8)
  - Via Skype Chat, Skype ID: qsan.support  
(Service hours: 09:30 - 02:00, Monday - Friday, UTC+8, Summer time: 09:30 - 01:00)
  - Via Email: [support@qsan.com](mailto:support@qsan.com)
- 

### 6.1. Removing / Installing the Controller Module

This section outlines how to check the status of your controller module and the procedure of removing / installing the controller module when encountering problems.

## Removing the Controller Module



### CAUTION:

The controller module is heavy and fragile; please use both hands while installing, removing, or carrying the controller module. Recommended place for removing the controller module: the system is in a well secured rack or on a stable surface.

If you see that the controller is empty in **red** box in the XEVO UI **System** -> **Arrays**, and the Controller Status becomes Degrade in the XEVO UI **System** -> **Maintenance** or the controller status LED shows solid **red** color, which means your controller module is encountering an issue or a hardware configuration mismatch (different memory size or different types of host cards are installed in the same slot number of different controllers) and need to be replaced immediately. You need to follow the procedures below to remove problematic controller module and install a healthy one.

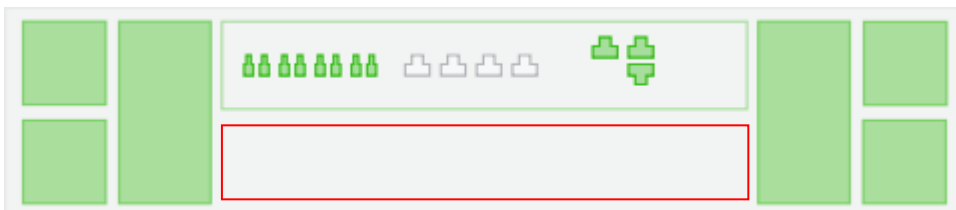
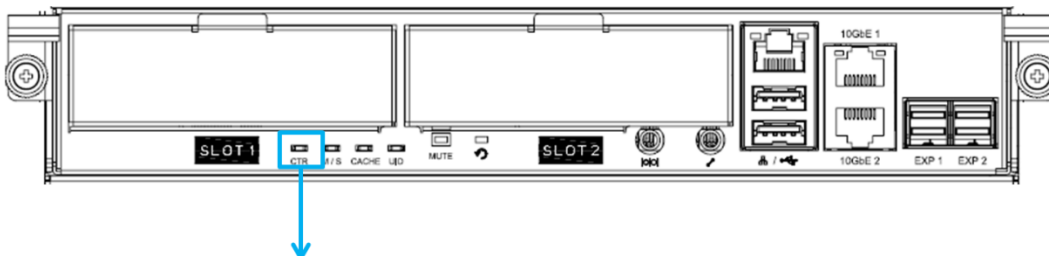


Figure 6-1 Warning Message of Failed Controller Module in the XEVO UI



If controller status LED shows solid red, it means the controller module encounters some sort of issues or hardware configuration mismatch.

Figure 6-2 Warning Message of Controller Module by the Status LED

- The following images illustrate mechanical components of the controller module.

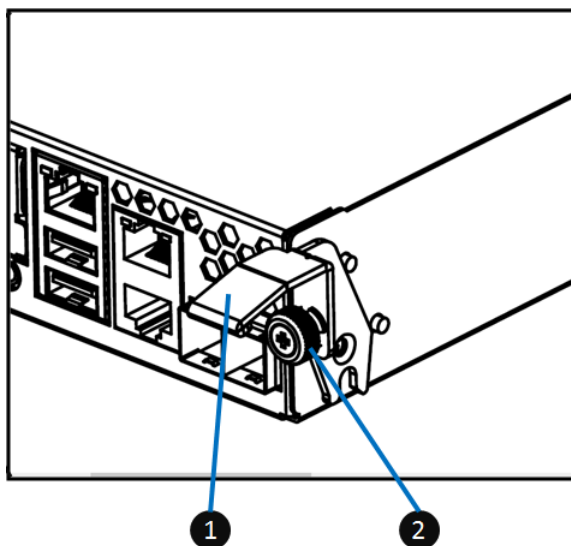


Figure 6-3 Mechanical Components of the Controller Module

Table 6-1 Mechanical Components of the Controller Module

Number	Description
1	Release Lever
2	Thumb Screw

The following are detailed steps for removing the controller module from the system chassis.

- Use a Phillips screwdriver to loosen the thumb screws on each release levers.
- Pull down both release levers at the same time and then pull out about half length of the controller module by holding two release levers.
- Use one hand to hold one end of the controller module (the side with release levers) and the other hand hold the bottom of the controller; pull out the controller module until it is free from the system chassis.

### Installing the Controller Module

The following content and images are the detail steps of installing the controller module into the system chassis.

- Make sure the position of both release levers of the controller is at downward.
- Align and place the controller to the empty controller slot.

- Push the controller module all the way into the controller slot until the position of two release levers move upward automatically.
- Pull up both release leavers at the same time until they totally parallel with the controller cage and then use a Phillips screw driver to tighten both screws.
- After about 150 seconds from the time you have installed the controller module into the system chassis, the status LED will show solid **green** color if controller module is successfully installed, then the XEVO UI will display a controller rear image and Controller Status becomes Normal in the XEVO UI **System** -> **Maintenance**.

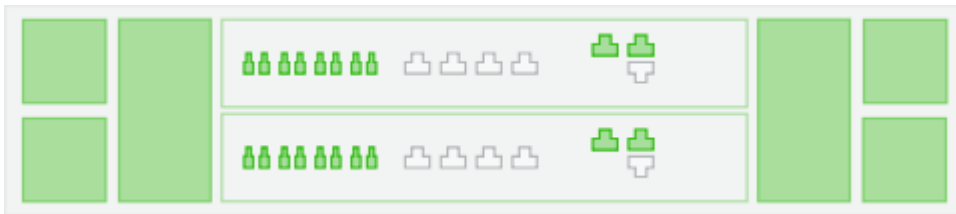


Figure 6-4 Screenshot of the Controller Module Successfully Installed in XEVO UI

## 6.2. Removing / Installing the Power Supply Unit

The standard XCubeFAS series system comes with two redundant PSUs (Power Supply Units) that allow users to hot swap it when one of the PSUs is not functioning.



### CAUTION:

The power supply unit is heavy and fragile; please use both hands while installing, removing, or carrying the controller module. Recommended place for removing the controller module: the system is in a well secured rack or on a stable surface.

If you see the Power Supply showing **red** box in the XEVO UI **System** -> **Arrays**, or the PSU LED shows solid or blinking **amber** color which means your PSU has encountered an issue and need to be replaced immediately. You need to follow the procedure of how to remove problematic PSU module and install a healthy one.

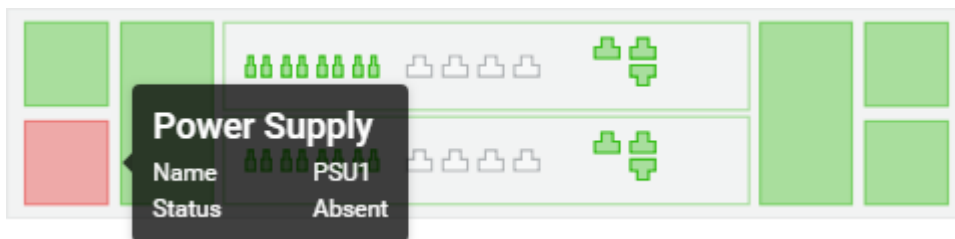


Figure 6-5 Warning Message of Failed PSU in XEVO UI

## Removing the Power Supply Unit

The images and the table below provide description of mechanical components of the PSU. Please be sure to use the correct installation direction of the PSU to prevent any potential damage by improper installation.

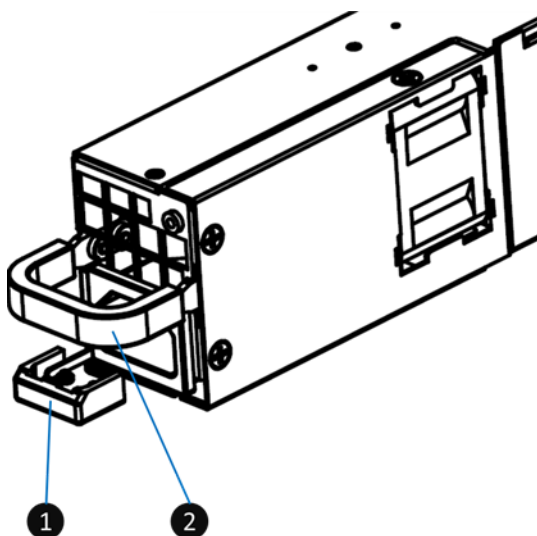


Figure 6-6 Mechanical Components of the PSU

Table 6-2 Mechanical Components of the PSU

Number	Description
1	PSU Release Tab
2	PSU Handle

Before removing the PSU, disconnect the power cord from the wall outlet; then remove the other end that is connected to the PSU.

The following are detailed steps of removing a PSU from the system chassis.

- Hold the PSU handle first, and then press the release tab.

- Pull out the power supply about half of the total PSU length.
- Use one hand to hold one end of the PSU (the side with release tab) and the other hand hold the bottom of the power supply unit; pull out the power supply unit until it is free from the system chassis.

## Installing the Power Supply Unit

The following are detailed steps of installing the PSU into the system chassis.

- Use one hand to hold one end of the power supply unit (the side with release tab and handle) and the other hand hold the bottom of the power supply unit; then align the PSU with the empty PSU slot.
- Push the PSU all the way into the empty slot until you hear the “click” sound from the release tab.

If the PSU is successfully installed, the status LED will show solid **green** color (if no other malfunction is encountered), then the Power Supply displays **green** box in the XEVO UI

**System -> Arrays.**

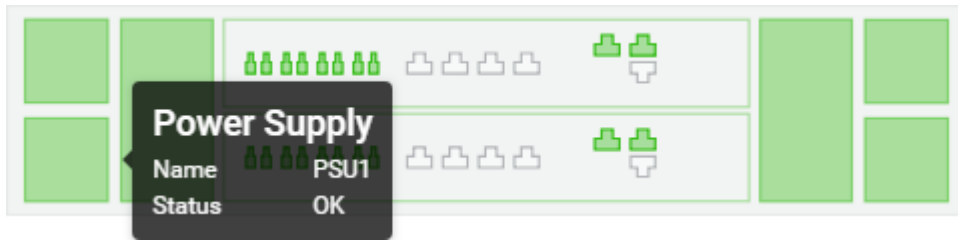


Figure 6-7 Screenshot of the PSU Successfully Installed in the XEVO UI

## 6.3. Removing / Installing the Fan Module

The standard XCubeFAS system comes with two redundant fan modules that allow you to hot swap it when one of the fan modules encounters an issue. In the event that the fan module fails, it can be hot-swapped. Please refer to the following information for the fan module removing / installing procedures.



## CAUTION:

The fan module is heavy; please use both hands while removing, holding, or carrying the fan module. The fan module is hot swappable, but power off the system to do the fan module installing or removing is highly recommended. Recommended place for installing / removing a fan module: the system is on the well secured rack or onto stable surface.

If you see the Fan Module showing **red** box in the XEVO UI **System -> Arrays**, that means your fan module has encountered an issue and needs to be immediately replaced. You need to follow the procedures below to remove problematic fan module and install a healthy one.

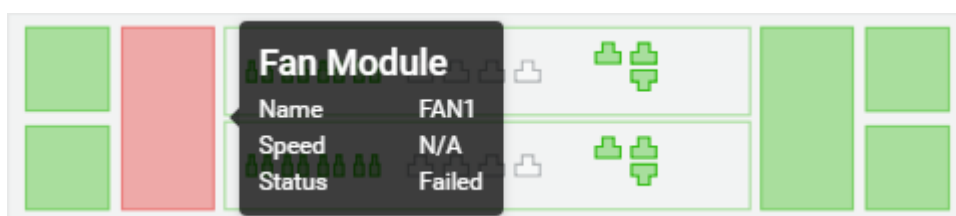


Figure 6-8 Warning Message of Failed Fan Module in the XEVO UI

## Removing the Fan Module

Figures below are fan modules for 4U/3U or 2U system chassis.

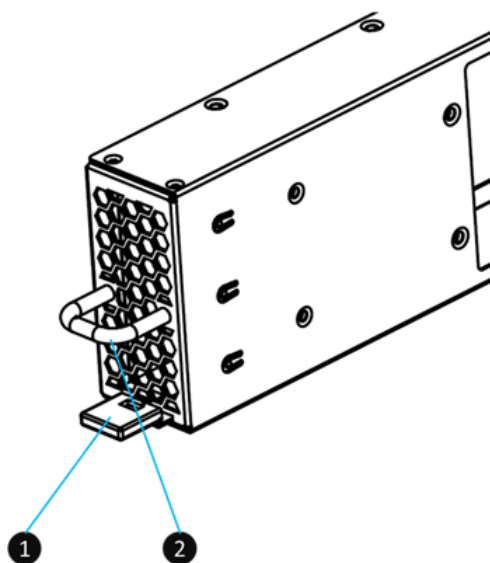


Figure 6-9 Mechanical Components of the Fan Module

Table 6-3 Mechanical Components of the Fan Module

Number	Description
1	The Fan Module Release Tab
2	The Fan Module Handle

The following details the steps of removing the fan module from the system chassis.

- Hold the fan module handle first, and then press the release tab.
- Pull out the fan module around half of the total fan module length.
- Use one hand to hold one end of the fan module (the side with release tab and handle) and the other hand hold the bottom of the module; pull out the module until it is free from the system chassis.

## Installing the Fan Module

The following details the steps of installing the fan module into the system chassis.

- Use one hand to hold one end of the fan module (the side with release tab and handle) and the other hand hold the bottom of the module; then align it with the empty slot. Installation direction of LFF and SFF systems is the same.
- Push the fan module all the way into the empty slot until hear the “click” sound from the release tab.

If the fan module is successfully installed, the Fan Module displays **green** box in the XEVO UI **System -> Arrays**.

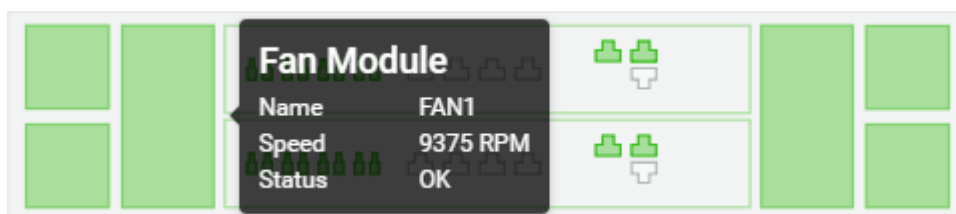


Figure 6-10 Screenshot of the Fan Module Successfully Installed in the XEVO UI

## 6.4. Removing the Host Card

If you encounter data connection problems from the host's side but you don't know which port or which host card is with problem, please go to XEVO UI -> **System -> Data Ports**, it will show all host cards you have installed. If the host card has fault, all of the ports will have a fault and will show as **Down**.

The following figure is the example of one port failed of the 10GbE iSCSI host card.

## 🔗 iSCSI Ports

	CTRL	Interface	Location	Port	Status	LAG	IP Address	Gateway
🟢	1	iSCSI (10GB) ⚙️	Onboard	LAN1	1 Gb/s	N/A	192.168.1.1	192.168.1.254
🟢	1	iSCSI (10GB) ⚙️	Onboard	LAN2	Down	N/A	192.168.2.1	192.168.2.254
🟢	2	iSCSI (10GB) ⚙️	Onboard	LAN1	1 Gb/s	N/A	192.168.11.1	192.168.11.254
🟢	2	iSCSI (10GB) ⚙️	Onboard	LAN2	Down	N/A	192.168.12.1	192.168.12.254

Figure 6-11 Example of a Failed Port on the 10GbE iSCSI Host Card

The following content and images are detailed steps of removing a host card from the system.

- Remove the controller module first. For detailed steps of removing a controller module; please refer to the chapter 6.1, [Removing / Installing the Controller Module](#) section.
- Press the host card release button and disconnect the host card with the connector in the controller cage.
- Pull the host card out until it is free from the controller cage.
- Install the substitute host card. The detailed steps of installing a host card; please refer to the chapter 3.3, [Installing the Optional Host Cards](#) section.
- Install the dummy host card cage in the empty host card slot and tighten two screws.
- Repeat the procedures above if there are other host cards need to be removed.
- To ensure the system cooling, please install all dummy host adapter card cages if host cards are removed.

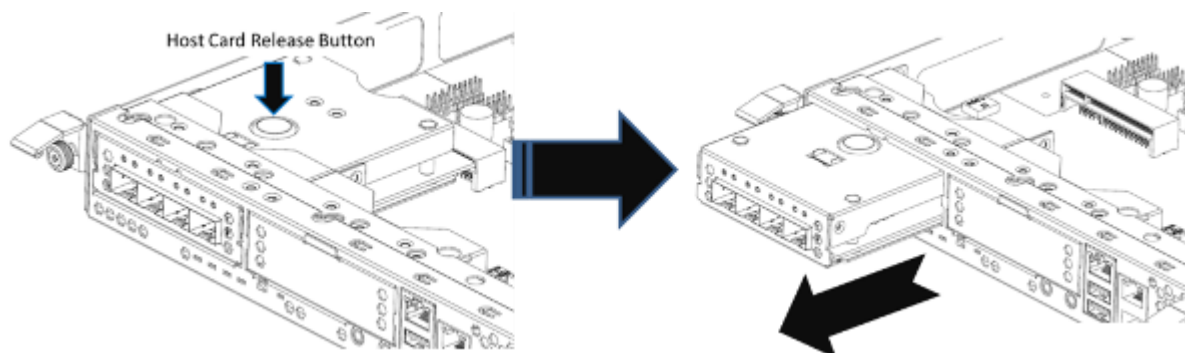


Figure 6-12 Procedures of Removing the Host Card from the Controller Cage

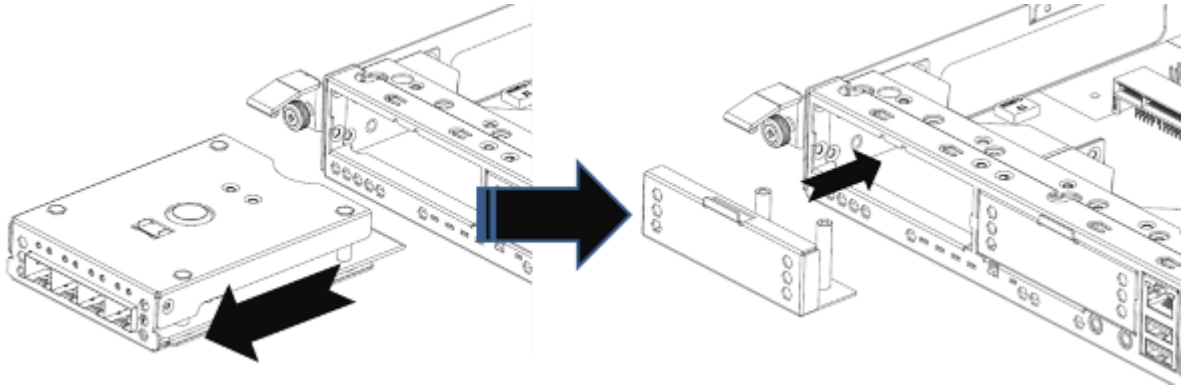


Figure 6-13 Procedures of Pull out the Host Card and Install Dummy Host Card Cage

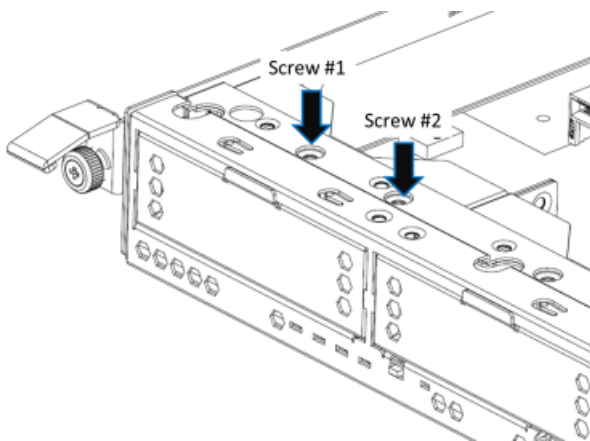


Figure 6-14 The Finished Installed Dummy Host Card Cage

## 6.5. Removing the Cache-to-Flash Modules

Navigate to the XEVO UI -> **System** -> **Arrays** and more over to the power module or flash module. If the status shows **Failed**, that means your power module or flash is not functioning correctly and can't provide real time data protection anymore. You may need to replace the power module or flash to ensure continued protection.

**CAUTION:**

The flash module of Cache-to-Flash is hot swappable because it is a PCIe device. Before removing the flash module from the system chassis, you must press the attention button until the flash module status LED finished blinking. Otherwise, the flash module maybe damage. For more information about Cache-to-Flash modules, please refer to the chapter 3.5, [Installing the Optional Cache-to-Flash Modules](#) section and the chapter 5.2.4, [Cache-to-Flash Module LEDs and Button](#) section.

The following content and image are detail steps of removing the flash module.

- Press the attention button of flash module until the flash module status LED is blinking. After blinking for a while, the LED will light off. At this point, you can safely remove the flash module.

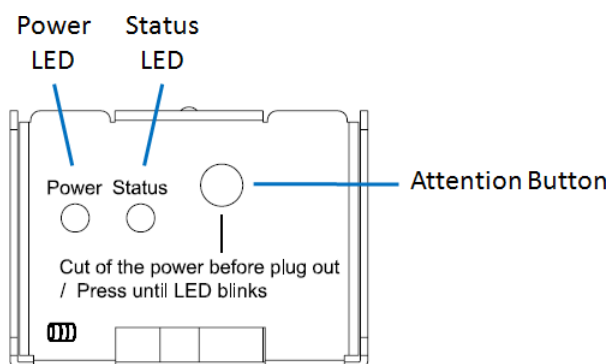


Figure 6-15 Pressing Attention Button of the Flash Module

- Press the release button of flash module and pull it out until it is free from system chassis.
- Install the substitute flash module. The detailed steps of installing the flash module, please refer to the chapter 3.5, [Installing the Optional Cache-to-Flash Modules](#) section.
- Install the dummy cache-to-flash cage and then use a Phillips screw driver to tighten it.

The following content and image are detail steps of removing the power module.

- Press the release button of power module and pull it out until it is free from system chassis.
- Install the dummy cache-to-flash cage and then use a Phillips screw driver to tighten it.

- To ensure proper cooling of the system, please install all dummy cache-to-flash module cages if the flash or power module is removed.

## 7. Support and Other Resources

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### 7.1. Getting Technical Support

After installing your device, locate the serial number on the sticker located on the side of the chassis or from the XEVO UI -> **MAINTINANCE** > **System Information** and use it to register your product at <https://partner.qsan.com/> (End-User Registration). We recommend registering your product in QSAN partner website for firmware updates, document download, and latest news in eDM. To contact QSAN Support, please use the following information.

- Via the Web: <https://qsan.com/support>
- Via Telephone: +886-2-7720-2118 extension 136  
(Service hours: 09:30 - 18:00, Monday - Friday, UTC+8)
- Via Skype Chat, Skype ID: qsan.support  
(Service hours: 09:30 - 02:00, Monday - Friday, UTC+8, Summer time: 09:30 - 01:00)
- Via Email: [support@qsan.com](mailto:support@qsan.com)

#### Information to Collect

- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages or capture screenshots
- Product-specific reports and logs
- Add-on products or components installed
- Third-party products or components installed

#### Information for Technical Support

The following system information is necessary for technical support, please refer to following for what and where to get the information of your XCubeFAS series model.

If the technical support requests you to download the Service Package, please navigate in the XEVO UI -> **SYSTEM SETTING** -> **Maintenance** -> **System Information**, and then click the **Download Service Package** button to download. Then the system will automatically generate a zip file the default download location of your web browser.


**System Information**



System Name	XF2026
Model Name	XF2026
Serial Number	QW2260160060201001
Controller Status	Normal
Master Controller	Controller 1

**Controller 1**

Serial Number	50013780080B3180
CPU	Intel(R) Xeon(R) Processor D-1500 4 Cores
Memory	32 GB
Host Card Slot 1	Empty
Host Card Slot 2	Empty
Firmware Ver	1.0.0
SAS IOC Firmware Ver	07.00.01.00
SAS Expander Firmware Ver	1000

**Controller 2**

Serial Number	50013780080B33C0
CPU	Intel(R) Xeon(R) Processor D-1500 4 Cores
Memory	32 GB
Host Card Slot 1	Empty
Host Card Slot 2	Empty
Firmware Ver	1.0.0
SAS IOC Firmware Ver	07.00.01.00
SAS Expander Firmware Ver	1000

**Backplane**

Backplane Serial Number	001378D601B0
Backplane ID	QW226
MCU Verion	1.2.1

[Download Service Package](#)

\* It will take a few moments to collect and download the system information for this array.

Figure 7-1 Download Service Package in the XEVO UI (X)

## 7.2. Online Customer Support

For better customer support, every XCubeFAS series models include the console cable (two for dual controller models), one for single controller models) for online support. Please follow the procedures below to setup the online help environment for QSAN support team.

The following procedure will help you to setup the serial console via the console cable that is enclosed in the shipping carton. The following image is the appearance of the console cable.



Figure 7-2 Appearance of a Console Cable

### Procedures to Setup the Serial Console

1. Setup the serial cable between the controller and one server/host like in the below image.

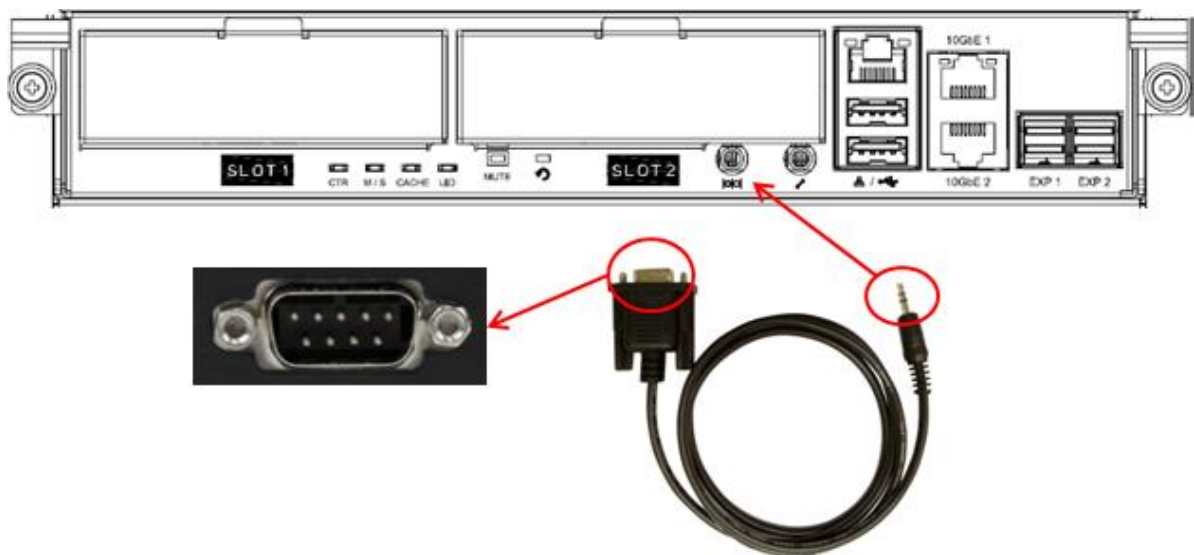


Figure 7-3 Connect the Console Cable

2. You must use terminal software such as HyperTerminal or Putty to open the console after the connection is made.

**INFORMATION:**

For more information about terminal software, please refer to

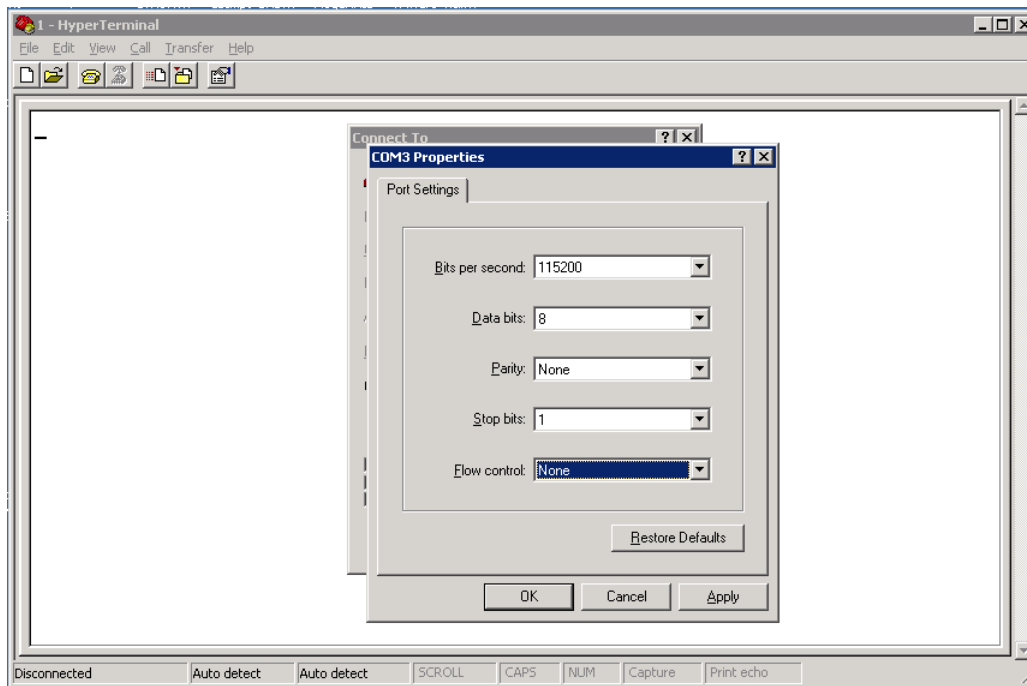
HyperTerminal: <http://www.hilgraeve.com/hyperterminal/>

PuTTY: <http://www.putty.org/>

3. Here we first demonstrate HyperTerminal. The console settings are on the following.

Baud rate: 115200, 8 data bit, no parity, 1 stop bit, and no flow control

Terminal type: vt100



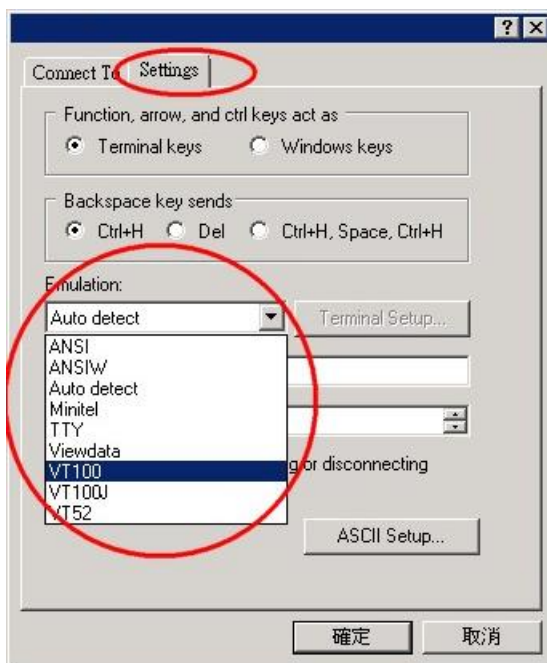
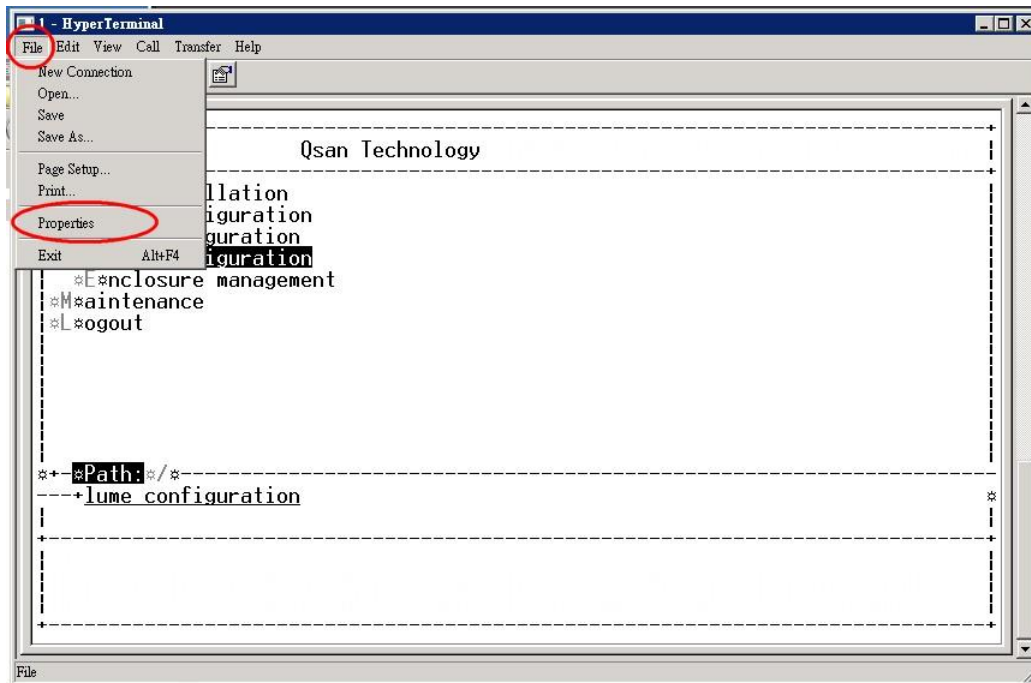
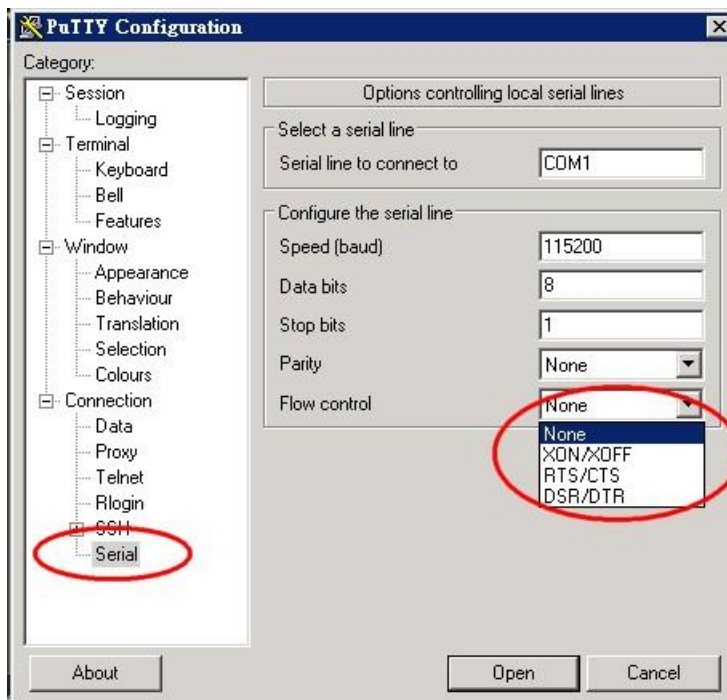
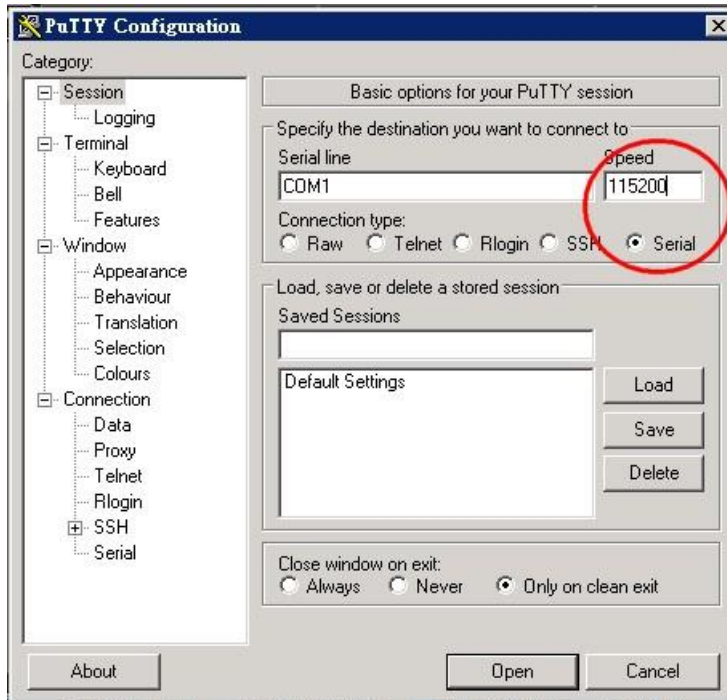


Figure 7-4 The Procedures of Setup Serial Console by HyperTerminal

4. If you are using PuTTY instead, please refer to below



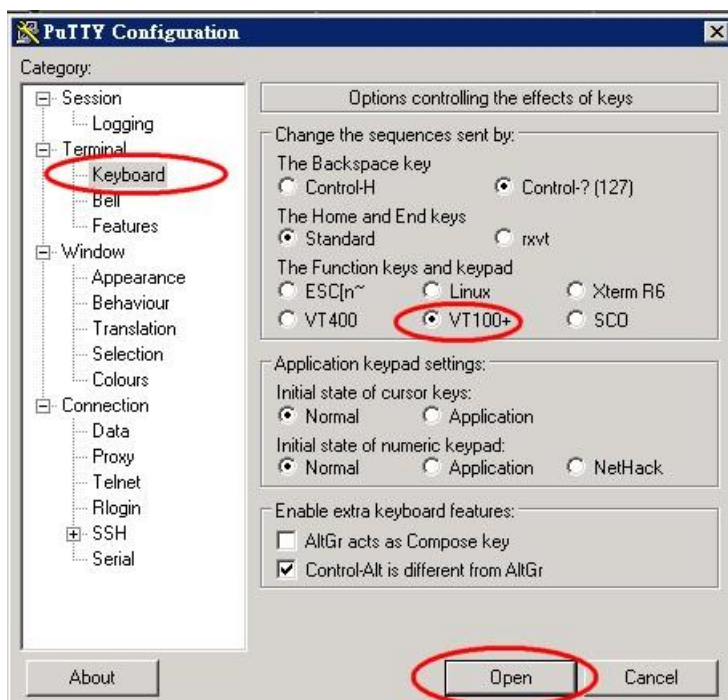


Figure 7-5 The Procedures of Setup Serial Console by PuTTY

5. Users should be able to login the controller system via console cable by following the procedures above.

### Setup the Connection for Online Support

Following is the procedure to setup the connection for online support via TeamViewer:

1. Please download the TeamViewer from following hyper link:  
<https://www.teamviewer.com/en/download/>
2. Install TeamViewer.
3. Please provide the ID/password showed on the application to QSAN support team member to join the online support session.

## 7.3. Accessing Product Updates

To download product updates, please visit QSAN website:

<https://qsan.com/download>

## 7.4. Documentation Feedback

QSAN is committed to providing documentation that meets and exceeds your expectations. To help us improve the documentation, email any errors, suggestions, or comments to [docsfeedback@qsan.com](mailto:docsfeedback@qsan.com).

When submitting your feedback, include the document title, part number, revision, and publication date located on the front cover of the document.

# Appendix

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