QSAN Official Document

XCubeDAS 5300

Hardware Manual

July 2024

ANNOUNCEMENT

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This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

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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

(EN55032 / EN55035)

UL Statement

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

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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).



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.

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°C ~ 35°C (32°F ~ 95°F); operation rating (100-127 Vac, 50-60Hz, 10.0A; 200-240 Vac, 50-60Hz, 5.0A)

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CAUTION

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 REMPLACEE PAR UNE BATTERIE DE TYPE INCORRECT. METTRE AU REBUT LES BATTERIES USAGEES CONFORMEMENT AUX INSTRUCTIONS.

VORSICHT: (German)

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

ADVERTENCIA: (Spanish)

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

ВНИМАНИЕ: (Russian)

Опасность взрыва при замене батареи неправильного типа. Пожалуйста, устанавливайте на место батареи такого же или аналогичного типа и утилизировайте использованные батареи в соответствии с инструкциями.

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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警告: (Simplified Chinese)

电池如果更换不正确会有爆炸的危险，请依制造商说明处理用过之电池。



CAUTION

Replacing incorrect type of battery will have the risk of explosion. Please replace the same or equivalent type battery use and dispose of used batteries according to the instructions.



CAUTION RESTRICTED ACCESS LOCATION

This system is intended for installation only in restricted access locations as defined where both these conditions apply:

- Access can only be gained by 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.

Warning

- Electric shock hazard



The system may have one or more power supply unit (PSU) cords. To avoid serious injuries, it is recommended that all PSU power cords must be disconnected by trained service technicians before installing or replacing system components.

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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://www.qsan.com/warranty

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PREFACE

About This Manual

This manual provides technical guidance for designing and implementing QSAN XCubeDAS series expansion units, and it is intended for use by system administrators, 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.

- Quick Installation Guide
- CLI User's Manual
- Compatibility Matrix
- White Papers
- Application Notes

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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://www.qsan.com/technical_support
- Via Telephone: +886-2-77206355
- (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

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.

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Conventions

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

CONVENTIONS	DESCRIPTION
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click the **OK** button.
<Italic>	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: [a | b]

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1. PRODUCT OVERVIEW

Thank you for purchasing QSAN Technology, Inc. products. QSAN XCubeDAS XD5300 Series is a DAS (Direct Attached Storage) or JBOD (Just a Bunch Of Disks) for server expansion. It is also a RAID expansion enclosure for QSAN storage.

1.1. Introduction to XCubeDAS Series

QSAN XCubeDAS series is a DAS storage system, the system is fully compatible with all major 12 Gb/s SAS host cards, RAID controller cards, servers, and operating system. The system hardware is a modular design for FRU (field replacement unit). All the hardware modules are inside the rack mount chassis including system controller module, front panel, rear panel, redundant power supply, and fan module. This manual will direct you step by step to familiarize you with the hardware components, how to install the system, carry out the initial configure, and provide you with some quick maintenance guidelines.



INFORMATION

For how to use the CLI (Command Line Interface), please refer to the CLI User's Manual.

XCubeDAS series supports several standard form factors:

- LFF (Large Form Factor): 24-bay 19” rack mount 4U chassis, 16-bay 19” rack mount 3U chassis, and 12-bay 19” rack mount 2U chassis.
- SFF (Small Form Factor): 26-bay 19” rack mount 2U chassis.

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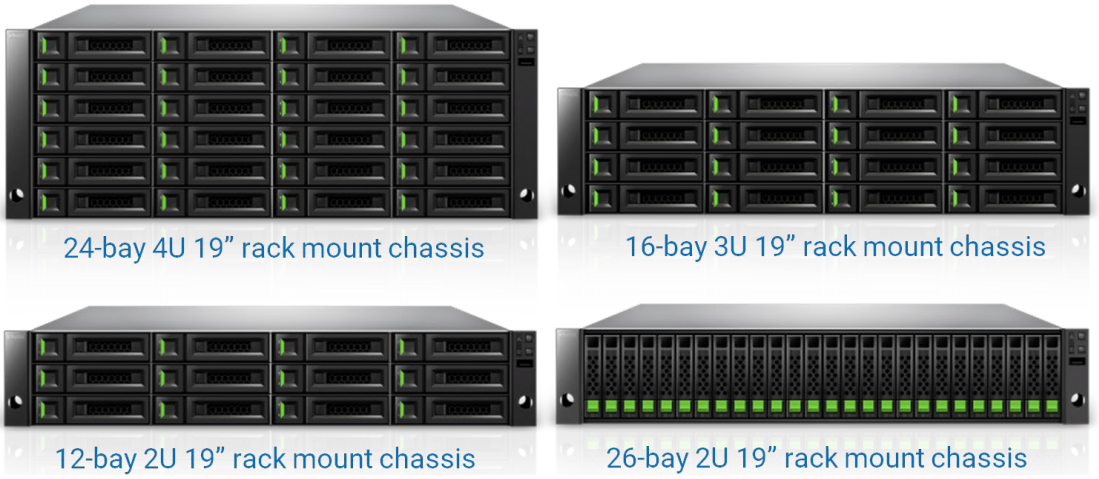


Figure 1-1 XCubeDAS Series Form Factors

The following tables provide detailed information about all XCubeDAS series models arranged by form factors.

Table 1-1 XCubeDAS Series Models

MODEL NAME	CONTROLLER TYPE	FORM FACTOR, BAY COUNT, RACK UNIT
XD5324D	Dual Controller	LFF 24-bay 4U Chassis
XD5324S	Single Controller	LFF 24-bay 4U Chassis
XD5316D	Dual Controller	LFF 16-bay 3U Chassis
XD5316S	Single Controller	LFF 16-bay 3U Chassis
XD5312D	Dual Controller	LFF 12-bay 2U Chassis
XD5312S	Single Controller	LFF 12-bay 2U Chassis
XD5326D	Dual Controller	SFF 26-bay 2U Chassis
XD5326S	Single Controller	SFF 26-bay 2U Chassis

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1.2. Hardware Specifications

For detailed hardware specifications, please refer to the XD5300 Datasheets which can be downloaded from the website.

1.3. Package Contents

For detailed package contents, please refer to the Quick Installation Guide which can be downloaded from the website.

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2. Overview of System Components

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

2.1. Front Panel

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

2.1.1. System Controls and Indicators

The XCubeDAS series features a unique design: the system controls and indicators are located on the right ear. The system control and indicator module integrate functional buttons and system state indicators, which can be easily operated and read by user. The figure below takes the XD5326 as an example, and contains detailed of the button and indicator module. Please refer to the following for the definition of LED behavior.

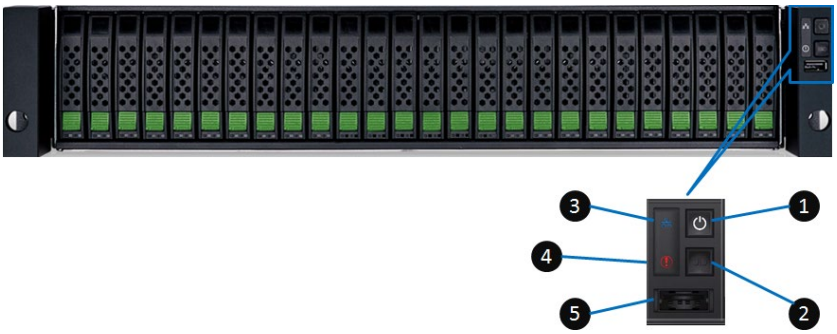


Figure 2-1 System Controls and Indicators

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Table 2-1 System Control and Indicator Descriptions

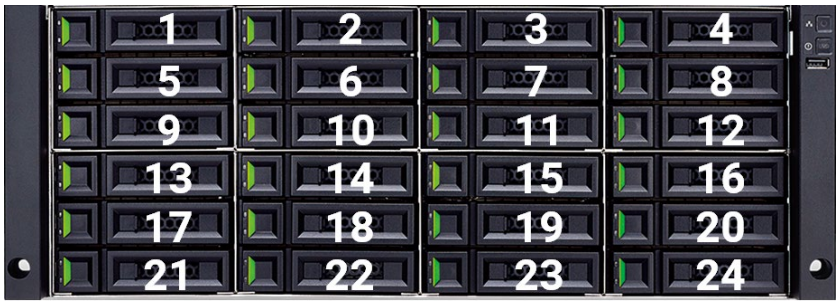
NUMBER	DESCRIPTION	DEFINITION
1	Enclosure Power Button / LED	Power Button • Press the button one time to turn ON the system power and keep pressing for 4 seconds to turn OFF the system power. Power LED • Solid White: Power is ON (at least one power supply unit is supplying power to the system). • Blinking White: The system is in the stage of boot or shutdown. • Off: The system is shutdown.
2	UID Button / LED	UID (Unique Identifier) button • Press the button one time to turn it ON and press it again to turn it OFF. UID (Unique Identifier) LED • Solid Blue: The system has been identified. • Off: The system has not been identified.
3	Enclosure Access LED	Enclosure Access LED indicates the host interface connectivity. • Blinking Blue: The host interface activity is on-going. • Off: There is no host interface activity.
4	Enclosure Status LED	Enclosure Status LED indicates current health status of the system. • Solid Amber: System has errors including PSU failure, abnormal voltage, abnormal temperature, any fan module failed or removed, controller degraded, pool

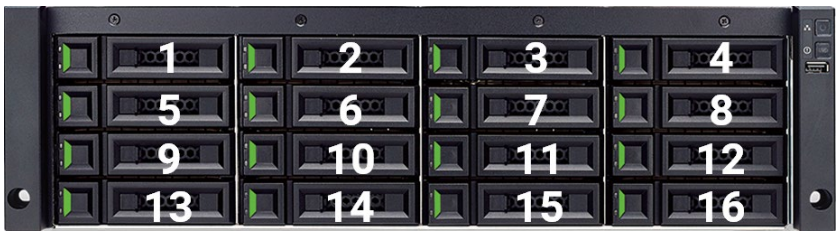
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		degraded, pool failure, SSD cache pool degraded, or SSD cache pool failure. • Off: The system is healthy.
5	USB Port	The USB port can be plug in the LCM (LCD Module).

2.1.2. System Disk Drive Numbering

Figures below illustrate the XCubeDAS system disk drive numbering. The disk drive numbering for LFF system starts from the top of first row in left column; this kind of disk drive numbering rule helps to balance the system weight distribution and enable easy management of disk drives zoning. 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 LFF, you can find a disk drive numbering sticker on the right side of the system chassis top cover; for SFF system, the disk drive numbering is printed on the lower part of the system front.







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Figure 2-2 Disk Drive Numbering

TIP

Please insert any one of the first four hard drives, the event log can be saved and displayed at the next system startup. Otherwise, the event log cannot be saved.

2.1.3. Disk Drive LEDs

Please refer to the following for the definition of LED behavior.

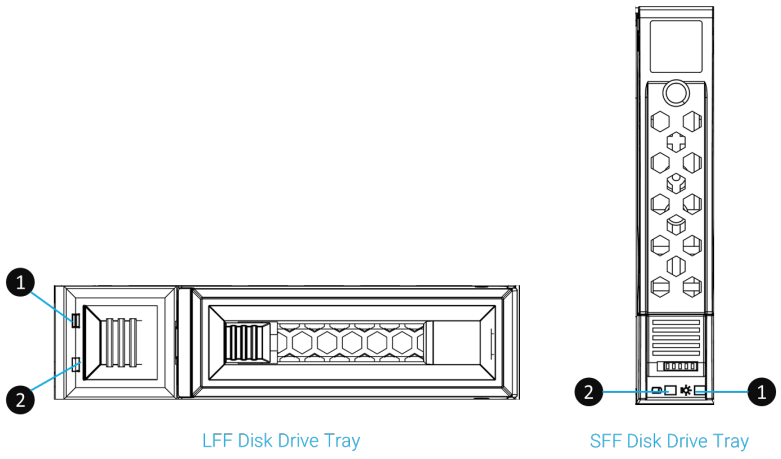


Figure 2-3 Disk Drive Indicators

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Table 2-2 Disk Drive Indicator Description

NUMBER	DESCRIPTION	DEFINITION
1	Disk Drive Power LED	• Solid Blue: The disk drive is inserted and no data access. • Blinking Blue: The disk drive is accessing data. • Off: There is no disk drive inserted.
2	Disk Drive Status LED	• Solid Amber: ▪ When system is booting. ▪ There is disk drive error. • Blinking Amber (interval of 0.5 sec): The disk drive is rebuilding. • Blinking Amber (interval of 0.05 sec): Identify the disk drive. • Off: The disk drive is healthy.

2.2. Rear Panel

In this section, we will describe the name and location of the key components and modules in the rear panel. The following content outlines the detail of the rear panel and components.

2.2.1. Rear Panel Layout

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

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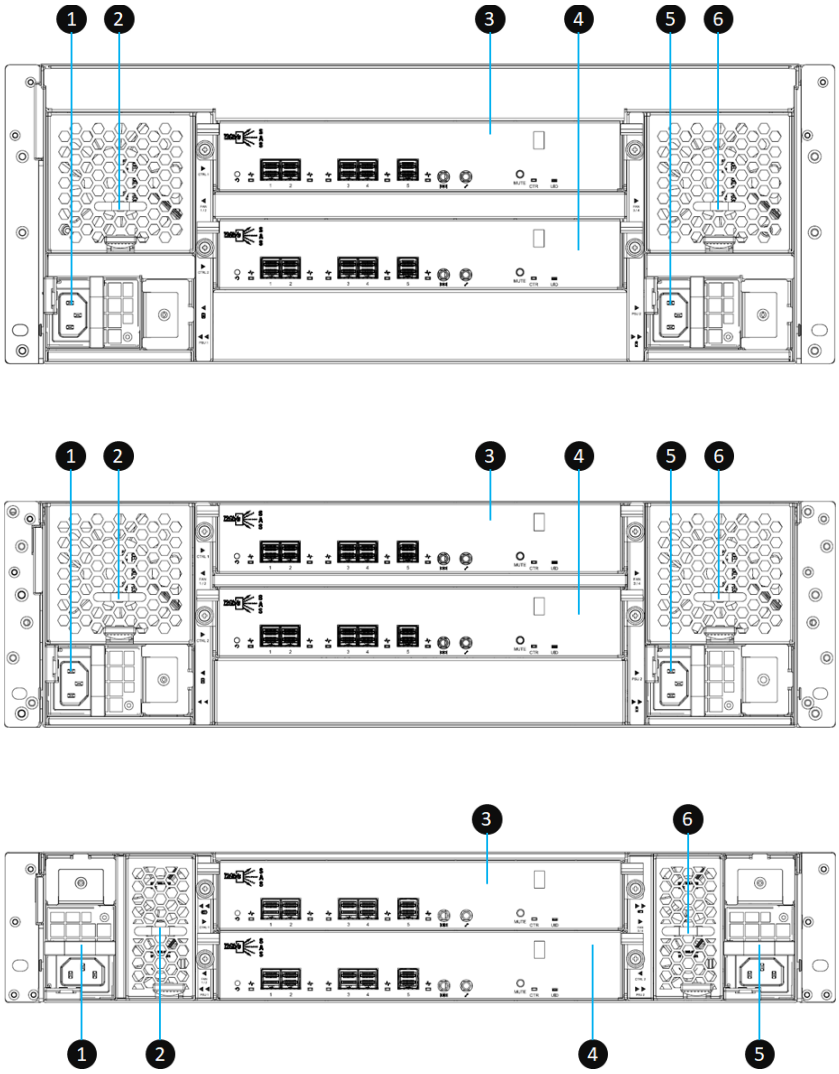


Figure 2-4 Rear Panel Layout

Table 2-3 Rear Panel Layout Description

ITEM NUMBER	DESCRIPTION
1	Power Supply Unit 1
2	Fan Module 1
3	Controller Module 1
4	Controller Module 2

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5	Power Supply Unit 2
6	Fan Module 2

2.2.2. Controller Module

The following image and table illustrate each component of a controller module.

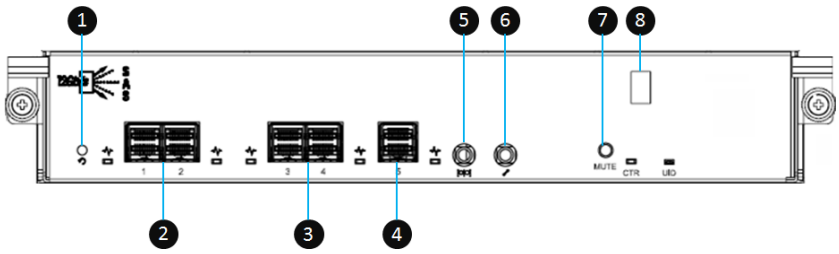


Figure 2-5 Controller Module Components

Table 2-4 Controller Module Component Description

ITEM NUMBER	DESCRIPTION
1	Reset to Factory Default Button
2	12 Gb/s SAS Wide Port 1 & 2 (SFF8644)
3	12 Gb/s SAS Wide Port 3 & 4 (SFF8644)
4	12 Gb/s SAS Wide Port 5 (SFF8644)
5	Console Port (3.5mm jack to RS232)[1]
6	Service Port (UPS)[2]
7	Buzzer Mute Button
8	Seven-segment LED Display

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[1] *Console cable (NULL modem cable) connects 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.*

[2] *Reserved.*

2.3. Power Supply Units

The system is equipped with two redundant and hot swappable PSUs (Power Supply Units). The images and the table below illustrate the location of PSUs in the system.

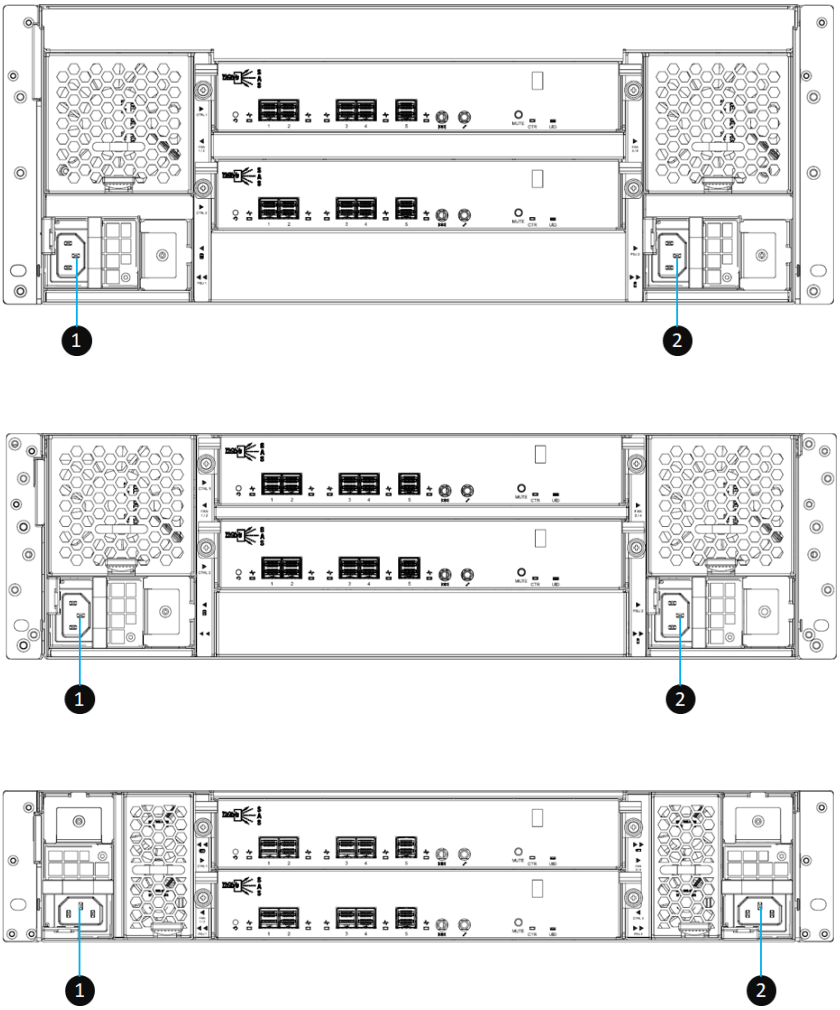


Figure 2-6 Power Supply Unit Location

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Table 2-5 Power Supply Unit Location Description

ITEM NUMBER	DESCRIPTION
1	PSU 1
2	PSU 2

Please refer to the following for the definition of component and LED behavior.

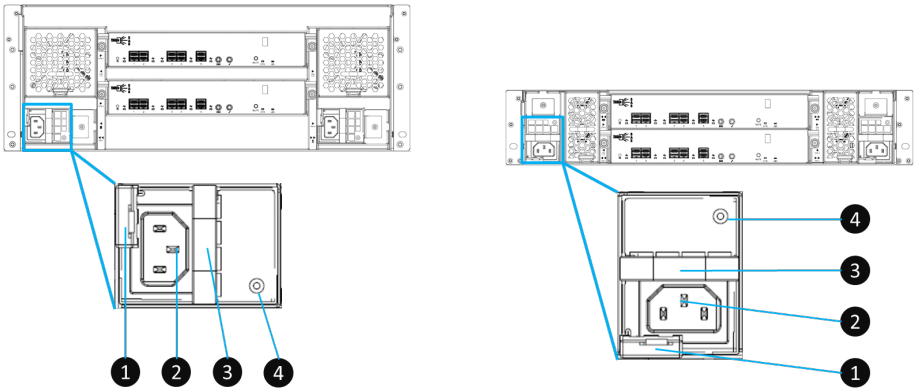


Figure 2-7 Power Supply Unit Components

Table 2-6 Power Supply Unit Component Description

ITEM NUMBER	DESCRIPTION
1	PSU Release Tab
2	PSU Power Cord Connect
3	PSU Handle
4	PSU LED Indicator

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Table 2-7 Power Supply Unit LED Description

NUMBER	DESCRIPTION	DEFINITION
4	PSU LED	• Solid Green: The PSU is on and normal. • Blinking Green: The PSU is off, +5VSB (Standby) is on. • Solid Amber: There is critical event caused shutdown. • Blinking Amber: There are PSU warning events including high temperature, high power, high current, slow fan, or under input voltage.

2.4. Fan Modules

The system is 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 system.



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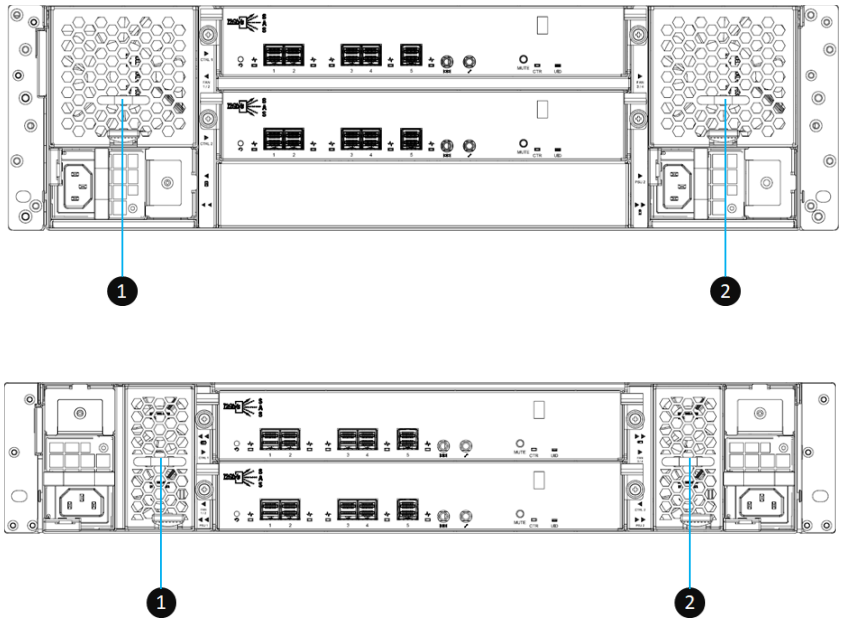


Figure 2-8 Fan Module Location

Table 2-8 Fan Module Location Description

ITEM NUMBER	DESCRIPTION
1	Fan 1 and Fan 2
2	Fan 3 and Fan 4

Please refer to the following for the definition of component.

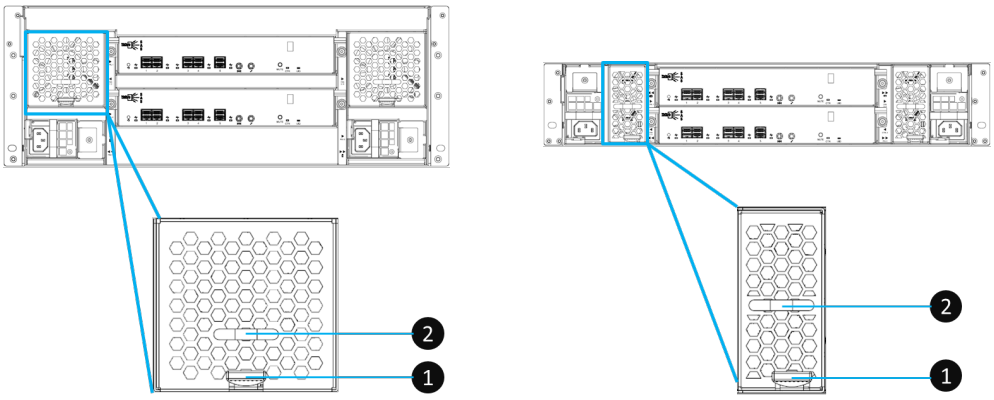


Figure 2-9 Fan Module Components

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Table 2-9 Fan Module Component Description

ITEM NUMBER	DESCRIPTION
1	Fan Module Release Tab
2	Fan Module Handle

2.5. Seven-segment LED Display

The XD5300 series features the seven-segment LED display for users to easily identify a specific XCubeDAS system. The enclosure ID is assigned by head unit automatically. The seven-segment LED display supports up to ten XCubeDAS systems, and the numbering rule will start from 1 to A. For dual controller models, both controllers will display the same enclosure ID. After the XD5300 had been assigned the enclosure ID, head unit will assign the same enclosure ID when the system reboots or goes shutdown. These enclosure IDs can be clean and reset if you execute the Clean Expansion ID function. Please refer to the XEVO Software Manual or QSM Software Manual.

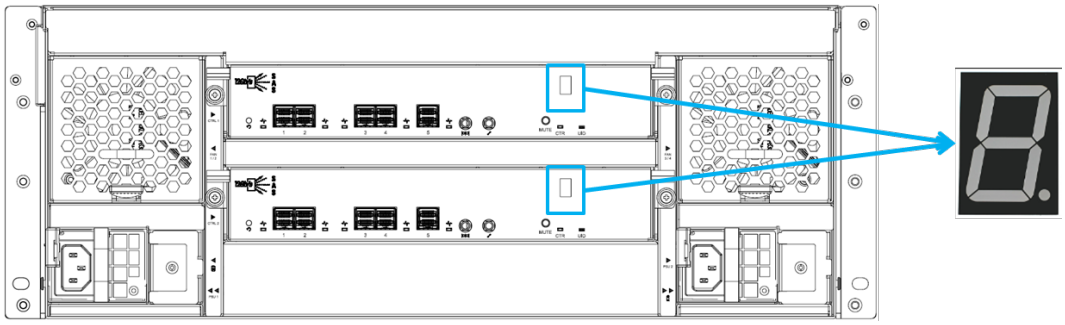


Figure 2-10 Seven-segment LED Display

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3. SUPPORT AND OTHER RESOURCES

3.1. Getting Technical Support

After installing your device, locate the serial number on the sticker located on the side of the chassis and use it to register your product at https://www.qsan.com/business_partnership. 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://www.qsan.com/technical_support
- Via Telephone: +886-2-77206355
- (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

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

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3.2. Documentation Feedback

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APPENDIX

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