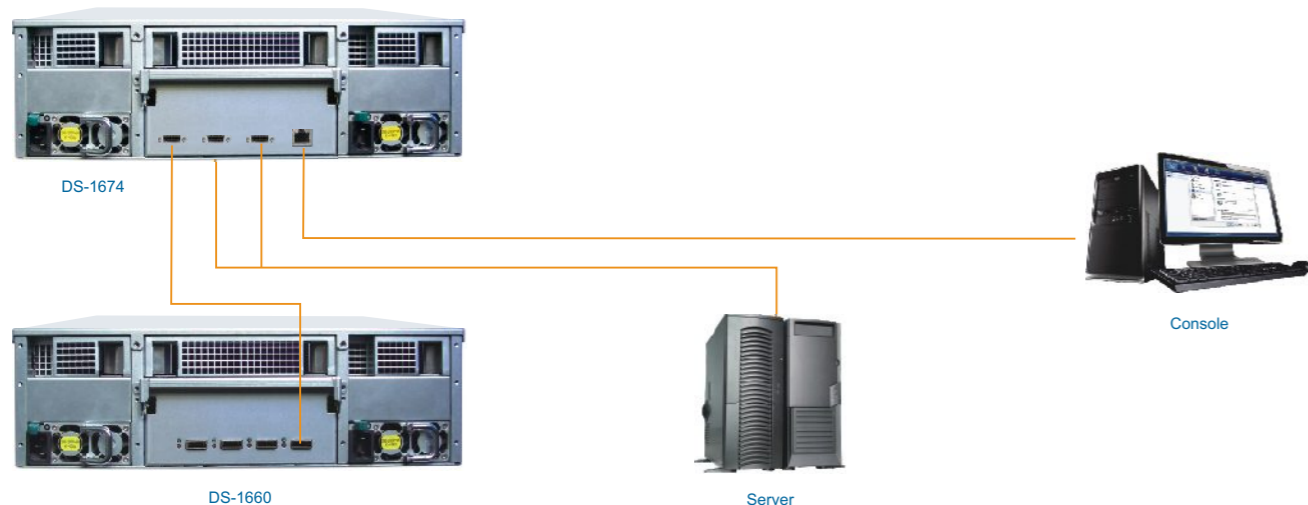


## DS-1674 MINI SAS Storage System

DS-1674 is a storage system based on MINI SAS technology. It is equipped with Intel i80341 processor and two SAS ports, supporting both single-channel connection and redundant connection which provides up to 24Gbps bandwidth. With one SAS JBOD expansion connector, it can be connected to up to 80 SAS/SATA HDD under RAID mode.



# NORCO

## DS-1600 Series Modular Intelligent Storage Systems

### Specifications :

Mode	DS-1674		
CPU	Intel i80341	Front-panel LCD and buttons	To configure and inspect the status of the system
Cache	512MB~2048MB DDR RAM	RS-232	To configure and inspect the status of the system
HDD Connector	SAS/SATA II	GUI	Via internal Ethernet connection, based on Web browsing
HDD Channels	16 (MAX. 80, with SAS JBOD expansion)	Event report	LCD, internal beeper, Email and SNMP
Hot-Swappable HDD bays	16 x 3.5" HDD	Pathguard software	Multiple-path management, switch and recovery, dynamic I/O balancing
Hot-Swappable Power Unit	Supported	Relative Humidity	10% ~ 80% non-condensing
AC Voltage	100 to 240V (+/-10%), 47 to 63 Hz	Operating Temperature	5°C~40°C
BBU	1	Storage Temperature	-25°C~60°C
Hot-Swappable Fans	3 x turbo fans(3,600 rpm)	Certificates	UL, CUL, CB
Controller port	1	EMC	FCC, CE, C-Tick, BSMI
Host ports	Mini SAS	Dimensions	485mm x 574mm x 132mm(WxDxH)
Bandwidth	12Gbps	Net Weight	24Kgs (w/o HDD)
Host channels	2	Package Dimensions	610mm x 790mm x 450mm(WxDxH)
RAID levels	JBOD, 0, 1, 0+1, 3, 5, 30, 50, 6, NRAID	Gross Weight	33Kgs (w/o HDD)
RAID groups	Max. 16		
DATA reconstruction	Automatic reconstruction		
RAID feature support	Global/dedicated hot spare, multiple host ID, multiple RAID VG, multiple UDV, foreground/background initialize, array roaming		
Software backup	Optional		
Snapshot	Yes		



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## DS-1600 Series Product Introduction:



NORCO has launched the latest 16-bays storage production-- DS-1600 series. This product is consisting of scalable chassis and controller modules.

The chassis of DS-1600 includes the case, power module, fan module, backplane, LCM and HDD hot swapable bay except the controller.

The controllers of DS-1600 is LIB-16XX. LIB-16XX has many different configurations of controller modules. DS-1600 can provide the customers with SAS Expand, SATA Expand, SAS to JBOD, Fibre to SAS, iSCSI to SAS and iSCSI to SATA etc storage solutions using different controllers.

DS-1600 has a curved and sleek design with modern and elegant appearance. It is 3U rackmounted with 16 swapable HDD bays.

With modular design and distinct wire-free connection, DS-1600 distinguishes itself as a very reliable un-compromised solution for mission-critical applications.

DS-1600 has the modules with different configurations and specifications. Owing to the flexibility and scalability of DS-1600, different levels of applications would find DS-1600 be suitable and adequate for their needs on a scalable and easy-to-use modulized platform.

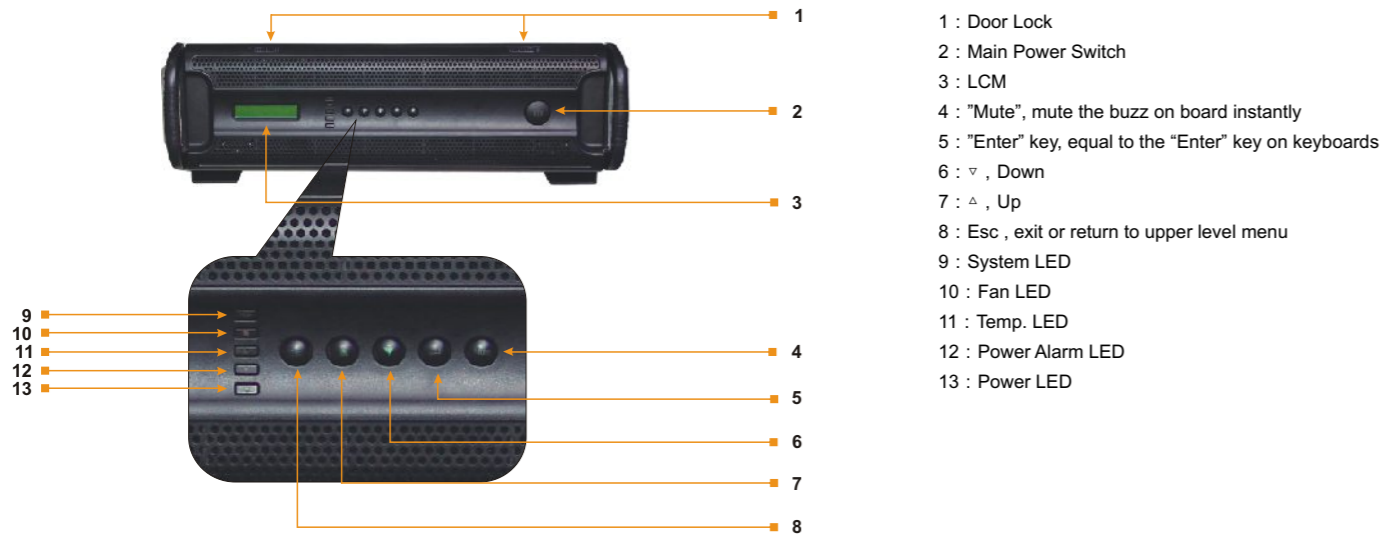
The front panel has a non selflock power switch. The LCD displays real-time system temp./fan speed/power voltage status. Coordinate with different controller, DS-1600 can set the IP/RAID and RAID restore. The dual powersupply module is designed to balance the workload with redundant function.

This series of products are featuring the intelligent adjustment of fan and temp. With very silent working mode, this series is also suitable for desktop applications.

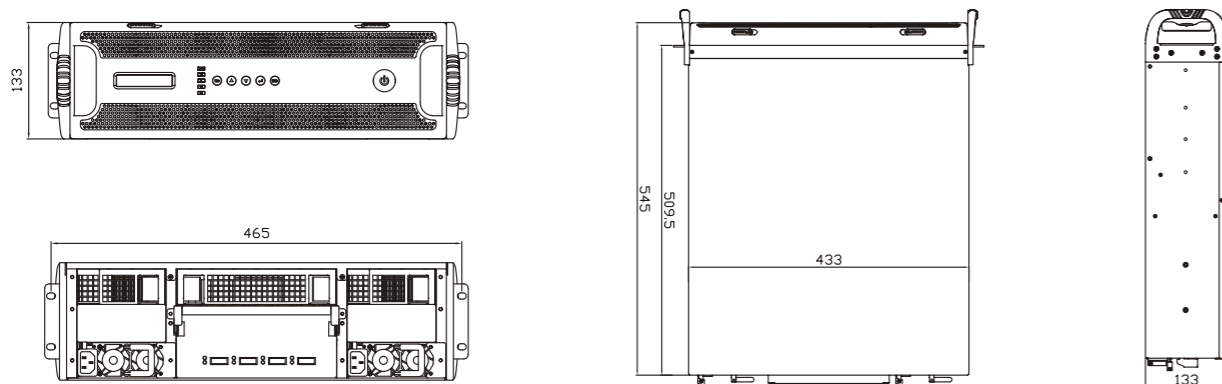
The three 1U cooling fan module can change the fan speed according to the different temperature of different areas inside to maintain a good system ventilation character.

This series is very suitable for infrastructure applications for enterprises, i.e. Large-scale database applications, data-intensive applications, video editing, medical imaging, high-bandwidth storage solutions, DVR storage, data centralized storage, file servers, remote disaster recovery storage, external directly storage solutions.

## DS-1600 Series Products Front Panel Interface Outline:



## DS-1600 Dimensions(mm):



## DS-1600 Product Features:



### High Reliability Data Protection

DS-1600 is also featuring the dual power load-balancing technology.

DS-1600 has a redundant system consisting of selectable components such as powersupply and fan, which brings an enhanced reliability to the whole system. If there is one powersupply fails, the other one will take up the workload instantly to ensure the safety of the system.

The HDDs are powered and detected in several batches to reduce the electricity punch.



### Massive Storage

DS-1600 series storage products provide 16 hot swapable HDD per unit. The HDD bay supports all kinds of SAS and SATA HDDs.

Different controllers are designed to meet different requirements, and the most capable controller can support upto 256 HDDs for masisve storage solutions.



### Realtime Detection and debugging

DS-1600 can detect the modules of PS, voltage, temperature and fan speed on a reatime basis. If there is any exception, the system will send an alert



### Agile installation method

The sides of the host chassis have the screw eyes for sliding rails. DS-1600 can be easily installed to the racks with the sliding rails. With 3U standard structure, the DS-1600 can be installed as the rackmounted unit(with rails or screws) or desktop applications(with racks).



### Modulized and easy-to-maintainance

DS-1600 series is featuring the most outstanding selling point as a modulized product. The PS, fan, controller and storage units are independent modules.

The inside of the chassis has the hot swapable fan, powersupply, and controller, hotswapable HDD bays without wire connection(only circuit connection), it is very convenient and comfortable for installation and maintenance. The respective modules are connected by high reliability connectors, and, especially, the controllers use VHDM connectors dedicated for high speed signals.



### LCM Management

LED displays the status of fan, temp., voltage, powersupply and other alert etc. It supports easy to use RAID settings and IP settings configurations.



### High Intelligence

DS-1600 can intelligently adjust the temperature and fan speed in order to extending the fan lifespan and ensure chassis cooling while keeping the noise level to be low.



### Quiet Mode

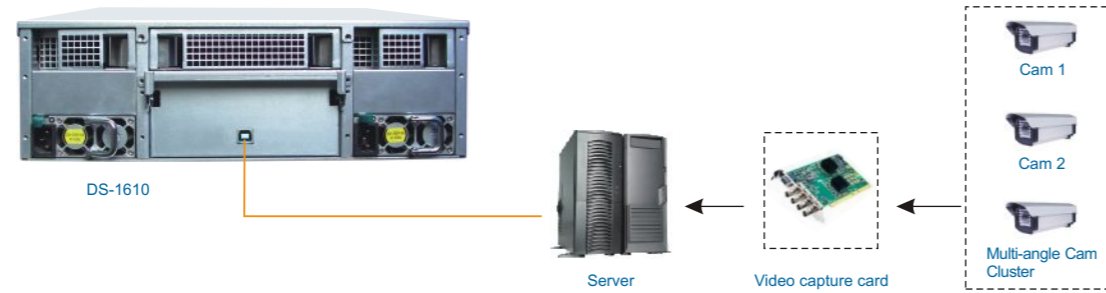
DS-1600 has a quiet mode for desktop users. If the system enters into the quiet mode, the system will be run in a very silent manner. In case the temperature or workload is increasing to the preset level, the system will run in normal status automatically to ensure the safety and performance of the whole system.

# Specifications compare of DS-1600 series:

Model	DS-1610	DS-1620	DS-1630	DS-1660		DS-1671	DS-1672	DS-1673	DS-1674	
<b>Interface</b>	USB to SATA	SAS to SATA	SAS to SATA	SAS to SAS/SATA		iSCSI to SAS/SATA	iSCSI to SATA	Fibre to SAS/SATA	SAS to SAS/SATA	
<b>Host Interface</b>	1x USB-B	1x Mini SAS	2x GbE	2x Mini SAS		4x iSCSI GbE	2x iSCSI GbE	2x Fibre Channel	2x Mini SAS	
<b>Backplane Interface</b>	SATA	SATA	SATA	SAS/SATA		SAS/SATA	SATA	SAS/SATA	SAS/SATA	
<b>HDD Quantity</b>	16	16	16	16		16	16	16	16	
<b>RAID Level</b>	(Not Supported)	By RAID Controller	RAID 0,RAID 1,RAID 5	By RAID Controller		Up to RAID 60	Up to RAID 60	Up to RAID 60	Up to RAID 60	
<b>JBOD Expansion</b>	NO	NO	NO	YES		YES	NO	YES	YES	
<b>Max HDD Q'ty</b>	16	16	16	256		80	16	80	80	
<b>Processor</b>	--	--	Pineview	V3000		IOP 342	IOP 341	IOP 341	IOP 341	
<b>Memory</b>	--	--	512MB~2GB/DDR2 667	Embedded RAM		1GB~2GB/DDR2 533	512MB~2GB/DDR2 533	512MB~2GB/DDR2 533	1GB~2GB/DDR2 533	
<b>Redundant Power</b>	2x 300W as the default, with 2x 600W optional					2x 300W as the default, with 2x 600W optional				
<b>Units</b>	Support	Support	Support	Support		Support	Support	Support	Support	
<b>Temp. fan and power</b>	--	By RAID Controller	--	By RAID Controller		120K	45K	70K	--	
<b>IOPS</b>	480Mb/s	1200MB/s	200MB/s	2400MB/s		600MB/s	200MB/s	800MB/s	1GB/s (SAS) 700MB/s(SATA)	

## DS-1610 USB Storage System

Single USB connection to the host, supporting any PC with USB 2.0 ports (compliant with USB 1.1 standards), allows up to 480MB/s bandwidth. This model is suitable for those who do not need high speed data transfer rate.

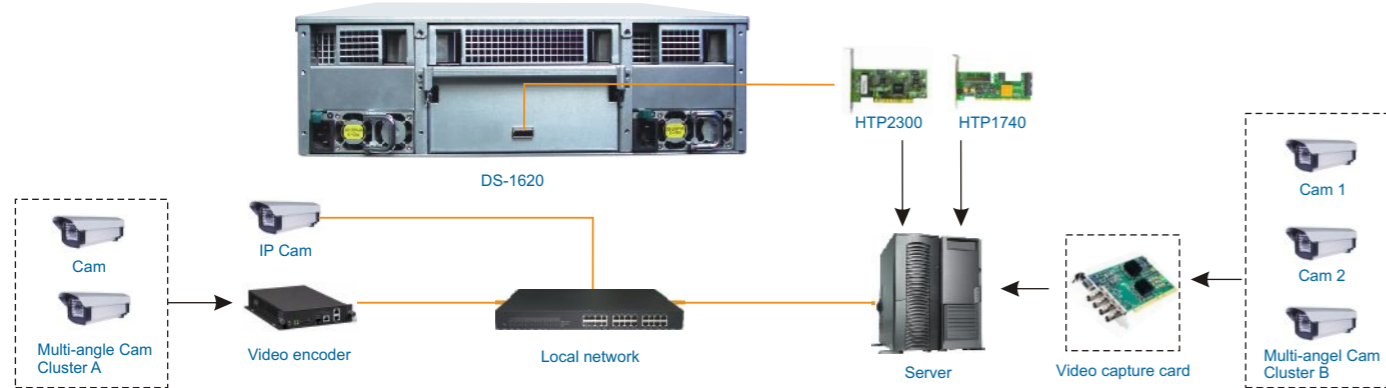


### Specifications :

Mode	DS-1610		
Rack-mount	3U	Power Units	2x 300W as the default, with 2x 600W optional
HDD interface	SATA	Intelligent Adjustment	Temperature, fan speed and power supply
HDD support	3.5"	Feature	16-bay SATA storage system
RAID support	No	Fan module	3x 1U turbo fans
Host interface	1x USB2.0	Control and indicators	System alarm, status indicators (power, voltage, fan and temperature), system reset
Backplane interface	SATA	Operation condition	Temperature range is up to the HDD. Relative humidity is within 0 ~ 90%, non-condensing.
Number of HDD	16	Storage condition	Temperature -40~ 85°C,relative humidity 0~90%,non condensing
JBOD expansion	No	Dimensions	433mm x 550mm x 133mm (WxDxH)
Max. Number of HDD	16		
Data Transfer Rate	480Mb/s		

## DS-1620 PM Storage System

With PM technology, DS-1620 can be connected to the host via single Mini-SAS cable, supporting 16 SATA hard disks, with maximum bandwidth of 12Gbps. It is the most cost-effective solution for customers who require a decent data transfer rate.



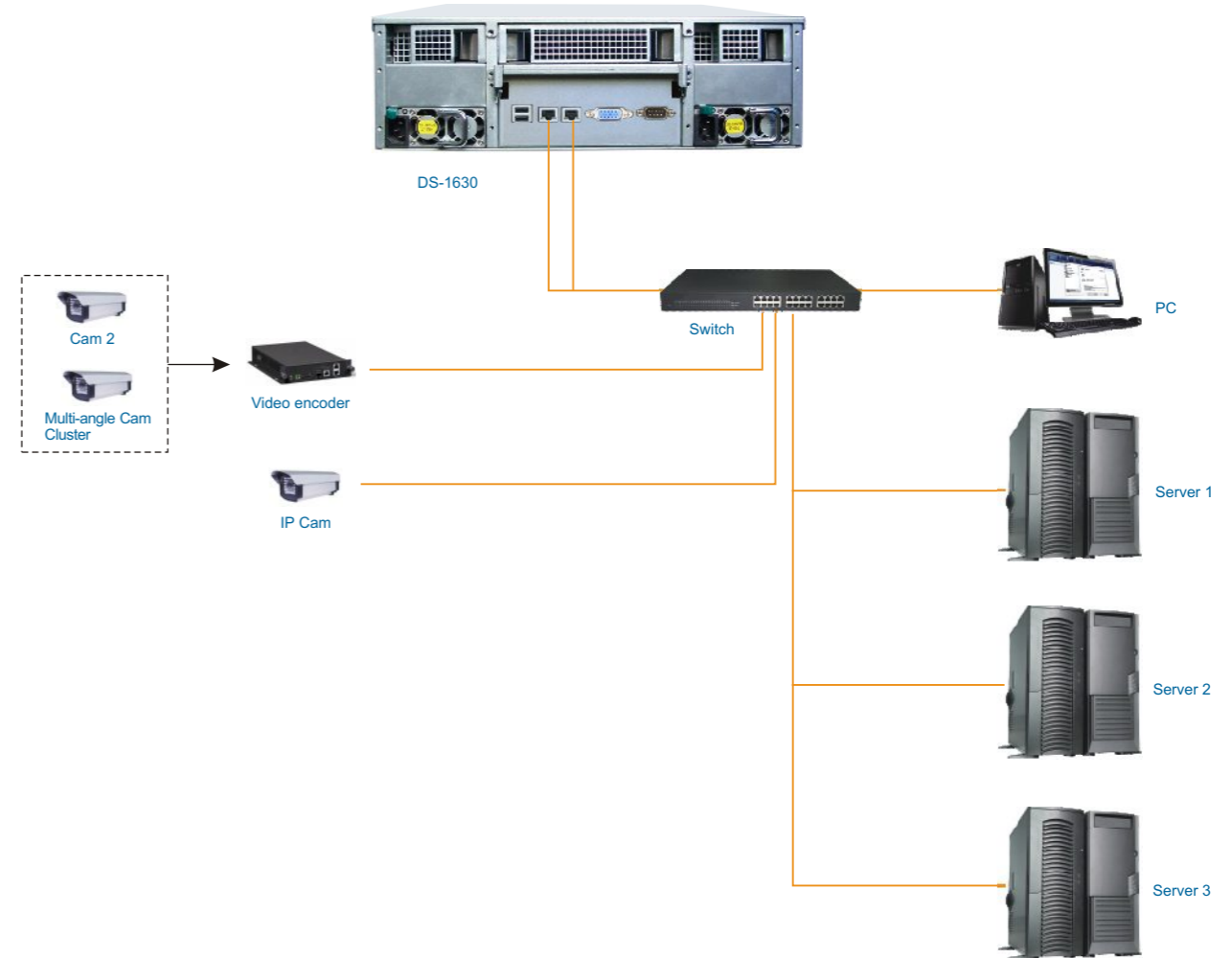
### Specifications :

Mode	DS-1620		
Rack-mount	3U	Data Transfer Rate	1200Mb/s
HDD interface	SATA	Power Units	2x 300W as the default, with 2x 600W optional
HDD support	3.5"	Intelligent Adjustment	Temperature, fan speed and power supply
RAID support	By RAID Controller	Feature	16-bay Mini SAS storage system
Host interface	1x Mini SAS	Fan module	3x 1U turbo fans
Backplane interface	SATA	Control and indicators	System alarm, status indicators (power, voltage, fan and temperature), system reset
Number of HDD	16	Operation condition	Temperature range is up to the HDD. Relative humidity is within 0 ~ 90%, non-condensing.
JBOD expansion	No	Storage condition	Temperature -40~ 85°C,relative humidity 0~90%,non condensing
Max. Number of HDD	16	Dimensions	433mm x 550mm x 133mm (WxDxH)
Processor	--		
Memory	--		
IOPS	By RAID Controller		

## DS-1630 NAS Storage System

DS-1630 is a network attached storage system. With Intel Pineview + ICH8 platform, it provides two Gigabit Ethernet connections, two USB 2.0, one VGA, one serial port and 16 hot-swappable HDD bays. Thanks to its high-reliability modular design, DS-1630 is the ideal solution for customers who need a storage solution for medical video storing, high-bandwidth storage application, DVR storage, data center, file server, and etc.

Each of the 16 bays of DS-1630 supports any SATA hard disk in the market. All the connectors between any two inner modules are highly-reliable VHDM connectors.

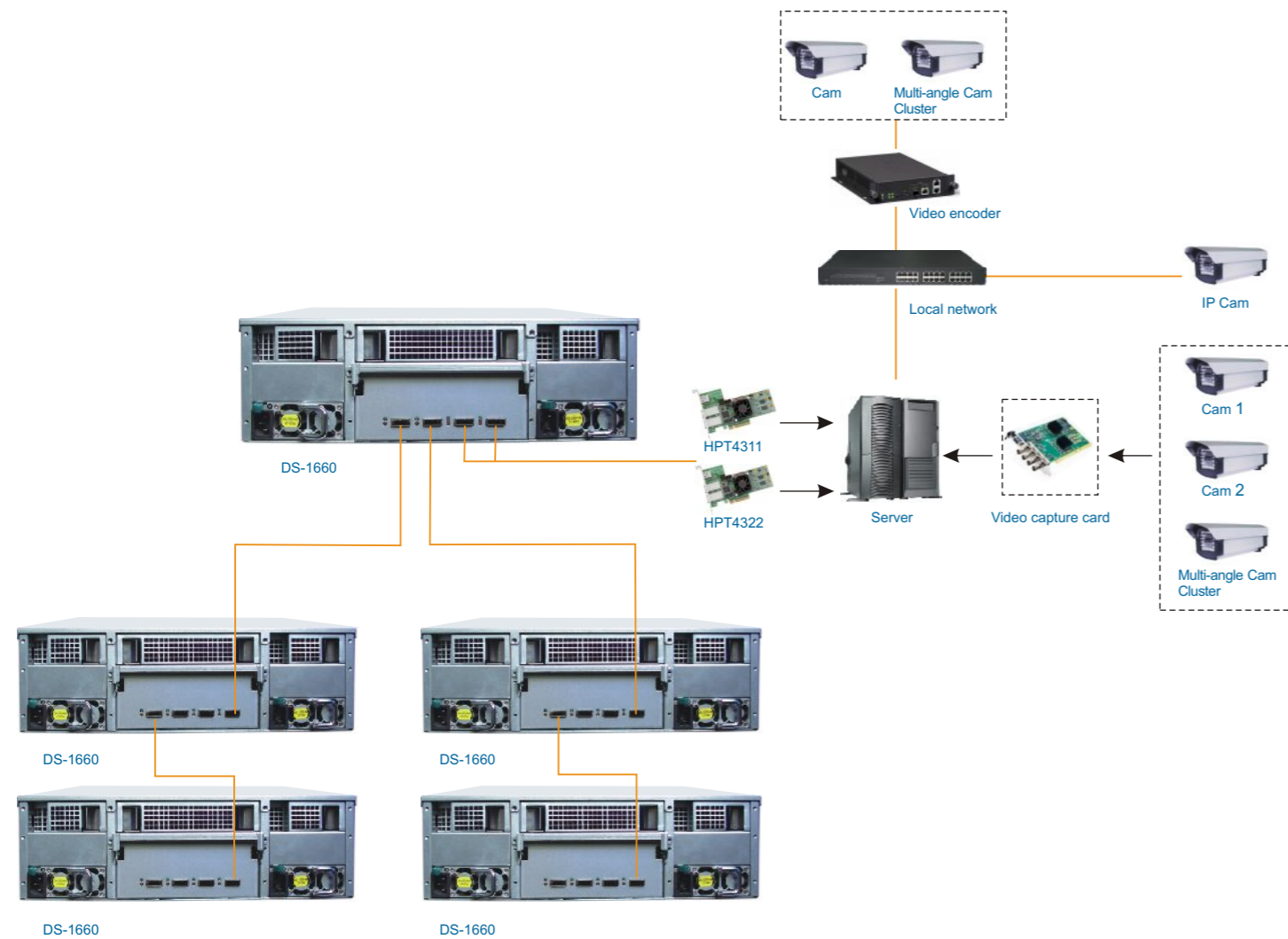


### Specifications :

Mode	DS-1630		
Rack-mount	3U	Data Transfer Rate	200MB/s
HDD interface	SATA	Power Units	2x 300W as the default, with 2x 600W optional
HDD support	3.5"	Intelligent Adjustment	Temperature, fan speed and power supply
RAID support	RAID0、RAID1、RAID5	Feature	16-bay SAS/SATA storage system
Host interface	2x Gigabit LAN	Fan module	3x 1U turbo fans
Backplane interface	SATA	Control and indicators	System alarm, status indicators (power, voltage, fan and temperature), system reset
Number of HDD	16	Operation condition	Temperature range is up to the HDD. Relative humidity is within 0 ~ 90%, non-condensing.
JBOD expansion	No	Storage condition	Temperature -40~ 85°C,relative humidity 0~90%,non condensing
Max. Number of HDD	16	Dimensions	433mm x 550mm x 133mm (WxDxH)
Processor	Pineview		
Memory	2GB Max.		
IOPS	--		

## DS-1660 Mini SAS High-speed Data Transfer Storage System

DS-1660 is an SAS Expand product, with 2 Mini SAS connectors supporting up to 24Gbps Bandwidth. It supports single host connection and redundant connection as well. With its 2 Mini SAS JBOD connectors, 3-level expansion can be established and up to 256 SAS/SATA HDD can be mounted, which is an ideal solution for large database application.

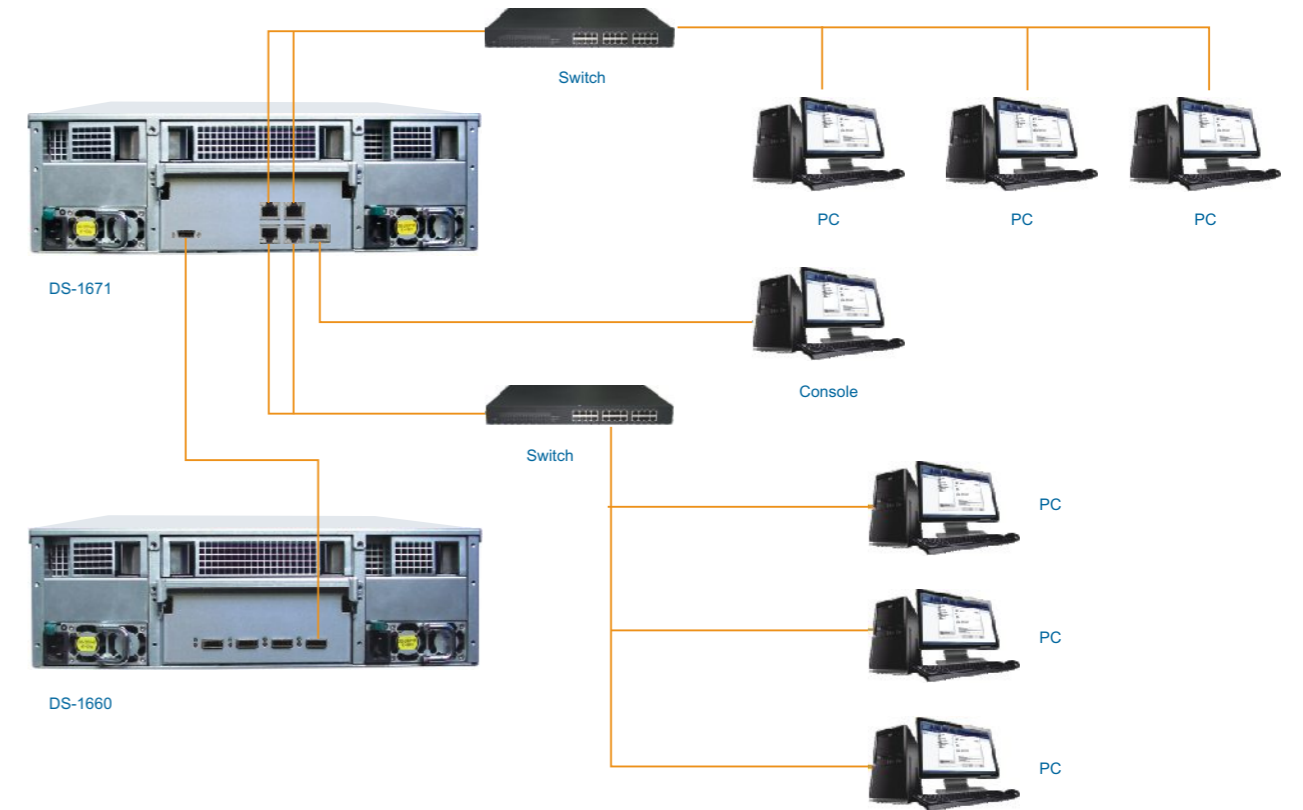


### Specifications :

Mode	DS-1660		
Rack-mount	3U	Data Transfer Rate	2400Mb/s
HDD interface	SAS/SATA	Power Units	2x 300W as the default, with 2x 600W optional
HDD support	3.5"	Intelligent Adjustment	Temperature, fan speed and power supply
RAID support	By RAID Controller	Feature	16-bay SAS/SATA storage system
Host interface	2x Mini SAS	Fan module	3x 1U turbo fans
Backplane interface	SAS/SATA	Control and indicators	System alarm, status indicators (power, voltage, fan and temperature), system reset
Number of HDD	16	Operation condition	Temperature range is up to the HDD. Relative humidity is within 0 ~ 90%, non-condensing.
JBOD expansion	Yes	Storage condition	Temperature -40~ 85°C, relative humidity 0~90%, non condensing
Max. Number of HDD	256	Dimensions	433mm x 550mm x 133mm (WxDxH)
Processor	V3000		
Memory	Embedded RAM		
IOPS	By RAID Controller		

## DS-1671 iSCSI Storage System

DS-1671 is a storage array system based on iSCSI technology, which is equipped with Intel i80342 processor and 4 iSCSI GbE connectors supporting up to 6Gbps data transfer rate. Multi links can be easily set up between the disk array and the host. It also feature a SAS JBOD connector which supports up to 80 SAS/SATA hard disks and makes it very appealing for the customers who need to establish a large storage network or IP SAN centralized storage system.

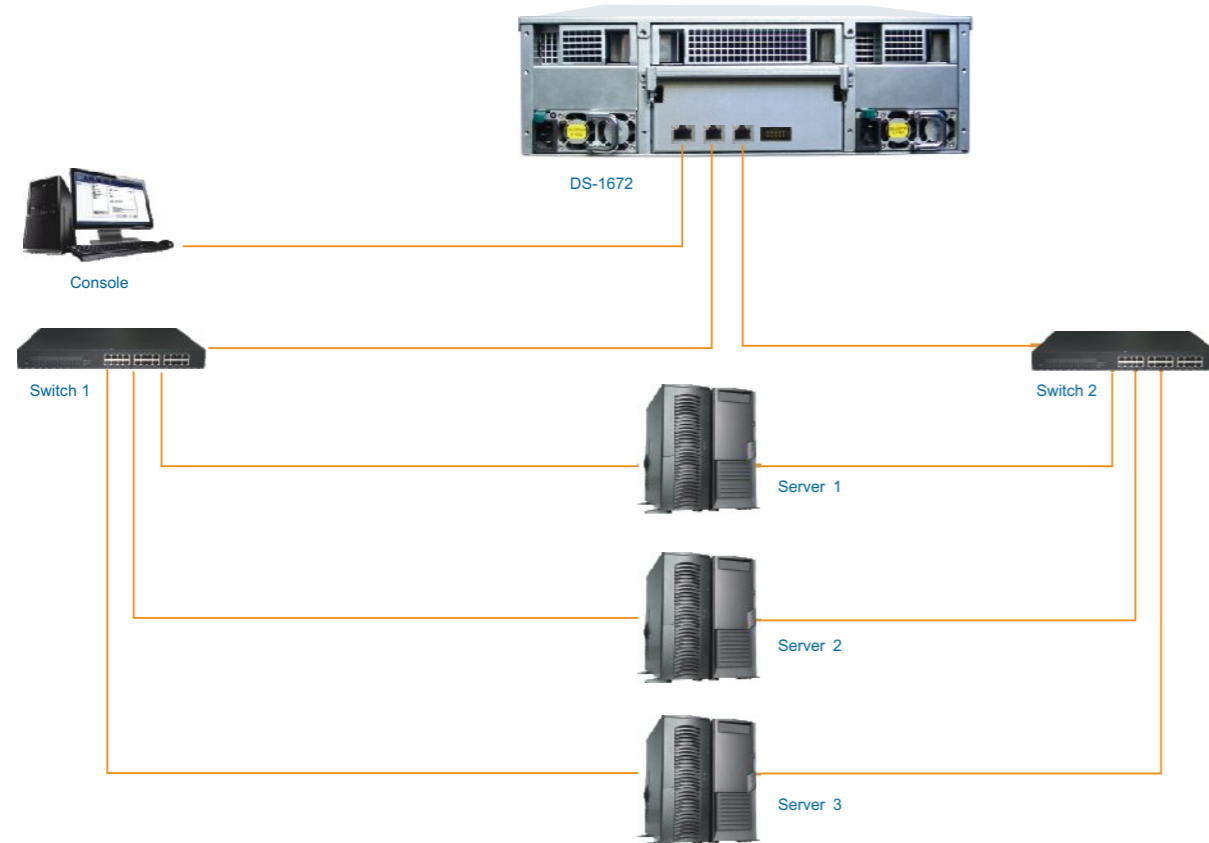


### Specifications :

Mode	DS-1671		
CPU	Intel i80342	Front-panel LCD and buttons	To configure and inspect the status of the system
Cache	512MB~2048MB DDR RAM	RS-232	To configure and inspect the status of the system
HDD Connector	SAS/SATA II	GUI	Via internal Ethernet connection, based on Web browsing
HDD Channels	16 (MAX. 80, with SAS JBOD expansion)	Event report	LCD, internal beeper, Email and SNMP
Hot-Swappable HDD bays	16 x 3.5" HDD	Pathguard software	Multiple-path management, switch and recovery, dynamic I/O balancing
Hot-Swappable Power Unit	Supported	Relative Humidity	10% ~ 80% non-condensing
AC Voltage	100 to 240V (+/-10%), 47 to 63 Hz	Operating Temperature	5°C~40°C
BBU	1	Storage Temperature	-25°C~60°C
Hot-Swappable Fans	3 x turbo fans(3,600 rpm)	Certificates	UL, CUL, CB
Controller port	1	EMC	FCC, CE, C-Tick, BSMI
Host ports	iSCSI GbE	Dimensions	485mm x 574mm x 132mm(WxDxH)
Bandwidth	Up to 1Gbps	Net Weight	24Kgs (w/o HDD)
Host channels	4	Package Dimensions	610mm x 790mm x 450mm(WxDxH)
RAID levels	JBOD, 0, 1, 0+1, 3, 5, 30, 50, 6, NRAID	Gross Weight	33Kgs (w/o HDD)
RAID groups	Max. 16		
DATA reconstruction	Automatic reconstruction		
RAID feature support	Global/dedicated hot spare, multiple host ID, multiple RAID VG, multiple UDV, foreground/background initialize, array roaming		
Software backup	Optional		
Snapshot	Yes		

## DS-1672 iSCSI Storage System

DS-1672 is a storage array system based on iSCSI technology, which is equipped with Intel i80341 processor and 2 iSCSI GbE connectors supporting up to 2Gbps data transfer rate under dual channel mode. Multi links can be easily set up between the disk array and the host. Every iSCSI GbE connection supports 16 SATA HDD which makes it very appealing for the customers who need to establish an IP SAN centralized storage system.

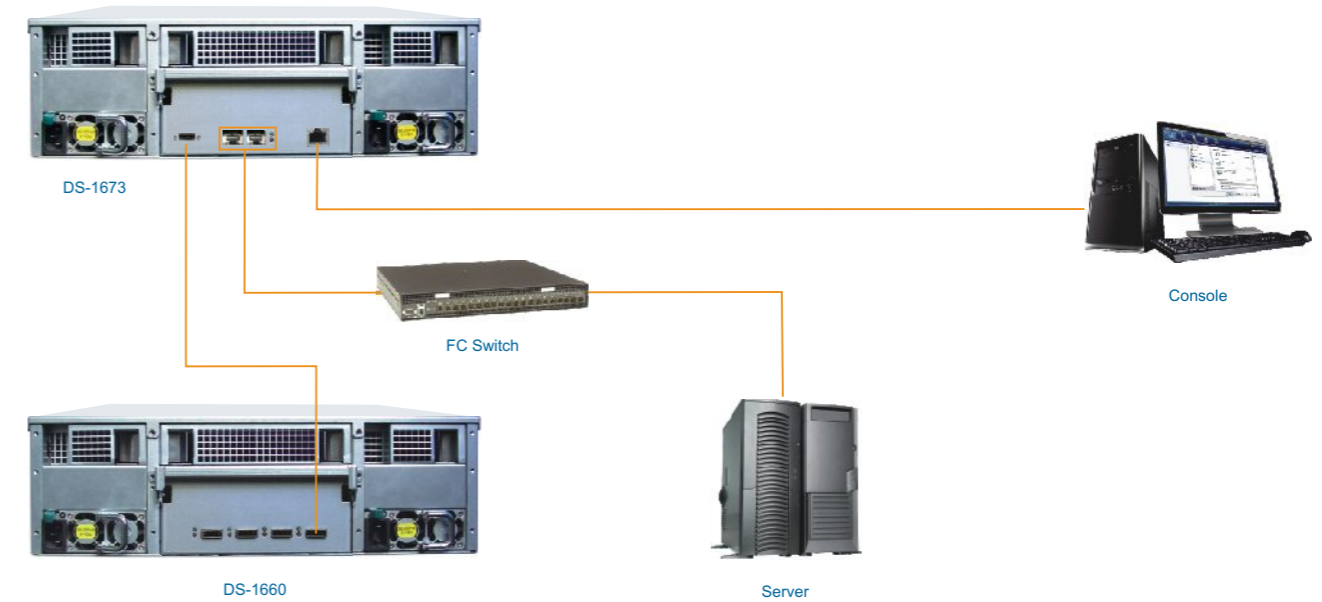


### Specifications :

Mode	DS-1672		
CPU	Intel i80341	Front-panel LCD and buttons	To configure and inspect the status of the system
Cache	512MB~2048MB DDR RAM	RS-232	To configure and inspect the status of the system
HDD Connector	SAS/SATA II	GUI	Via internal Ethernet connection, based on Web browsing
HDD Channels	16	Event report	LCD, internal beeper, Email and SNMP
Hot-Swappable HDD bays	16 x 3.5" HDD	Pathguard software	Multiple-path management, switch and recovery, dynamic I/O balancing
Hot-Swappable Power Unit	Supported	Relative Humidity	10% ~ 80% non-condensing
AC Voltage	100 to 240V (+/-10%), 47 to 63 Hz	Operating Temperature	5°C~40°C
BBU	1	Storage Temperature	-25°C~60°C
Hot-Swappable Fans	3 x turbo fans(3,600 rpm)	Certificates	UL, CUL, CB
Controller port	1	EMC	FCC, CE, C-Tick, BSMI
Host ports	iSCSI GbE	Dimensions	485mm x 574mm x 132mm(WxDxH)
Bandwidth	Up to 1Gbps	Net Weight	24Kgs (w/o HDD)
Host channels	2	Package Dimensions	610mm x 790mm x 450mm(WxDxH)
RAID levels	JBOD, 0, 1, 0+1, 3, 5, 30, 50, 6, NRAID	Gross Weight	33Kgs (w/o HDD)
RAID groups	Max. 16		
DATA reconstruction	Automatic reconstruction		
RAID feature support	Global/dedicated hot spare, multiple host ID, multiple RAID VG, multiple UDV, foreground/background initialize, array roaming		
Software backup	Optional		
Snapshot	Yes		

## DS-1673 FC Storage System

DS-1673 is a storage array system based on FC technology, which is equipped with Intel i803421 processor and 2 Fibre Channel connectors supporting up to 8Gbps data transfer rate. Both single link and redundant link can be easily set up between the disk array and the host. With one SAS JBOD expansion slot, 80 SAS/SATA HDD can be mounted which makes it very appealing for the customers who need a solution for remote storage or remote SAN application.



### Specifications :

Mode	DS-1673		
CPU	Intel i80341	Front-panel LCD and buttons	To configure and inspect the status of the system
Cache	512MB~2048MB DDR RAM	RS-232	To configure and inspect the status of the system
HDD Connector	SAS/SATA II	GUI	Via internal Ethernet connection, based on Web browsing
HDD Channels	16 (MAX. 80, with SAS JBOD expansion)	Event report	LCD, internal beeper, Email and SNMP
Hot-Swappable HDD bays	16 x 3.5" HDD	Pathguard software	Multiple-path management, switch and recovery, dynamic I/O balancing
Hot-Swappable Power Unit	Supported	Relative Humidity	10% ~ 80% non-condensing
AC Voltage	100 to 240V (+/-10%), 47 to 63 Hz	Operating Temperature	5°C~40°C
BBU	1	Storage Temperature	-25°C~60°C
Hot-Swappable Fans	3 x turbo fans(3,600 rpm)	Certificates	UL, CUL, CB
Controller port	1	EMC	FCC, CE, C-Tick, BSMI
Host ports	4Gb Fibre Channel	Dimensions	485mm x 574mm x 132mm(WxDxH)
Bandwidth	4Gb, compliant with 1Gbps and 2Gbps	Net Weight	24Kgs (w/o HDD)
Host channels	2	Package Dimensions	610mm x 790mm x 450mm(WxDxH)
RAID levels	JBOD, 0, 1, 0+1, 3, 5, 30, 50, 6, NRAID	Gross Weight	33Kgs (w/o HDD)
RAID groups	Max. 16		
DATA reconstruction	Automatic reconstruction		
RAID feature support	Global/dedicated hot spare, multiple host ID, multiple RAID VG, multiple UDV, foreground/background initialize, array roaming		
Software backup	Optional		
Snapshot	Yes		