



QNAP Turbo NAS

TS-1685 Hardware User Manual

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Thank you for choosing QNAP products! This user manual provides description of the hardware of the Turbo NAS and relevant guideline of certain functions. Please read carefully and strictly adhere to the instructions of the manual.

This user manual is applicable to the following Turbo NAS models:

TS-1685

NOTE

- The "Turbo NAS" is hereafter referred to as "NAS".
- The product you purchased may not support certain functions dedicated to specific models.
- All features, functionality, and other product specifications are subject to change without prior notice or obligation.
- Information presented is subject to change without notice.
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Note:

- Back up your system periodically to avoid any potential data loss. QNAP disclaims any responsibility of all sorts of data loss or recovery.
- Should you return any components of the NAS package for refund or maintenance, make sure they are carefully packed for shipping. Any form of damages due to improper packaging will not be compensated.

Regulatory Notice



FCC Class B Notice

The TS-1685 complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Modifications: Any modifications made to this device that are not approved by QNAP Systems, Inc. may void the authority granted to the user by the FCC to operate this equipment.



The TS-1685 series complies with CE compliance classes B.

RESTRICTED ACCESS LOCATION

This equipment must be only located where both of the following apply:

- Only authorized and knowledgeable personnel can access the equipment
- Access to the equipment is restricted through the use of lock and key or other means of security and this access is controlled by those in charge of the location.

Symbols in this document



 Warning	This icon indicates the instructions must be strictly followed. Failure to do so could result in injury to human body or death.
 Caution	This icon indicates the action may lead to disk clearance or loss OR failure to follow the instructions could result in data damage, disk damage, or product damage.

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Safety Warnings

1. The NAS can operate normally in temperatures of 0°C - 40°C (32°F - 104°F) and relative humidity of 5% - 95%. Please make sure the environment is well-ventilated.
2. The power cord and devices connected to the NAS must provide correct supply voltage (100W, 90–264V).
3. Do not place the NAS in direct sunlight or near chemicals. Make sure the temperature and humidity of the environment are in optimized level.
4. Unplug the power cord and all connected cables before cleaning. Wipe the NAS with a dry towel. Do not use chemical or aerosol to clean the NAS.
5. Do not place any objects on the NAS for the server's normal operation and to avoid overheat.
6. Use the flat head screws in the product package to lock the hard disks in the NAS when installing hard disks for proper operation.
7. Do not place the NAS near any liquid.
8. Do not place the NAS on any uneven surface to avoid falling off and damage.
9. Make sure the voltage is correct in the location where the NAS is installed. Contact the distributor or the local power supply company for the information.
10. Do not place any object on the power cord.
11. Do not attempt to repair the NAS in any occasions. Improper disassembly of the product may expose the users to electric shock or other risks. For any enquiries, please contact the distributor.
12. The NAS should only be installed in the server room and maintained by the authorized server manager or IT administrator. The server room is locked by key or keycard access and only certified staff is allowed to enter the server room.



Warning:

- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- Do NOT touch the fan inside the system to avoid serious injuries.

Chapter 1. Product Overview



Caution: Any unauthorized modifications performed on QNAP products will result in the warranty being voided. QNAP is not responsible for any form of damage or loss of data caused by such modifications. Unauthorized modifications include, but are not limited to, changes made to the default system firmware, installation of unofficial third party applications, and changes to the hardware performed by unauthorized technicians.

1.1 Hardware Specification

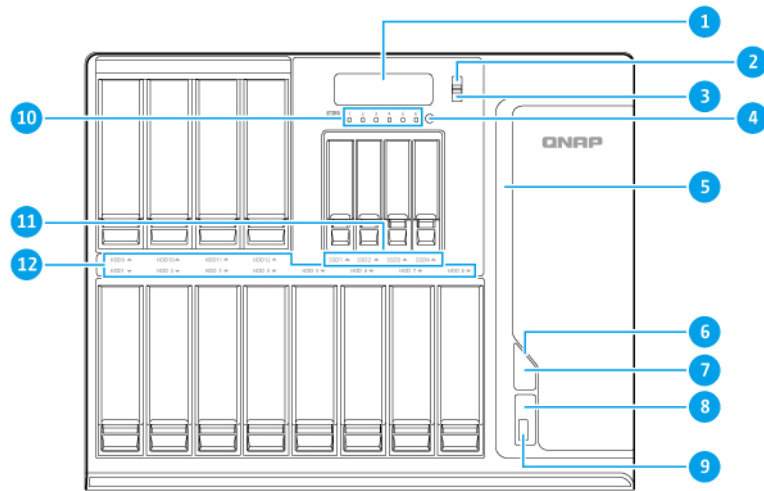
	TS-1685
CPU	Intel® Xeon® Processor D-1521 quad-core 2.4 GHz Intel® Xeon® Processor D-1531 6-core 2.2 GHz
System memory	16GB non-ECC RAM (8GB UDIMM*2) 32GB non-ECC RAM (16GB UDIMM*2) 64GB non-ECC RAM (16GB UDIMM*4) 64GB ECC RAM (16GB RDIMM*4) 128GB ECC RAM (32GB RDIMM*4)
Flash memory	512 MB (USB DOM)
CPU replaceable	No
Memory replaceable	Yes
Memory slots	4 x Long-DIMM slots
3.5" drive slots	12 x SATA 6 Gb/s (3.5-inch HDD, 2.5-inch HDD& SSD)
2.5" drive slots	4 x SATA 6 Gb/s (2.5-inch SSD)
M.2 SSD slots	6 x M.2 2242/2260/2280/22110 SATA 6 Gb/s
PCIe slots	3: Slot 1: PCIe Gen.3 x8 Slot 2: PCIe Gen.2 x4 Slot 3: PCIe Gen.3 x8
10 GbE LAN ports	2 x 10GBASE-T
GbE LAN ports	4
LED panel	Mono-LCD display with backlight Enter and Select buttons for configuration
USB ports	Front: 1 x USB 3.0 port Rear: 2 x USB 3.0 port
Audio outputs	1 x built-in speaker

	1 x 3.5mm Line-out jack Note: Only one of the above audio output ports can work at a time. If a speaker is connected, the sound will output through the speaker.
LED indicators	Status, USB One Touch Copy, HDD 1-12, SSD 1-4, M.2 SSD 1-6
Buttons	Power, USB One Touch Copy, Reset
IR sensor	QNAP RM-IR004 remote control (MCE compatible)
Security	Kensington security slot
Form factor	Tower
Power Supply	100-240V~, 3-1.5A, 60-50Hz, 250W PSU 100-240V~, 3-1.5A, 60-50Hz, 550W PSU
System fans	3 x 9.2cm system fan (12V DC)
CPU fans	2 x 9cm fan

1.2 Ordering Information

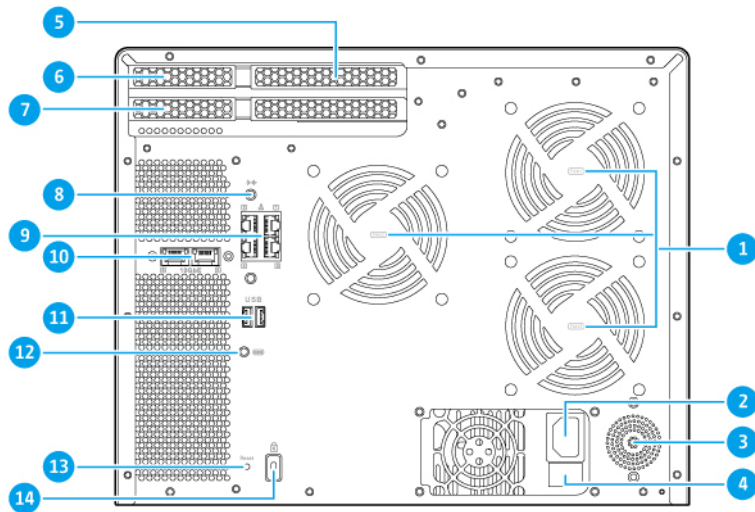
NAS	SKUs
TS-1685-D1521-16G	Intel® Xeon® Processor D-1521, 16GB non-ECC RAM (8GB UDIMM*2), 250W PSU
TS-1685-D1521-32G	Intel® Xeon® Processor D-1521, 32GB non-ECC RAM (16GB UDIMM*2), 250W PSU
TS-1685-D1521-32G-550W	Intel® Xeon® Processor D-1521, 32GB non-ECC RAM (16GB UDIMM*2), 550W PSU
TS-1685-D1531-32G	Intel® Xeon® Processor D-1531, 32GB non-ECC RAM (16GB UDIMM*2), 250W PSU
TS-1685-D1531-64G	Intel® Xeon® Processor D-1531, 64GB non-ECC RAM (16GB UDIMM*4), 250W PSU
TS-1685-D1531-64GR	Intel® Xeon® Processor D-1531, 64GB ECC RAM (16GB RDIMM*4), 250W PSU
TS-1685-D1531-128GR	Intel® Xeon® Processor D-1531, 128GB ECC RAM (32GB RDIMM*4), 250W PSU
TS-1685-D1531-64GR-550W	Intel® Xeon® Processor D-1531, 64GB ECC RAM (16GB RDIMM*4), 550W PSU
TS-1685-D1531-128GR-550W	Intel® Xeon® Processor D-1531, 128GB ECC RAM (32GB RDIMM*4), 550W PSU

1.3 Components



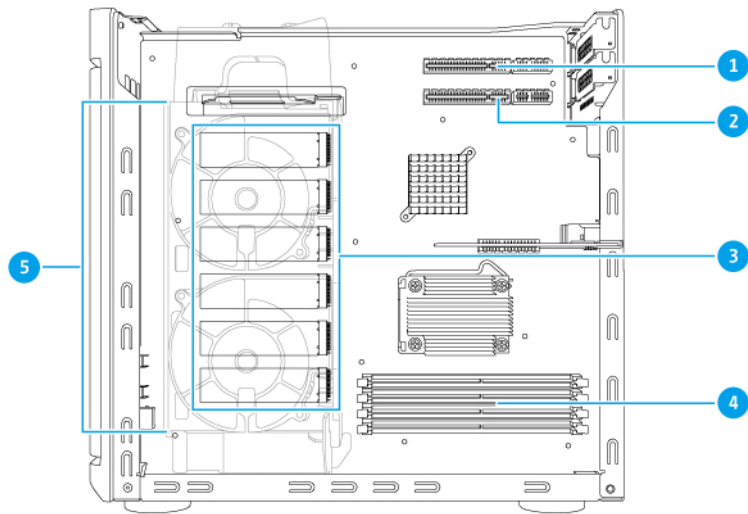
Front View

No.	Component
1	LCD panel
2	Enter button
3	Select button
4	IR sensor
5	Power LED (adjustable brightness)
6	Power button
7	Status LED
8	USB One-touch Copy button
9	USB 3.0 One-touch Copy port
10	M.2 SSD LEDs
11	SSD LEDs
12	HDD LEDs



Back View

No.	Component
1	System fans 1 -3
2	Power input
3	Speaker
4	Power switch
5	PCIe slot 1 (full height)
6	PCIe slot 2 (low profile)
7	PCIe slot 3 (low profile)
8	3.5 mm speaker jack
9	Gigabit ports
10	10 GbE 10GBASE-T port
11	USB 3.0 ports
12	Console port
13	Reset button
14	Kensington security slot



Side View

No.	Component
1	PCIe slot 2 socket (low profile)
2	PCIe slot 3 socket (low profile)
3	M.2 SSD slots
4	Memory slots
5	CPU fans

Chapter 2. Basic Operations

2.1 Power button

- Power button: Press to turn on or turn off.

System	Power button (Turn on)	Power button (Hardware turn off)	Power button (Force turn off)
All models	Press once	1.5 sec	5 sec

2.2 Reset button

- Reset button: Press to reset the system settings.

System	Basic system reset (1 beep)	Advanced system reset (2 beeps)
All models	3 sec	10 sec

Basic system reset (3 sec)

Press the reset button for 3 seconds, a beep sound will be heard. The following settings are reset to default:

- System administration password: admin
- TCP/IP configuration: Obtain the IP address settings automatically via DHCP
- TCP/IP configuration: Disable Jumbo Frame
- TCP/IP configuration: If port trunking is enabled (dual LAN models only), the port trunking mode will be reset to "Active Backup (Failover)".
- System Port: 8080 (system service port)
- Security Level: Low (Allow all connections)
- LCD panel password: (blank)
- VLAN will be disabled.
- Service binding: All the NAS services run on all available network interfaces.

Advanced system reset (10 sec)

Press the reset button for 10 seconds; you will hear two beeps at the third and the tenth seconds. The NAS will reset all the system settings to default as it does by web-based system reset in "Control Panel" > "System Settings" > "Backup / Restore" > "Restore to Factory Default" except all the data are reserved. The settings such as the users, user groups, and the network share folders previously created will be cleared. To retrieve the old

data after the advanced system reset, create the same network share folders on the NAS and the data will be accessible again.

2.3 USB One Touch Copy

System	Number of seconds (press the one touch copy button to trigger data copy)
All NAS models	0.5 sec

Data Copy by the Front USB Port

The NAS supports instant data copy backup from the external USB device to the NAS or the other way round by the front one touch copy button. To use this function, follow the steps below:

1. Make sure a drive is installed and formatted on the NAS. The default network share Qusb or Usb is created.
2. Turn on the NAS.
3. Log into QTS as an administrator.
4. Go to "Main Menu" > "Backup Station" > "USB One Touch Copy".
5. Under One touch backup for external device, select USB One Touch Copy.
6. Configure the behavior of USB One Touch Copy.
7. Connect the USB storage device to the front USB port of the NAS.
8. Press the Copy button. The USB LED will flash. The data will be copied to or from the USB device according to the NAS settings.

Note:

- This feature adopts incremental backup. After the first time data backup, the NAS only copies the changed files since the last backup.
- This feature is only available on certain NAS models. Please refer to the product specification table for details at www.qnap.com.

2.4 LED

The LED indicators of the NAS indicate the system status and information. When the NAS is turned on, check the following items to make sure the system status is normal. Note that the following LED information is applicable only when users have properly installed the drive, and connected the NAS to the network and the power supply.

LED	LED Status	Description
System Status	Flashes green and red alternately every 0.5 sec	<ol style="list-style-type: none"> 1. The hard drive on the NAS is being formatted. 2. The NAS is being initialized. 3. The system firmware is being updated. 4. RAID rebuilding is in process. 5. Online RAID capacity expansion is in process. 6. Online RAID level migration is in process.
	Red	<ol style="list-style-type: none"> 1. The drive is invalid. 2. The disk volume has reached its full capacity. 3. The disk volume is going to be full. 4. The system fan is out of function. 5. An error occurs when accessing (read/write) the disk data. 6. A bad sector is detected on the drive. 7. The NAS is in degraded read-only mode (2 member drives fail in a RAID 5 or RAID 6 configuration, the disk data can still be read). 8. Hardware self-test error.
	Flashes red every 0.5 sec	The NAS is in degraded mode (one member drive fails in RAID 1, RAID 5 or RAID 6 configuration).
	Flashes green every 0.5 sec	<ol style="list-style-type: none"> 1. The NAS is starting up. 2. The NAS is not configured. 3. A hard disk drive is not formatted.
	Green	The NAS is ready.
	Deep flashes of orange	The NAS is in sleep mode.

	Off	All the drives on the NAS are in standby mode.
LAN	Orange	The disk data is being accessed from the network and a read/write error occurs during the process.
	Flashes orange	The NAS is connected to the network.
HDD/SSD/M.2 SSD	Flashes red	The NAS is being accessed from the network.
	Red	A drive read/write error occurs.
	Flashes green	The disk data is being accessed.
	Green	The drive can be accessed.
USB	Flashes blue every 0.5 sec	<ol style="list-style-type: none"> 1. A USB device (connected to the front USB port) is being detected. 2. A USB device (connected to the front USB port) is being removed from the NAS. 3. The USB device (connected to the front USB port of the NAS) is being accessed. The data is being copied to or from the external USB device.
	Blue	A front USB device is detected (after the device is mounted).
	Off	No USB device detected.
	Off	The NAS has finished copying the data to or from the USB device connected to the front USB port.

2.5 Beep Alarm

The beep alarm can be disabled in "Control Panel" > "System Settings" > "Hardware".

Beep sound	Number of Times	Description
Short beep (0.5 sec)	1	<ol style="list-style-type: none"> 1. The NAS is starting up. 2. The NAS is being shut down (software shutdown). 3. The user presses the reset button to reset the NAS. 4. The system firmware has been updated.
Short beep (0.5 sec)	3	The NAS data cannot be copied to the external storage device from the front USB port.
Long beep (1.5 sec)	3, every 5 min	The system fan is out of function.
Long beep (1.5 sec)	2	<ol style="list-style-type: none"> 1. The disk volume is going to be full. 2. The disk volume has reached its full capacity. 3. The drives on the NAS are in degraded mode. 4. The user starts the drive rebuilding process. 5. A drive is plugged in or out.
	1	<ol style="list-style-type: none"> 1. The NAS is turned off by force shutdown (hardware shutdown). 2. The NAS has been turned on and is ready.

Chapter 3. Upgrade Memory on QNAP Turbo NAS (RAM Module Installation)



Warning:

- The following instructions should only be performed by an authorized or trained technician.
- Strictly adhere to the instructions in this section to install RAM modules in NAS. Failure to do so could result in property damage, bodily harm or even death.
- Before starting, please ensure that you turn off the NAS, disconnect the power adaptor, network cable(s), and also remove any other device/cable that is attached to the NAS.
- Please ensure that you wear an antistatic wrist strap during the entire process to prevent electrostatic discharge. The crocodile clip should be connected to the ground.
- When installing more than one memory module, it is recommended to use the same size and ideally the same type/model in every slot.

QNAP provides RAM modules (optional purchase) for users to upgrade the NAS memory. Follow the below steps to install an extra memory module on the NAS to upgrade the memory.

The TS-1685 allows users to upgrade the memory in their QNAP NAS devices. Ensure that the type of RAM is compatible with the NAS before installing.

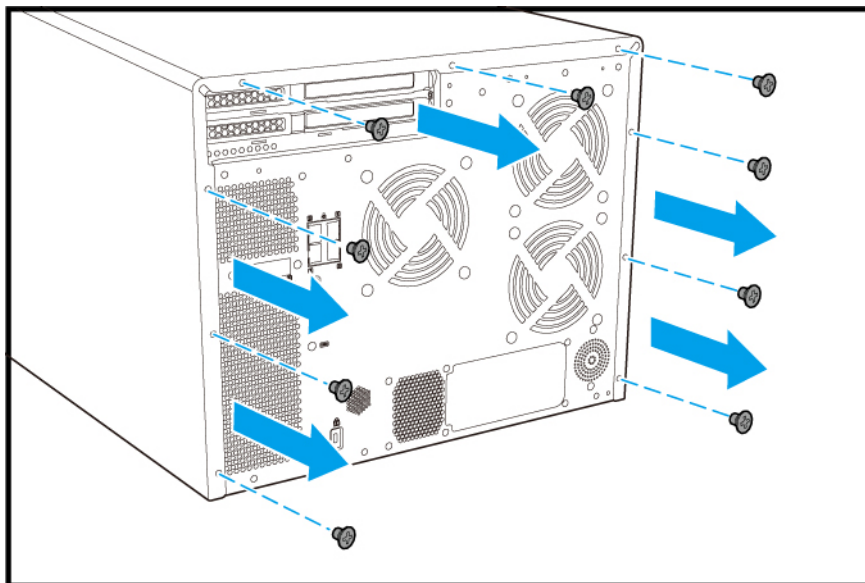
To determine how much memory is currently in the system:

1. Log into QTS as administrator.
2. Go to "Control Panel" > "System Settings" > "System Status" to open the System Status window.
3. To go System Information and check for System memory or Total memory.

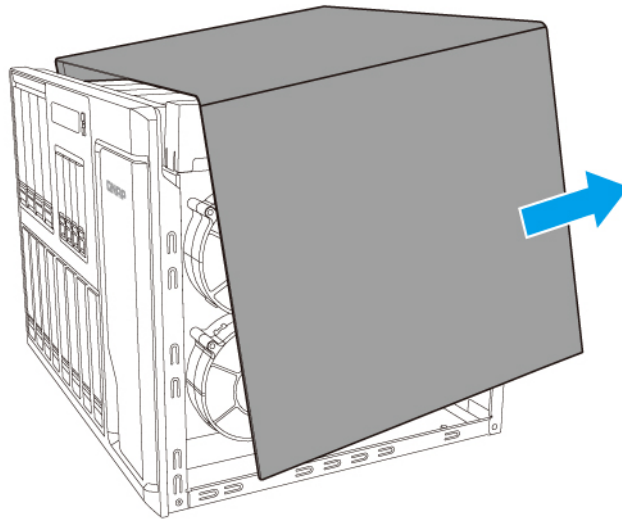
System Information	Network Status	System Service	Hardware Information	Resource Monitor
My NAS <input type="button" value="Refresh"/>				
CPU	Intel(R) Core(TM) i7-6700 CPU @ 3.40GHz			
CPU usage	2.2 %			
Total memory	8 GB (7941.5 MB usable)			
Free memory	7458.2 MB			
Memory slot 1 (Channel A, DIMM 1)	4 GB (Transcend Information)			
Memory slot 2 (Channel B, DIMM 2)	--			
Memory slot 3 (Channel A, DIMM 3)	4 GB (Transcend Information)			
Memory slot 4 (Channel B, DIMM 4)	--			

To install or replace RAM modules:

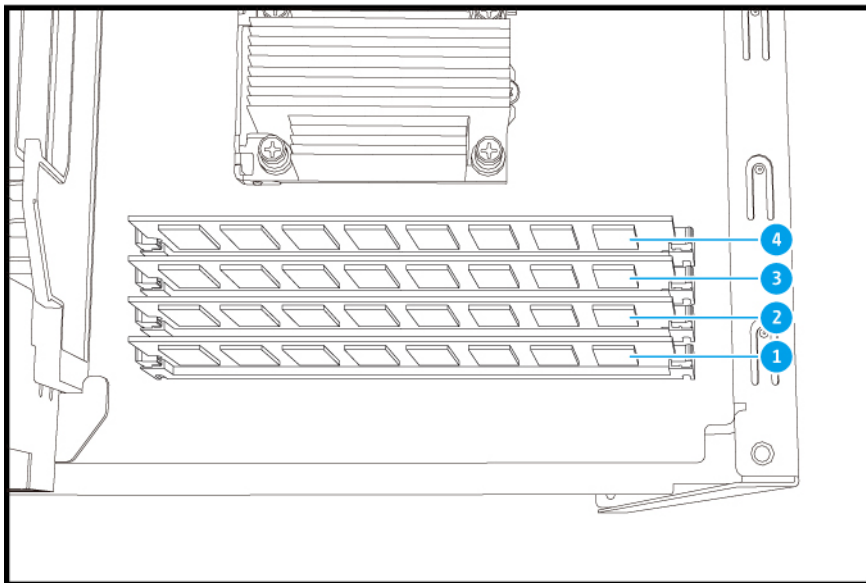
1. Power off the system by pressing the power button for 1.5 seconds or until the system beeps once. Wait for all the LEDs on the front of the system to turn off.
2. Disconnect the power cord, network cables, and any other cables attached to the device.
3. Before opening the NAS, wear an antistatic wrist strap and connect the crocodile clamp to ground to prevent electrostatic discharge from damaging equipment.
4. Remove the screws on the back of the NAS that are connecting the case cover to the chassis.

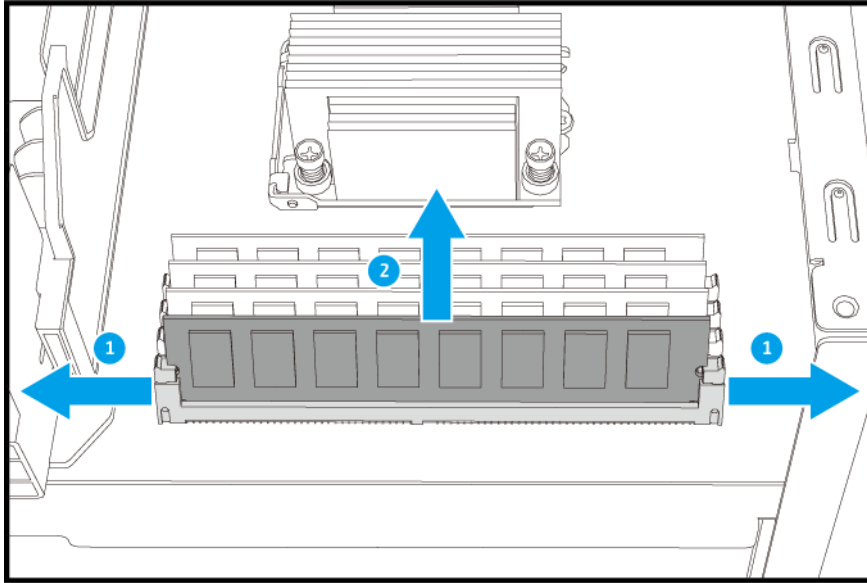


5. Gently remove case cover from case.



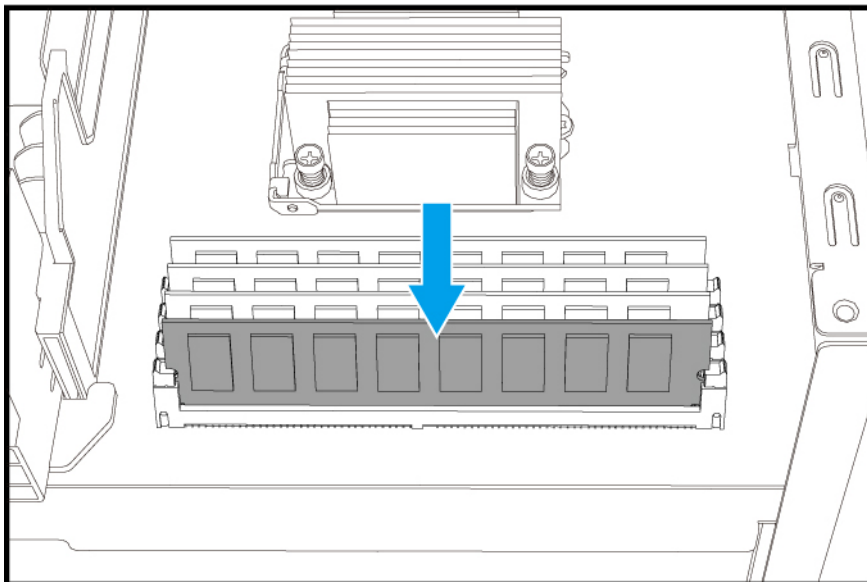
6. Unlock the RAM slot by pressing down on the retention clamps on the sides of the RAM slot. If replacing RAM, remove existing module from socket.

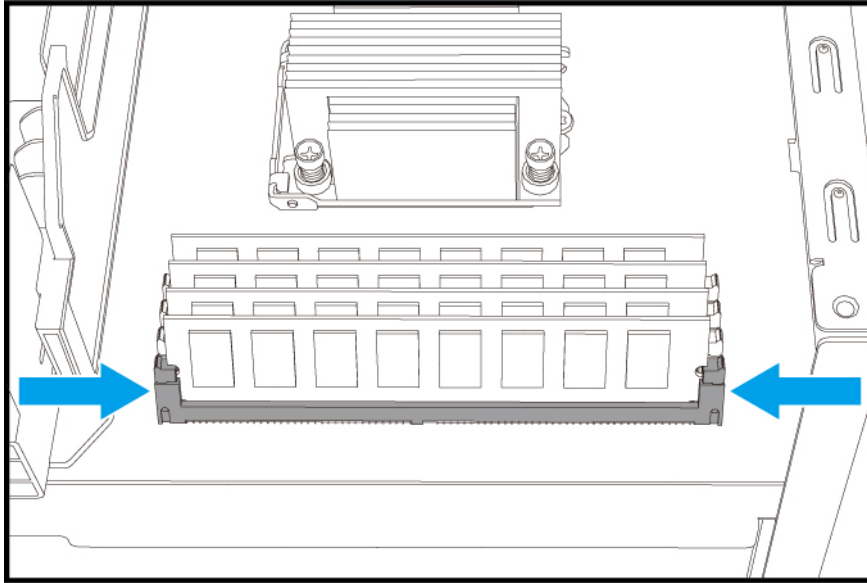




7. Install new RAM:

- i. Grip the new RAM on the edges to avoid touching contacts or circuitry on the module.
- ii. Line up the notch on the RAM to the break in the slot. Ensure that first RAM module is inserted into slot 1 (see below for slot positioning).
- iii. Set the stick into the slot and apply equal pressure onto both ends of the stick until the clamps on the side click and fully lock the RAM in.





8. Close the case cover and fasten the screws.
9. Connect the power adaptor and cables to the NAS. Power on NAS.
10. Optional: Check that the memory has been correctly installed.

Chapter 4. Expansion Card Installation



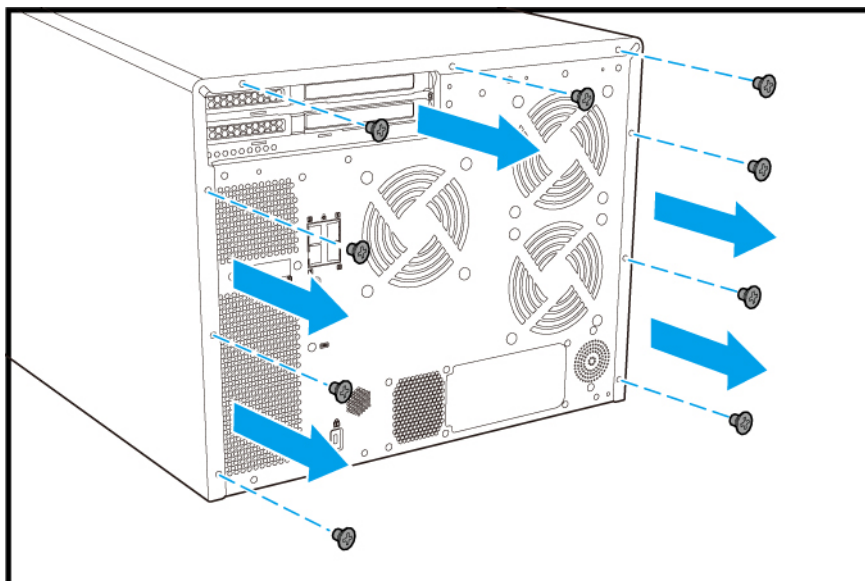
Warning:

- The following instructions should only be performed by an authorized or trained technician.
- Strictly adhere to the instructions in this section to install PCIe add-in card(s) in NAS. Failure to do so could result in property damage, bodily harm or even death.

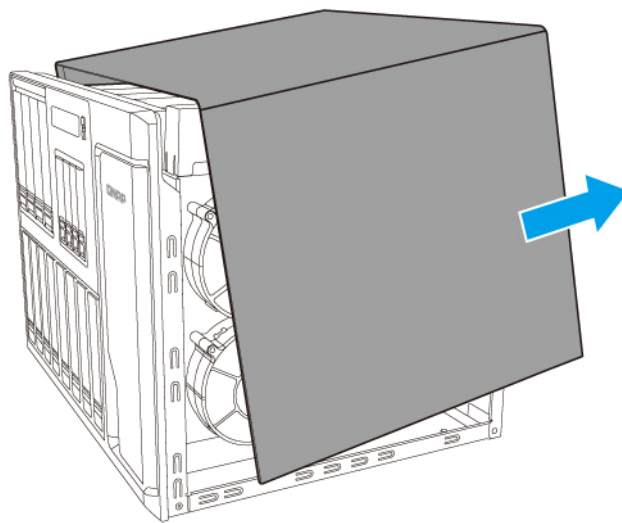
The TS-1685 provides 2 low-profile & one full height PCIe expansion slots so that users can add functionality to their NAS. Refer to the compatibility list at <http://qnap.com/compatibility>.

Follow the steps below to install a PCIe card:

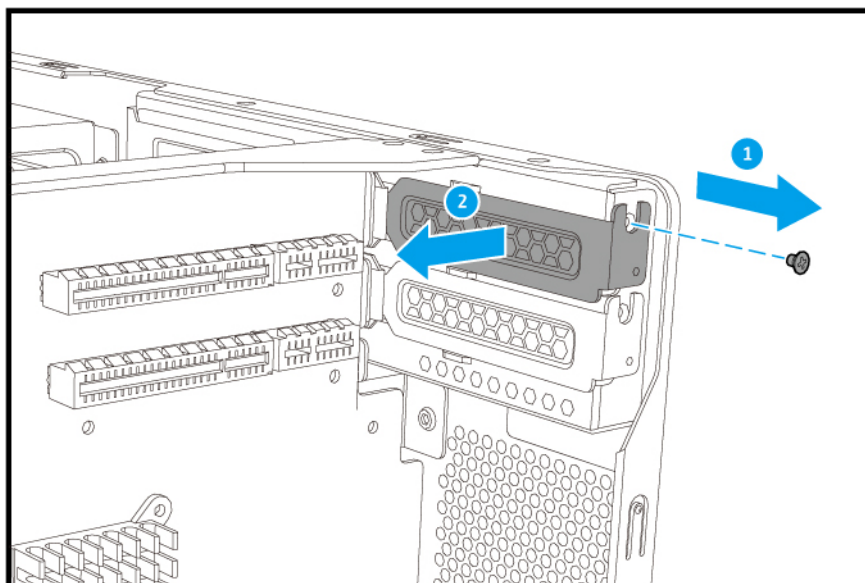
1. Power off the system by pressing the power button for 1.5 seconds or until the system beeps once. Wait for all the LEDs on the front to turn off.
2. Disconnect the power cord, network cables, and any other cables attached to the device.
3. Before opening the NAS, wear an antistatic wrist strap and connect the crocodile clamp to ground to prevent electrostatic discharge from damaging equipment.
4. Remove the screws on the back of the NAS that are connecting the case cover to the chassis.



5. Gently remove case cover from case.

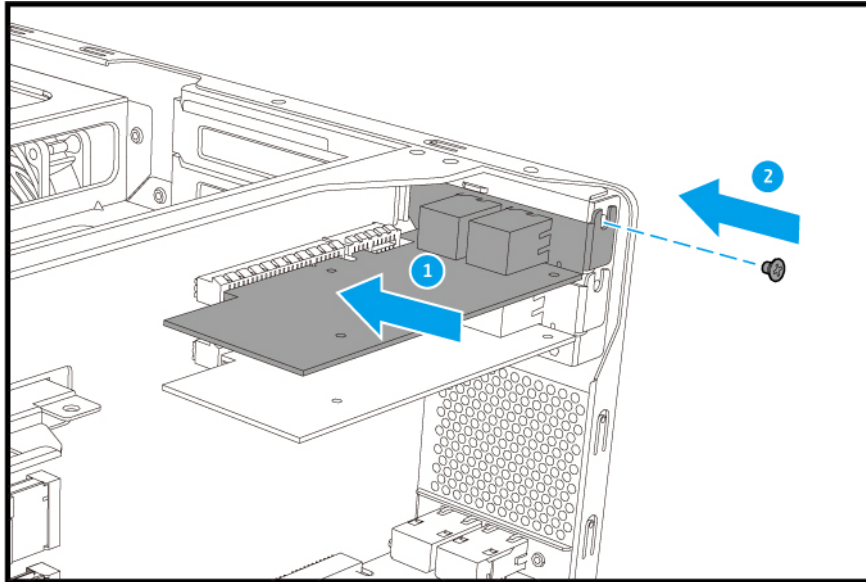


6. Remove the screw of the PCIe cover. Remove the cover.



7. Hold the network expansion card by grasping the edges. Align the notch on the network expansion card to the break in the PCIe slot. Fully insert the network expansion card to the expansion slot.

8. Fasten screw to lock the card in.



9. Close the case cover and fasten the screws.

10. Connect the power adaptor and cables to the NAS.

Chapter 5. Install M.2 SSDs

5.1 M.2 SSD Heat Sink Installation

M.2 cooling modules are packaged with the TS-1685. For reliable operation, it is recommended that you install the M.2 cooling module on your M.2 SSD. You may also install third party heatsinks on the SSD controller directly.

To install M.2 cooling module:

1. Disassemble the M.2 cooling module.
 - i. Slide the clip away from the tray.
 - ii. Separate the heatsink from the tray.
2. Peel off the blue protective film from the heatsink.
3. Install the heatsink onto the top of the M.2 SSD.

- i. Determine the top side of the M.2 SSD by inserting it in the M.2 socket of your NAS.
- ii. Mount the heatsink onto the top of the M.2 SSD.

Note: the figures below display the mounted heatsink locations for different sized M.2 SSDs.

4. Place the M.2 SSD/heatsink module onto the tray.
5. Optional: Install spacer in between the M.2 SSD and the tray if the clip is too loose.
6. Insert the clip.
 - i. Gently squeeze the heatsink and the tray together, and insert the clip at a 35-degree angle.
 - ii. Slide the clip in.

5.2 M.2 SSD Installation

Note: Do not attempt to bend or remove the orange temperature sensor near the M.2 SSD socket.

To install M.2 SSD:

1. Power off the system by pressing the power button for 1.5 seconds or until the system beeps once. Wait for all the LEDs on the front to turn off.
2. Disconnect the power cord, network cables, and any other cables attached to the device.
3. Before opening the NAS, wear an antistatic wrist strap and connect the crocodile clamp to ground to prevent electrostatic discharge from damaging equipment.
4. Remove the screws on the back of the NAS that are connecting the case cover to the chassis.
5. Gently remove case cover from case.
6. Remove the fan module.
 - i. Disconnect the fan cable from the system board.

- ii. Remove the screw connecting the fan module to the chassis.
 - iii. Press down the clip and remove fan module.

7. Install M.2 SSD.
 - i. Attach riser screw based on the M.2 SSD size
 - ii. Insert M.2 SSD into M.2 socket.
 - iii. Attach screw to riser to hold M.2 SSD in place.

8. Attach the fan module.
 - i. Insert fan module into chassis.
 - ii. Attach screw to fan module.
 - iii. Connect fan cable.

9. Close the case cover and fasten the screws.

10. Connect the power adaptor and cables to the NAS.

Chapter 6. Install and Hot-swap Drives

The TS-1685 is compatible with 2.5-inch/3.5-inch SATA drives. For drive compatibility list, go to <http://www.qnap.com/compatibility>.



Caution:

- QNAP is not responsible for product damage/malfunction or data loss due to misuse or improper installation of hard disks.
- Note when a drive is installed in a QNAP NAS for the first time, the drive will be automatically formatted and all the data on disk will be cleared.
- For information on QTS NAS migration, go to docs.qnap.com and check "Migrating from Old NAS" section.

6.1 Drive Bay Numbering

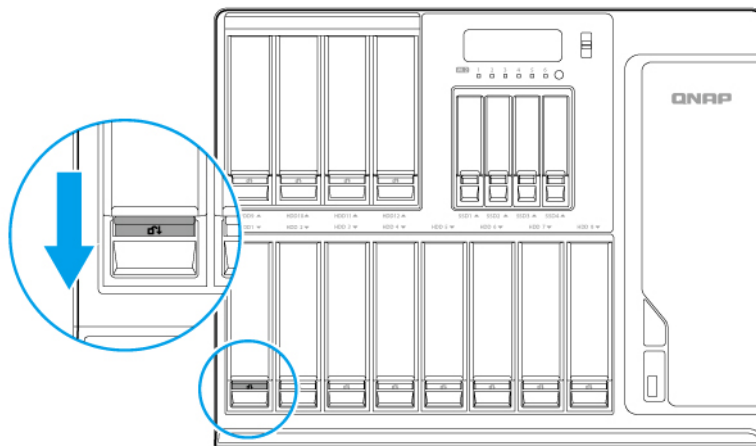
Identify the drive position in the diagram below.

6.2 Installing Drives

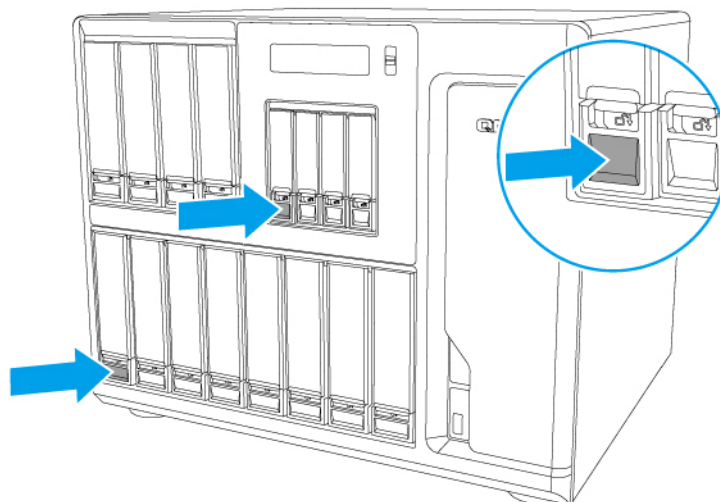
To install drives, follow the steps below:

1. Remove drive tray from NAS:

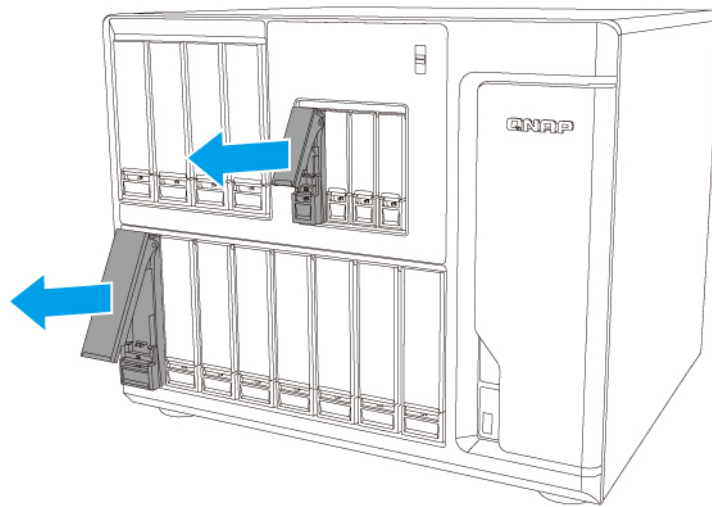
- a. Push the blue lock switch on the tray down to the unlock position.



- b. Push the button below the blue switch to release the lever.



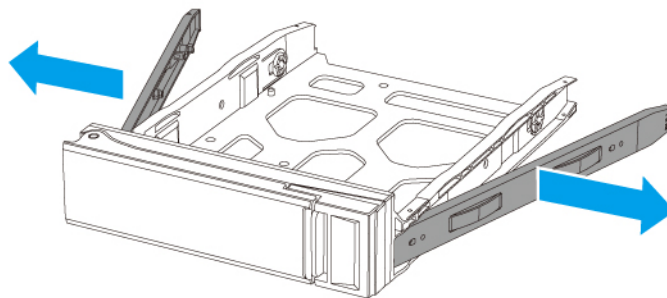
- c. Pull out tray using lever.



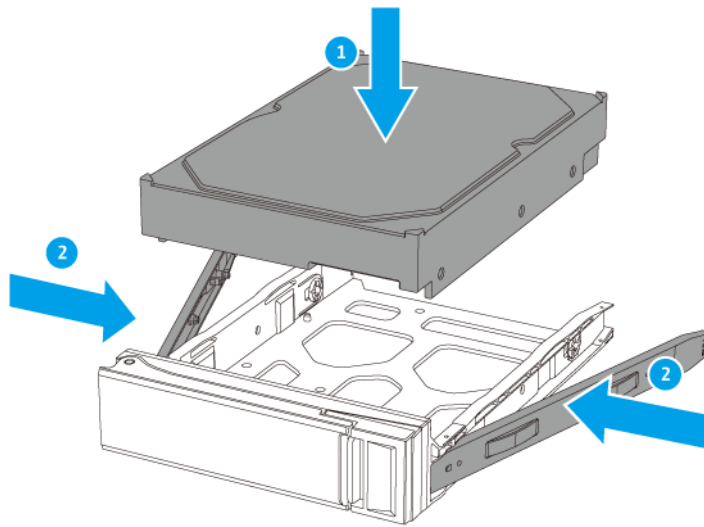
2. Installing a drive on the tray.

- a. 3.5" HDD:

- i. Remove the fastening panels from the sides of a 3.5" drive tray.

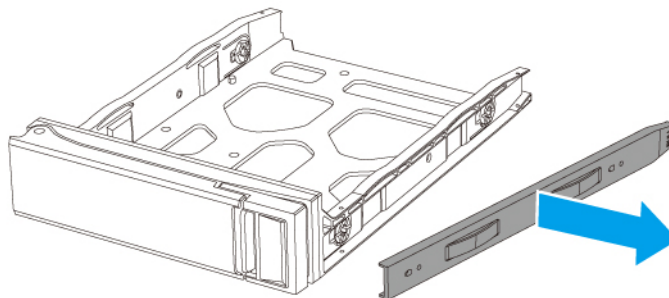


- ii. Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides of the tray.
 - iii. Attach the fastening panels to lock the drive to the tray.
Note: Screws may be inserted for increased stability.

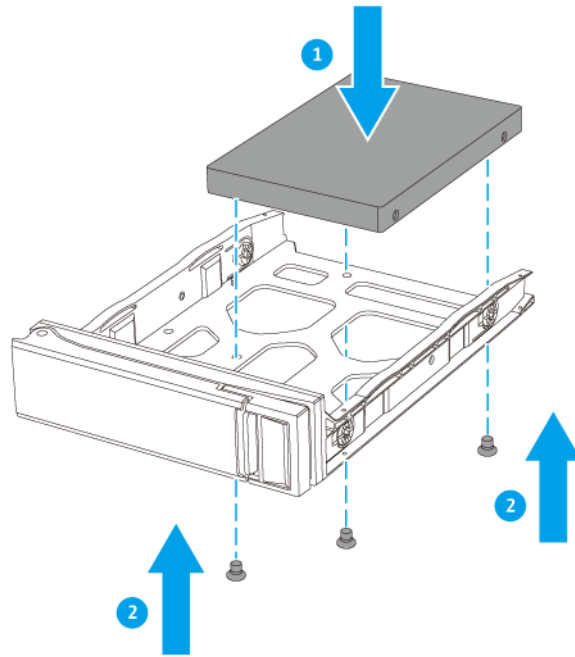


b. 2.5" HDD:

- i. Remove the right fastening panel from the 3.5" drive tray.

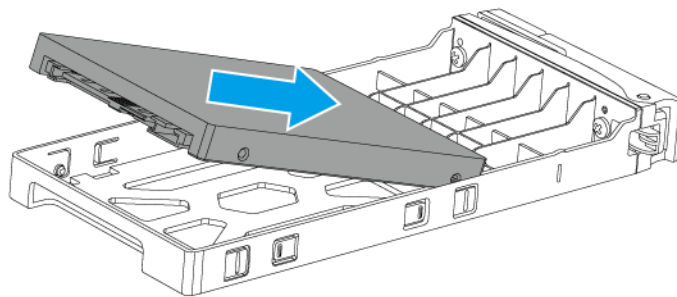


- ii. Place the 2.5" drive on the tray so that the SATA connector is facing out and that three holes on the bottom of the drive are aligned with three holes on the bottom of the tray.
- iii. Attach the screws to lock the drive to the tray.



c. SSD:

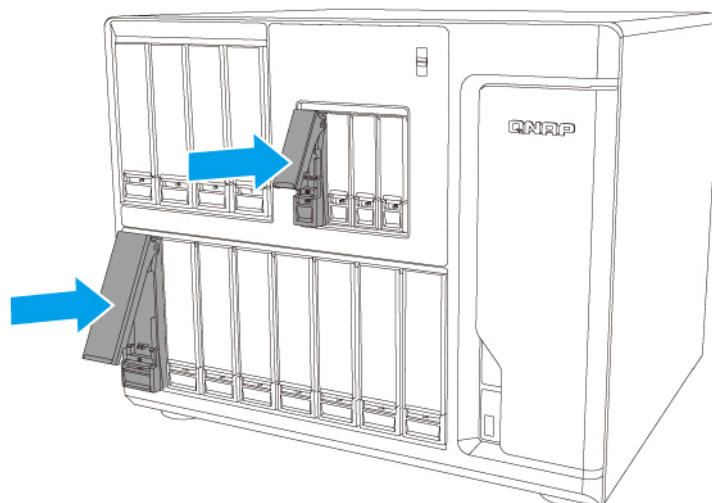
- i. Insert an SSD into an SSD tray so that SATA connector is perfectly aligned with the opening at end of the tray.



OR

Insert an SSD into a 3.5" drive tray using the same method as in 2b.

3. Load tray back into drive bay.
 - i. Insert the drive tray into the NAS. Verify that the tray is correctly oriented (top of HDD facing right) and fully pushed in.
 - ii. Close the latch, and lock the switch.



4. To verify that the drive has been correctly installed and recognized by the operating system, log into QTS as administrator and go to "Storage Manager" > "Storage" > "Disks/VJOB" and confirm the disk is in the System Component or NAS Host section.

6.3 RAID Recovery - Hot-Swapping Drives

The QNAP NAS supports hot-swapping drives. When one drive fails in RAID 1/5, up to two drives fail in RAID 6/RAID 10*, replacing failed drives with a healthy ones will automatically trigger QTS to rebuild the RAID. Follow the steps below to hot-swap drives when drive failures occur in a RAID configuration. See section 6.2 for detailed instructions on how to install a new drive.

* One drive each in the RAID 1 pair

Follow instructions below for hot-swapping:

1. Log into QTS as administrator and check the storage pool status in "Storage Manager" > "Storage" > "Storage Space". There will be a list of all available storage pools.

2. If one drive fails in RAID 1/5, up to two drives fail in RAID 6/RAID 10*, the storage pool status will be labeled as "Degraded" and the Volume/RAID group status should be labeled as "Warning".
3. Go to "Storage Manager" > "Storage" > "Disks/VJBOD" to determine which disk needs to be replaced.
4. Take out bad drive from NAS enclosure and remove the drive from the tray.
5. Install replacement drive onto tray.
Note: the capacity of the new drive must be equal to or greater than the capacity of the old drive.
7. Insert tray with drive installed into NAS.
Important: Wait for two beeps after removing the faulty drive before inserting replacement drive into NAS. The NAS should also beep twice after replacement drive is installed.
8. The volume should automatically rebuild. Go to "Storage Manager" > "Storage" > "Storage Space" to confirm.

6.4 RAID Recovery - Accidental Removal of a Healthy Drive

The QNAP NAS supports RAID recovery when a healthy drive is unexpectedly removed from a RAID 1/5/6 during hot-swapping or RAID 0/JBOD configuration in QTS. Note that RAID 10 does not support this feature.

When a healthy drive is unexpectedly removed from a RAID group, the status of the RAID will change to "Not active". To recover from an "Not active" status:

1. Re-insert all drives back into the NAS in its original order. This includes any bad drive(s) that will need to be replaced after recovery.
2. Log into QTS as administrator and go to "Storage Manager" > "Storage" > "Storage Space".
3. Double click on the affected Storage Pool to open the Storage Pool Management window.

- In the "Storage Pool Management" window, click on the "Manage" button and select "Recover".

The process will take about 60 seconds for QTS to complete. When recovery is completed, the RAID group should be restored to its initial status.

See chart below for RAID status during this process.

	Initial Status	Status After Healthy Drive is Removed	Status After Drive is Re-Inserted and Storage Pool is Recovered
RAID 0/JBOD	Ready	Not active	Ready
RAID 1/5/6	Ready	Degraded	Rebuilding
RAID 1/5/6	Degraded	Not active	Degraded

The chart below describes the events of an error when using RAID 5.

	RAID 5 (Minimum 3 Disks)	
	QTS	Standard
One drive fails	Degraded mode (may still read and write).	Degraded mode (may still read and write).
One drive fails and there are bad sectors found in the other drive(s)	Read only protect mode (for immediate data backup & drive replacement).	RAID crash.
2 drives fail	RAID crash.	RAID crash.

The chart below describes the events of an error when using RAID 6.

	RAID 6 (Minimum 4 Disks)	
	QTS	Standard
One or two drives drive fail	Degraded mode. (may still read and write).	Degraded mode. (may still read and write).
Two drives fail and there are bad sectors found in the other drive(s)	Read only protect mode (for immediate data backup & drive replacement).	RAID crash.
3 drives fail	RAID crash.	RAID crash.

Chapter 7. Using the LCD Panel

The NAS provides a handy LCD panel for users to perform disk configuration and view the system information.

When the NAS has started up, the server name and IP address will be shown.

N	A	S	5	F	4	D	E	3							
4	.	3	.	0	(2	0	1	7	0	2	1	4)	

After a few seconds, the panel will be automatically turned off. Then you can begin to configure settings or view system information.

N	A	S	5	F	4	D	E	3							
1	6	9	.	2	5	4	.	1	0	0	.	1	0	0	

Viewing and configuring system settings

When the name and firmware version of the NAS appear on the panel, press "ENTER" for two seconds to view the Main Menu, which will automatically disappear if no further actions are performed in ten seconds.

There are eight options on the Main Menu:

1. TCP/IP
2. Physical disk
3. Volume
4. System
5. Shut down
6. Reboot
7. Password
8. Back

1. TCP/IP

In TCP/IP, you can see the following information:

- LAN1 IP Address
 - LAN1 Subnet Mask
 - LAN1 Gateway
 - LAN 1 PRI. DNS
 - LAN 1 SEC. DNS
- (You can configure the above settings for every interface.)
- Enter Network Settings
 - ✓ Network Settings – DHCP

- ✓ Network Settings – Static IP*
- ✓ Network Settings – BACK
- Back to Main Menu

* In Network Settings – Static IP, users can configure the IP address, subnet mask, gateway, and DNS of LAN 1 and LAN 2.

2. Physical disk

In Physical disk, you can see the following options:

- Disk Info
- Back to Main Menu

Disk info shows the temperature and the capacity of the drive.

D	i	s	k	:	1	T	e	m	p	:	5	0	°	C
S	i	z	e	:	2	3	2	G	B					

3. Volume

This section shows the capacities of volumes and LUNs. You can view the name and capacity of a volume/LUN. If there are multiple volumes/LUNs, press "Select" to view the information of a specific volume/LUN.

D	a	t	a	V	o	l	1							
7	5	0	G	B										

L	U	N	_	0										
7	5	0	G	B										

4. System

This section shows the system temperature and the rotation speed of the system fan.

C	P	U	T	e	m	p	:	5	0	°	C		
S	y	s	T	e	m	p	:	5	5	°	C		

S	y	s	F	a	n	:	8	6	5	R	P	M		

5. Shut down

You can use this option to turn off the NAS. Press "SELECT", select "Yes", and then press "ENTER" to confirm.

6. Reboot

You can use this option to restart the NAS. Press "SELECT", select "Yes", and press "ENTER" to confirm.

7. Password

The default password for the LCD panel is empty. If you want to change the password, select "Yes" to continue..

C	h	a	n	g	e		P	a	s	s	w	o	r	d	
					Y	e	s		→	N	o				

You can enter up to 8 digits for your password.

Press "SELECT" to increment the digit and press "ENTER" to add a new digit.

After inputting your desired password, press "ENTER".

When the cursor moves next to "OK", press "ENTER" to confirm the password.

N	e	w		P	a	s	s	w	o	r	d	:			
2	3	4											→	O	K

V	e	r	i	f	Y		P	a	s	s	w	o	r	d	:
2	3	4											→	O	K

8. Back

Select this option to return to the main menu.

System Messages

When an error occurs, a message will appear on the LCD panel. Press “ENTER” to view the message and press “ENTER” again to go to the next message.

S y s t e m E r r o r !
P l s . C h e c k L o g s

System Message	Description
Sys. Fan Failed	The system fan fails
Sys. Overheat	The system is overheating
HDD Overheat	The drive is overheating
CPU Overheat	The CPU is overheating
Network Lost	Both LAN 1 and LAN 2 are disconnected in failover or load-balancing mode
LAN1 Lost	LAN 1 is disconnected
LAN2 Lost	LAN 2 is disconnected
HDD Failure	The drive failed
Vol1 Full	The volume is full
HDD Ejected	The drive is ejected
RX#3 HDD Ejected	A drive has been ejected from the expansion unit 3.
M.2 SSD Ejected	A M.2 SSD has been ejected and may be defective as hot-plugging is not supported for M.2 drives.
PCIe SSD Ejected	A PCIe SSD has been ejected and may be defective as hot-plugging is not supported for PCIe devices/
Vol1 Degraded	The volume is in degraded mode
Vol1 Unmounted	The volume is unmounted
Vol1 Nonactivate	The volume is not activated

System Startup

S Y S T E M B O O T I N G
> > >

There are several phases in the system startup process:

- System Booting: BIOS and hardware initialization, and system booting (no actions need to be performed)
- Loading Driver: Loading QTS and its drivers (no actions need to be performed)
- Mount Volume: Prepare volumes (no actions need to be performed)
- Starting Service: Starting NAS system services (no actions need to be

performed). Note that applications start only after the system finishes booting

For TS-1685, the LCD panel displays additional booting information after you power on the NAS:

B	I	O	S		X	X	X	X	X	X				
C	h	e	c	k	i	n	g		M	e	m	o	r	y

- BIOS XXXXXX – XXXXXX is the BIOS version, which can be used for technical support to help identify and resolve issues.
- Startup phases:
 - Checking Memory – The system checks the installed memory.
 - Powering up all disks – Power up all disks sequentially.
 - Hardware initialization – Initialize additional hardware components, such as PCIe SSD, Graphic card, Thunderbolt adapter, etc.
 - Booting - Boot from the DOM. If the startup stops at this step, the DOM may be defective. Please seek technical support.
 - Starting System – Starting QTS. If the startup stops at this step, the QTS installation may have encountered problems. Please seek technical support.
- The remaining startup phases are the same as those of other NAS models

Technical Support

QNAP provides dedicated online support and customer service via instant messenger.

Online Support: helpdesk.qnap.com

Forum: <http://forum.qnap.com>

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Version 3, 29 June 2007

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