QNAP Turbo NAS

Hardware User Manual

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:
HS-210, HS-251, HS-251+, TS-112P, TS-131, TS-131P, TS-212P, TS-231, TS-231P, TS-231+, TS-251, TS-251+, TS-251C, TS-251A, TS-253 Pro, TS-431, TS-431P, TS-431+, TS-431U, TS-451, TS-451+, TS-451S, TS-451U, TS-451A, TS-453 Pro, TS-453S Pro (formerly SS-453 Pro), TS-453U, TS-453U-RP, TS-463U, TS-463U-RP, TVS-463, TS-470U-SP/RP, TVS-473, TS-531P, TS-563, TS-651, TS-653 Pro, TVS-663, TS-531X, TVS-673, TS-831X, TS-851, TS-853 Pro, TS-853S Pro (formerly SS-853 Pro), TS-853U, TS-853U-RP, TS-863U, TS-863U-RP, TVS-863, TVS-863+, TVS-882ST, TS-870U-RP, TVS-873, TS-879 Pro, TS-879U-RP, TS-EC879U-RP, TS-1079 Pro, TS-1253U, TS-1253U-RP, TS-1263U, TS-1263U-RP, TS-1270U-RP, TS-1279U-RP, TS-EC1279U-RP, TS-1635, TS-1679U-RP, TS-EC1679U-RP, IS-453S, TS-453Bmini, TS-453mini, TAS-168, TAS-268, TS-253A, TS-453A, TS-653A, TS-853A, TS-128, TS-228, TBS-453A

NOTE

- The "Turbo NAS"& "Turbo vNAS" are 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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DISCLAIMER

In no event shall QNAP Systems, Inc. (QNAP) liability exceed the price paid for the product from direct, indirect, special, incidental, or consequential damages resulting from the use of the product, its accompanying software, or its documentation. QNAP makes no warranty or representation, expressed, implied, or statutory, with respect to its products or the contents or use of this documentation and all accompanying software, and specifically disclaims its quality, performance, merchantability, or fitness for any particular purpose. QNAP reserves the right to revise or update its products, software, or documentation without obligation to notify any individual or entity.

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 Notice

QNAP NAS comply with different FCC compliance classes. Please refer the Appendix for details. Once the class of the device is determined, refer to the following corresponding statement.

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FCC Class A Notice

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.
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 A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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.

A 급기기
(업무용정보통신기기)

이기기는업무용으로전자파적합등록을한기기이오니, 판매자또는사용자는이점을주위하시기바라며, 만약잘못판매또는구입하였을때에는가정용으로교환하시기바랍니다.

FCC Class B Notice

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.
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.

CE NOTICE

QNAP NAS comply with different CE compliance classes. Please refer to the Appendix for details.

SJ/T 11364-2006

本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有”环境友好使用期限”的标签，此期限是估算这些物质”不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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 a temperature range of 0ºC–40ºC (or up to 35ºC depending on individual product specifications)with relative humidity of 0%–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 chassis NAS models 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. CPU and Memory Specifications

Caution: Modifying the hardware, software, or firmware of the QNAP products will void the warranty. QNAP is not responsible for any form of damage or loss of data caused by modding the QNAP products. Users should bear their own risks of all sorts of possible data loss or system instabilities due to changing the hardware parts, modifying the default system firmware or installing any unauthorized third party applications on QNAP products.

System	**TS-112P**	**TS-212P**
CPU	Marvell 1.6GHz	Marvell 1.6GHz
CPU architecture	ARM	ARM
Memory	512MB DDR2	512MB DDR2
Flash	16MB	16MB
Memory replaceable	-	-
Number of RAM slots	-	-
Number of hard drive slots	1	2

System	**TS-128**	**TS-228**
CPU	Dual-core ARM®v7 1.1GHz	Dual-core ARM®v7 1.1GHz
CPU architecture	ARM	ARM
Memory	1GB DDR3	1GB DDR3
Flash	4GB	4GB
Memory replaceable	-	-
Number of RAM slots	-	-
Number of hard drive slots	1 (3.5” HDDs only)	2 (3.5” HDDs only)

System	TAS-168	TAS-268
CPU	Dual-core Realtek 1.1GHz	Dual-core Realtek 1.1GHz
CPU architecture	ARM	ARM
Memory	2GB DDR3	2GB DDR3
Flash	4GB	4GB
Memory replaceable	-	-
Number of RAM slots	-	-
Number of hard drive slots	1 (3.5” HDDs only)	2 (3.5” HDDs only)
IR sensor	✔(QNAP remote control: RM-IR003)	✔(QNAP remote control: RM-IR003)

System	TS-131	TS-231
CPU	Dual-core Freescale™ 1.2GHz	Dual-core Freescale™ 1.2GHz
CPU architecture	ARM	ARM
Memory	512MB DDR3	512MB DDR3
Flash	512MB	512MB
Memory replaceable	-	-
Number of RAM slots	-	-
Number of hard drive slots	1	2

System	TS-431	TS-431U
CPU	Dual-core Freescale™ 1.2GHz	Dual-core Freescale™ 1.2GHz
CPU architecture	ARM	ARM
Memory	512MB DDR3	1GB DDR3
Flash	512MB	512MB
Memory replaceable	-	-
Number of RAM slots	-	-
Number of hard drive slots	4	4

System	TS-231+	TS-431+
CPU	Annapurna Labs Alpine AL-212 Dual-core 1.4GHz Cortex-A15	Annapurna Labs Alpine AL-212 Dual-core 1.4GHz Cortex-A15
CPU architecture	ARM	ARM
Memory	1GB DDR3	1GB DDR3
Flash	512MB	512MB
Memory replaceable	-	-
Number of RAM slots	-	-
Number of hard drive slots	2	4
PCI-E expansion slot	-	-
Built-in 10GbE LAN ports	-	-

System	TS-531P	TS-531X	TS-831X
CPU	Quad-core Annapurna Labs Alpine AL-314 1.4GHz Cortex-A15	Quad-core Annapurna Labs Alpine AL-314 1.4GHz Cortex-A15	Quad-core Annapurna Labs Alpine AL-314 1.4GHz Cortex-A15
CPU architecture	ARM	ARM	ARM
Memory	2GB/8GB DDR3 (Expandable RAM, up to 16GB)	2GB/8GB DDR3 (Expandable RAM, up to 16GB)	8GB/16GB DDR3 (Expandable RAM, up to 16GB)
Flash	512MB	512MB	512MB
Memory replaceable	✔ (Compatible with DDR3 RAM)	✔ (Compatible with DDR3 RAM)	✔ (Compatible with DDR3 RAM)
Number of RAM slots	2 (SODIMM)	2 (SODIMM)	2 (SODIMM)
Number of hard drive slots	5	5	8
PCI-E expansion slot	1	1	1
Built-in 10GbE LAN ports	-	2 x SFP+	2 x SFP+

System	TS-131P	TS-231P	TS-431P
CPU	Annapurna Labs Alpine AL-212 Dual-core 1.7GHz Cortex-A15	Annapurna Labs Alpine AL-212 Dual-core 1.7GHz Cortex-A15	Annapurna Labs Alpine AL-212 Dual-core 1.7GHz Cortex-A15
CPU architecture	ARM	ARM	ARM
Memory	1GB DDR3	1GB DDR3	1GB DDR3
Flash	512MB	512MB	512MB
Memory replaceable	-	-	
Number of RAM slots	-	-	
Number of hard drive slots	1	2	4
PCI-E expansion slot	-	-	
Built-in 10GbE LAN ports	-	-	

System	TS-1635	HS-210
CPU	Quad-core Annapurna Labs Alpine AL-514 1.7GHz Cortex-A15	Marvell 1.6GHz
CPU architecture	ARM	ARM
Memory	8GB/16GB DDR3 (Expandable RAM, up to 16GB)	512MB DDR3
Flash	512MB	16MB
Memory replaceable	✔ (Compatible with DDR3 RAM)	-
Number of RAM slots	2 (SODIMM)	-
Number of hard drive slots	16	2
PCI-E expansion slot	1	
Built-in 10GbE LAN ports	2 x SFP+	

System	TS-451U	TS-453U	TS-453U-RP
CPU	Dual-core Intel® Celeron™ 2.41GHz (up to 2.58GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)
CPU architecture	x86	x86	x86
Memory	1GB DDR3L (Expandable RAM, up to 8GB)	4GB/8GB DDR3L (Expandable RAM, up to 8GB)	4GB/8GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB (USB DOM)	512MB (USB DOM)	512MB (USB DOM)
Memory replaceable	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L RAM)	✔ (Compatible with DDR3L RAM)
Number of RAM slots	2 (SODIMM)	2 (SODIMM)	2 (SODIMM)
Number of hard drive slots	4	4	4
Power supply unit	250W	250W	2 x 250W

System	TS-853U	TS-853U-RP
CPU	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)
CPU architecture	x86	x86
Memory	4GB/8GB DDR3L (Expandable RAM, up to 8GB)	4GB/8GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB (USB DOM)	512MB (USB DOM)
Memory replaceable	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L RAM)
Number of RAM slots	2 (SODIMM)	2 (SODIMM)
Number of hard drive slots	8	8
Power supply unit	250W	2 x 250W

System	TS-1253U	TS-1253U-RP
CPU	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)
CPU architecture	x86	x86
Memory	4GB/8GB DDR3L (Expandable RAM, up to 8GB)	4GB/8GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB (USB DOM)	512MB (USB DOM)
Memory replaceable	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L RAM)
Number of RAM slots	2 (SODIMM)	2 (SODIMM)
Number of hard drive slots	12	12
Power supply unit	250W	2 x 250W

System	IS-453S
CPU	Quad-core Intel® Atom™ 1.91GHz
CPU architecture	x86
Memory	IS-453S-2G: 2GB DDR3L IS-453S-8G: 8GB DDR3L
Flash	512MB (USB DOM)
CPU replaceable	-
Memory replaceable	✓ (Compatible with DDR3L-1333/1600S ODIMM RAM)
Number of RAM slots	2 (SODIMM)
Number of hard drive slots	4 (2.5" only)

System	TS-251C	TS-251/ TS-251-4G	TS-251A-2G / TS-251A-4G
CPU	Dual-core Intel® Celeron™ 2.41GHz (up to 2.58GHz)	Dual-core Intel® Celeron™ 2.41GHz (up to 2.58GHz)	Dual-core Intel® Celeron™ 1.6GHz (up to 2.48GHz)
CPU architecture	x86	x86	x86
Memory	1GB DDR3L	1GB / 4GB DDR3L (Expandable RAM, up to 8GB)	2GB / 4GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB	512MB	512MB
Memory replaceable	-	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L-1600 RAM)
Number of RAM slots	-	2(SODIMM)	2(SODIMM)
Number of hard drive slots	2 (3.5” HDDs only)	2	2
IR sensor	✓(QNAP remote control: RM-IR002)	✔(QNAP remote control: RM-IR002)	✔(QNAP remote control: RM-IR002)

System	TS-451 / TS-451-4G	TS-451A-2G / TS-451A-4G	TS-451S
CPU	Dual-core Intel® Celeron™ 2.41GHz (up to 2.58GHz)	Dual-core Intel® Celeron™ 1.6GHz (up to 2.48GHz)	Dual-core Intel® Celeron™ 2.41GHz (up to 2.58GHz)
CPU architecture	x86	x86	x86
Memory	1GB / 4GB DDR3L (Expandable RAM, up to 8GB)	2GB / 4GB DDR3L (Expandable RAM, up to 8GB)	1GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L-1600 RAM)	✓ (Compatible with DDR3L RAM)
Number of RAM slots	2 (SODIMM)	2(SODIMM)	2 (SODIMM)
Number of hard drive slots	4	2	4 (2.5” only)
IR sensor	✓ (QNAP remote control: RM-IR002)	✔(QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	TS-651 / TS-651-4G	TS-851 / TS-851-4G
CPU	Dual-core Intel® Celeron™ 2.41GHz (up to 2.58GHz)	Dual-core Intel® Celeron™ 2.41GHz (up to 2.58GHz)
CPU architecture	x86	x86
Memory	1GB / 4GB DDR3L (Expandable RAM, up to 8GB)	1GB / 4GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L RAM)
Number of RAM slots	2 (SODIMM)	2 (SODIMM)
Number of hard drive slots	6	8
IR sensor	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	HS-251+	HS-251 / HS-251-2G
CPU	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Dual-core Intel® Celeron™ 2.41GHz (up to 2.58GHz)
CPU architecture	x86	x86
Memory	2GB DDR3L	1GB / 2GB DDR3L
Flash	512MB	512MB
CPU replaceable	-	-
Memory replaceable	-	-
Number of RAM slots	-	-
Number of hard drive slots	2	2
IR sensor	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	TBS-453A-4G/ TBS-453A-4G-1TB /TBS-453A-4G-512GB	TBS-453A-8G/ TBS-453A-8G-1TB /TBS-453A-8G-512GB
CPU	Quad-core Intel® Celeron™ N3150 1.6GHz (up to 2.08GHz)	Quad-core Intel® Celeron™ N3150 1.6GHz (up to 2.08GHz)
CPU architecture	x86	x86
Memory	4GB DDR3L	8GB DDR3L
Flash	4GB	4GB
CPU replaceable	-	-
Memory replaceable	✔(Compatible with DDR3L RAM)	✔(Compatible with DDR3L RAM)
Number of RAM slots	2 (SODIMM)	2 (SODIMM)
Number of hard drive slots	4	4
IR sensor	✔(QNAP remote control: RM-IR002 & RM-IR003)	✔(QNAP remote control: RM-IR002 & RM-IR003)

System	TS-251+-2G / TS-251+-8G	TS-253 Pro / TS-253 Pro-8G
CPU	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)
CPU architecture	x86	x86
Memory	2GB / 8GB DDR3L (Expandable RAM, up to 8GB)	2GB / 8GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L-1333/1600 RAM)	✓ (Compatible with DDR3L-1333/1600 RAM)
Number of RAM slots	2(SODIMM)	2(SODIMM)
Number of hard drive slots	2	2
IR sensor	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	TS-453Bmini-4G / TS-453Bmini-8G	TS-453mini-2G / TS-453mini-8G
CPU	Quad-core Intel® Celeron™ J3455 1.5 GHz (up to 2.3 GHz)	Quad-core Intel® Celeron™ J1900 2.0GHz (up to 2.42GHz)
CPU architecture	x86	x86
Memory	4GB / 8GB DDR3L (Expandable RAM, up to 8GB)	2GB / 8GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB	512MB
Memory replaceable	✔(Compatible with DDR3L RAM)	✓ (Compatible with DDR3L-1333/1600 RAM)
Number of RAM slots	2 (SODIMM)	2 (SODIMM)
Number of hard drive slots	4	4
IR sensor	✔(QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	TS-451+-2G / TS-451+-8G	TS-453 Pro / TS-453 Pro-8G	TS-653 Pro / TS-653 Pro-8G
CPU	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)
CPU architecture	x86	x86	x86
Memory	2GB / 8GB DDR3L (Expandable RAM, up to 8GB)	2GB / 8GB DDR3L (Expandable RAM, up to 8GB)	2GB / 8GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L RAM)
Number of RAM slots	2 (SODIMM)	2 (SODIMM)	2 (SODIMM)
Number of hard drive slots	4	4	6
LCD panel	-	✓	✓
IR sensor	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	TS-853 Pro / TS-853 Pro-8G	TS-453S Pro (Formerly the SS-453 Pro)	TS-853S Pro(Formerly the SS-853 Pro)
CPU	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)	Quad-core Intel® Celeron™ 2.0GHz (up to 2.42GHz)
CPU architecture	x86	x86	x86
Memory	2GB / 8GB DDR3L (Expandable RAM, up to 8GB)	4GB DDR3L (Expandable RAM, up to 8GB)	4GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L RAM)	✓ (Compatible with DDR3L RAM)
Number of RAM slots	2(SODIMM)	2(SODIMM)	2(SODIMM)
Number of hard drive slots	8	4 (2.5” only)	8 (2.5” only)
LCD panel	✓	-	✓
IR sensor	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	TS-563-4G / TS-563-8G	TVS-463-4G / TVS-463-8G	TVS-663-4G / TVS-663-8G
CPU	Quad-core AMD 2.0GHz	Quad-core AMD 2.4GHz	Quad-core AMD 2.4GHz
CPU architecture	x86	x86	x86
Memory	4/8 GB DDR3L (Expandable RAM, up to 16GB)	4/8 GB DDR3L (Expandable RAM, up to 16GB)	4/8 GB DDR3L (Expandable RAM, up to 16GB)
Flash	512MB	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L-1600 RAM)	✓ (Compatible with DDR3L-1600 RAM)	✓ (Compatible with DDR3L-1600 RAM)
Number of RAM slots	2(SODIMM)	2(SODIMM)	2(SODIMM)
Number of hard drive slots	5	4	6
PCI-E expansion slot	1	1	1
HDMI	-	✓	✓
LCD panel	-	✓	✓
IR sensor	-	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	TVS-863-4G / TVS-863-8G	TVS-863+-8G / TVS-863+-16G
CPU	Quad-core AMD 2.4GHz	Quad-core AMD 2.4GHz
CPU architecture	x86	x86
Memory	4/8 GB DDR3L (Expandable RAM, up to 16GB)	8/16 GB DDR3L (Expandable RAM, up to 16GB)
Flash	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L-1600 RAM)	✓ (Compatible with DDR3L-1600 RAM)
Number of RAM slots	2(SODIMM)	2(SODIMM)
Number of hard drive slots	8	8
PCI-E expansion slot	1	1 (Pre-installed 1-port 10GbE NIC)
HDMI	✓	✓
LCD panel	✓	✓
IR sensor	✓ (QNAP remote control: RM-IR002)	✓ (QNAP remote control: RM-IR002)

System	TVS-882ST-i5-8G	TVS-882ST-i7-16G
CPU	Quad-core Intel® Core™ i5 1.9GHz	Quad-core Intel® Core™ i7 2.6GHz
CPU architecture	x86	x86
Memory	8GB DDR4 (Expandable RAM, up to 32GB)	16GB DDR4 (Expandable RAM, up to 32GB)
Flash	512MB	512MB
Memory replaceable	✔ (Compatible with DDR3L-1600 RAM)	✔ (Compatible with DDR3L-1600 RAM)
Number of RAM slots	2(SODIMM)	2(SODIMM)
Number of drive slots	8	8
PCI-E expansion slot	1	1 (Pre-installed 1-port 10GbE NIC)
HDMI	✔	✔
LCD panel	✔	✔
IR sensor	✔(QNAP remote control: RM-IR002)	✔(QNAP remote control: RM-IR002)

System	TS-253A-4G / TS-253A -8G	TS-453A -4G / TS-453A -8G	TS-653A -4G / TS-653A -8G
CPU	Quad-core Intel® Celeron® N3150 1.6GHz (up to 2.08GHz)	Quad-core Intel® Celeron® N3150 1.6GHz (up to 2.08GHz)	Quad-core Intel® Celeron® N3150 1.6GHz (up to 2.08GHz)
CPU architecture	x86	x86	x86
Memory	4/8 GB DDR3L (Expandable RAM, up to 8GB)	4/8 GB DDR3L (Expandable RAM, up to 8GB)	4/8 GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB	512MB	512MB
Memory replaceable	✔(Compatible with DDR3L-1600 RAM)	✔(Compatible with DDR3L-1600 RAM)	✔(Compatible with DDR3L-1600 RAM)
Number of RAM slots	2(SODIMM)	2(SODIMM)	2(SODIMM)
Number of hard drive slots	2	4	6
PCI-E expansion slot	-	-	-
HDMI	2	2	2
LCD panel	-	✔	✔
IR sensor	✔(QNAP remote control: RM-IR002)	✔(QNAP remote control: RM-IR002)	✔(QNAP remote control: RM-IR002)

System	**TS-853A -4G / TS-853A -8G**
CPU	Quad-core Intel® Celeron® N3150 1.6GHz (up to 2.08GHz)
CPU architecture	x86
Memory	4/8 GB DDR3L (Expandable RAM, up to 8GB)
Flash	512MB
Memory replaceable	✔(Compatible with DDR3L-1600 RAM)
Number of RAM slots	2(SODIMM)
Number of hard drive slots	8
PCI-E expansion slot	-
HDMI	2
LCD panel	✔
IR sensor	✔(QNAP remote control: RM-IR002)

System	TVS-882-i5-8G	TVS-882-i7-16G
CPU	Quad-core Intel® Core™ i5 1.9GHz	Quad-core Intel® Core™ i7 2.6GHz
CPU architecture	x86	x86
Memory	8GB DDR4 (Expandable RAM, up to 32GB)	16GB DDR4 (Expandable RAM, up to 32GB)
Flash	512MB	
Memory replaceable	✔(Compatible with DDR4 RAM)	
Number of RAM slots	2(SODIMM)	
Number of drive slots	8 x 2.5” SATA 6Gb/s	
PCI-E expansion slot	1 x PCIe Gen3 (x8) + 1 x PCIe Gen3 (x4)	
HDMI	1	
LCD panel	✔	
IR sensor	✔(QNAP remote control: RM-IR002)	
Thunderbolt	2 x Thunderbolt™ 2 ports	
10GbE LAN	2 x 10GbE SFP+ LAN ports	

System	TVS-882ST-i5-8G	TVS-882ST-i7-16G
CPU	Quad-core Intel® Core™ i5 1.9GHz	Quad-core Intel® Core™ i7 2.6GHz
CPU architecture	x86	x86
Memory	8GB DDR4 (Expandable RAM, up to 32GB)	16GB DDR4 (Expandable RAM, up to 32GB)
Flash	512MB	
Memory replaceable	✔(Compatible with DDR4 RAM)	
Number of RAM slots	2(SODIMM)	
Number of drive slots	8 x 2.5” SATA 6Gb/s	
PCI-E expansion slot	1 x PCIe Gen3 (x8) + 1 x PCIe Gen3 (x4) Note: These two expansion slots are occupied by a Thunderbolt™ 2 and a USB 3.1 expansion card..	
HDMI	1	
LCD panel	✔	
IR sensor	✔(QNAP remote control: RM-IR002)	
Thunderbolt	2 x Thunderbolt™ 2 ports	
10GbE LAN	2 x 10GbE SFP+ LAN ports	

System	TS-463U	TS-463U-RP	TS-863U
CPU	Quad-core AMD 2.0GHz	Quad-core AMD 2.0GHz	Quad-core AMD 2.0GHz
CPU architecture	x86	x86	x86
Memory	4 GB DDR3L (Expandable RAM, up to 16GB)	4 GB DDR3L (Expandable RAM, up to 16GB)	4 GB DDR3L (Expandable RAM, up to 16GB)
Flash	512MB	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L-1600 RAM)	✓ (Compatible with DDR3L-1600 RAM)	✓ (Compatible with DDR3L-1600 RAM)
Number of RAM slots	2(SODIMM)	2(SODIMM)	2(SODIMM)
Number of hard drive slots	4	4	8
PCI-E expansion slot	1 (Pre-installed LAN-10G1SR-D NIC)	1 (Pre-installed LAN-10G1SR-D NIC)	1 (Pre-installed LAN-10G1SR-U NIC)
HDMI	-	-	-
LCD panel	-	-	-

System	TS-863U-RP	TS-1263U	TS-1263U-RP
CPU	Quad-core AMD 2.0GHz	Quad-core AMD 2.0GHz	Quad-core AMD 2.0GHz
CPU architecture	x86	x86	x86
Memory	4 GB DDR3L (Expandable RAM, up to 16GB)	4 GB DDR3L (Expandable RAM, up to 16GB)	4 GB DDR3L (Expandable RAM, up to 16GB)
Flash	512MB	512MB	512MB
Memory replaceable	✓ (Compatible with DDR3L-1600 RAM)	✓ (Compatible with DDR3L-1600 RAM)	✓ (Compatible with DDR3L-1600 RAM)
Number of RAM slots	2(SODIMM)	2(SODIMM)	2(SODIMM)
Number of hard drive slots	8	12	12
PCI-E expansion slot	1 (Pre-installed LAN-10G1SR-U NIC)	1 (Pre-installed LAN-10G1SR-U NIC)	1 (Pre-installed LAN-10G1SR-U NIC)
HDMI	-	-	-
LCD panel	-	-	-

System	TVS-473	TVS-673	TVS-873
CPU	AMD R-Series RX-421BD 2.1 GHz APU, Turbo Core up to 3.4 GHz		
CPU architecture	x86		
Memory	8GB DDR4 (Expandable RAM, up to 64GB)	16GB DDR4 (Expandable RAM, up to 64GB)	64GB DDR4 (Expandable RAM, up to 64GB)
Flash	512MB		
Memory replaceable	✔(Compatible with DDR4 RAM)		
Number of RAM slots	4 (SODIMM)		
Number of drive slots	4 x 3.5”/2.5” SATA 6Gb/s	6 x 3.5”/2.5” SATA 6Gb/s	8 x 3.5”/2.5” SATA 6Gb/s /s
PCI-E expansion slot	2 x PCIe Gen3 (x4) *One slot is pre-installed with a dual-port USB 3.1 PCIe card.		
HDMI	2		
LCD panel	✔		
IR sensor	✔(QNAP remote control: RM-IR004)		
USB 3.1	2 x USB 3.1 Gen 2 Ports		

Chapter 2. Power Button and Reset Button Behavior

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

System	Power button (Turn on)	Power button (Hardware turn off)	Power button (Force turn off)
ARM models	Press once	5 sec	10 sec
x86 models	Press once	1.5 sec	5 sec

- 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 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

*This feature is only provided by the NAS models with LCD panels. Please visit http://www.qnap.comfor details.

Advanced system reset (10 sec)

Press and hold the reset button for 10 seconds. You will hear two beeps; one at the three second mark and another at the ten second marks. The NAS will reboot and reset the system settings back to default. Settings such as users, user groups, and the network share folders previously created will be cleared. Default network shares will be restored (not applicable to 1-bay NAS models). To retrieve the old data after the advanced system reset, recreate the same network share folders on the NAS and the data will be accessible again.

Chapter 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 to or from a USB device using the front one touch copy button. To use this function, follow the steps below:

1. Make sure at least one hard drive is installed and configured on the NAS.

2. Configure the behavior of the one touch copy button on "Backup Station/ Hybrid Backup Sync" > "External Backup" > "USB One Touch Copy".

3. Connect the USB storage device to the front USB port on the NAS.

4. Press the one touch copy button. The USB LED will flash. The data will be backed up.

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.

Chapter 4. LED and Alarm Buzzer Specifications

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 hard drive, and connected the NAS to the network and the power supply.

LED	Color	LED Status	Description
System Status	Red/ Green	Flashes green and red alternately every 0.5 sec	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	1. The hard 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 hard 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	1. The NAS is starting up. 2. The NAS is not configured. 3. A hard disk drive is not formatted.
		Flashes green every 2 seconds	The NAS is in S3 sleep mode[1].
		Green	The NAS is ready.
		Off	All the hard disk drives on the NAS are in standby mode.

[1]This feature is only available on certain NAS models. Please refer to the product specification table for details at www.qnap.com.

LED	Color	LED Status	Description
LAN	Orange	Orange	The disk data is being accessed from the network and a read/write error occurs during the process.
		Flashes orange	The NAS is being accessed from the network.
10GbE[2]	Green	Green	The 10GbE network expansion card is installed.
		Off	No 10GbE network expansion card is installed.
HDD3	Red/ Green	Flashes red	The disk data is being accessed and a read/write error occurs during the process.
		Red	A hard disk drive read/write error occurs.
		Flashes green	The disk data is being accessed.
		Green	The hard disk drive can be accessed.
USB3	Blue	Flashes blue every 0.5 sec	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. 4. The data is being copied to or from the external USB or eSATA device.
		Blue	A front USB device is detected (after the device is mounted).
		Off	1. No USB device is detected. 2. The NAS has finished copying the data to or from the USB device connected to the front USB port.
eSATA[3]	Orange	Flashes	The eSATA device is being accessed.
		Off	No eSATA device can be detected.

[2] The 10 GbE network expansion function is only supported certain NAS models. Please refer to the product specification table for details at www.qnap.com.
[3]This feature is only available on certain NAS models. Please refer to the product specification table for details at www.qnap.com.

Beep alarm (for all NAS models)

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

Beep sound	Number of Times	Description
Short beep (0.5 sec)	1	1. The NAS is starting up. 2. The user presses the reset button to reset the NAS. 3. The system firmware has been updated.
Short beep (0.5 sec)	3	The user tries to copy the NAS data to the external storage device from the front USB port, but the data cannot be copied.
Long beep (1.5 sec)	3, every 5 min	The system fan is out of function.
Long beep (1.5 sec)	2	1. The NAS was powered off by force shutdown (hardware shutdown and applicable to ARM models only). 2. The disk volume is going to be full. 3. The disk volume has reached its full capacity. 4. The hard drives on the NAS are in degraded mode. 5. The user starts the hard drive rebuilding process. 6. A hard drive is plugged in or out.
	1	1. The NAS is powering off 2. The NAS has been turned on successfully and is ready.

Chapter 5. Upgrade Memory on QNAP Turbo NAS (RAM Module Installation)

Warning:

- The following instructions should only be performed by an authorized and trained technician.
- Strictly adhere to the instructions to install a RAM module on the NAS. Failure to do so could result in injury to human body or 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 different RAM modules (optional purchase) through its resellers for users to upgrade the NAS memory. Use of non-QNAP RAM modules may cause system instability. Follow the below steps to install an extra memory module on the NAS to upgrade the memory.

Follow the steps below to install a RAM module on the NAS.

6.1 TS-453Bmini, TS-453mini (4-bay)

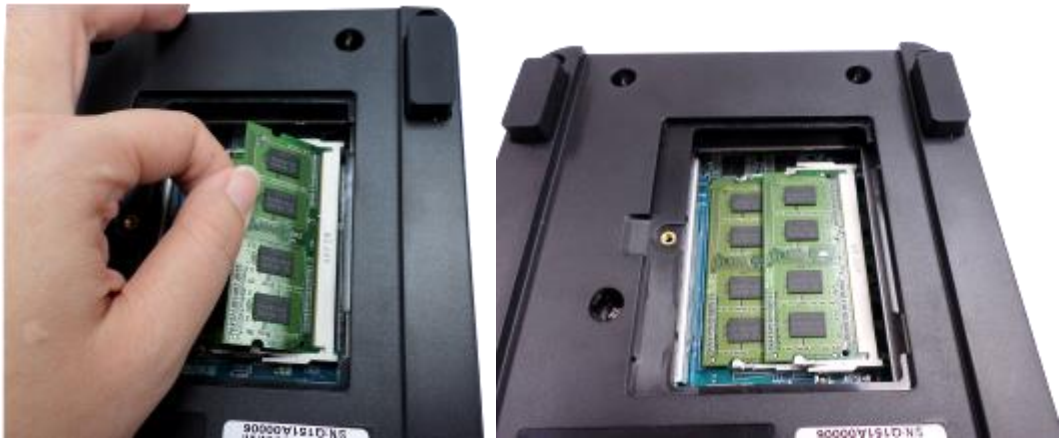
1. Use a flathead screwdriver to loosen the screw on the memory module compartment at the bottom of the NAS and lift the compartment cover away.

2. To remove installed memory modules, pull the retention clips on each side so that the module tilts up for easy removal.

Note: Always ensure that a memory module is installed in the Primary (red) slot. If not, then the system will fail to start. The maximum supported memory is 8GB combined.

3. Slide the memory module to the slot at a 45-degree angle (approximately) and press the memory module down until it clips into place. Ensure the memory module sits

properly with the clips in place.



4. Close the NAS cover and fasten the screw. Reconnect the power and network cables to the NAS.

6.2 TBS-453A

1. Remove the rubber feet and loosen the four hand screws on the bottom of the NAS. Then lift the compartment cover away.

2. To remove installed memory modules, pull the retention clips on each side so that the module tilts up for easy removal.

Note: Always ensure that a memory module is installed in the Primary (red) slot. If not, then the system will fail to start. The maximum supported memory is 8GB combined.

3. Slide the memory module to the slot at a 45-degree angle (approximately) and press the memory module down until it clips into place. Ensure the memory module sits properly with the clips in place.

4. Close the NAS cover, fasten the four hand screws, and replace the rubber feet. Reconnect the power and network cables to the NAS.

5.3 TS-451S, TS-531P, TS-531X, TS-651, TS-831X, TS-851, TS-x53/x53S Pro, TS-563, TVS-882S, TVS-882ST, TVS-x63, TS-x53Aseries (2/4/6/8-bay)

1. Loosen the three screws on the rear of the NAS.

2. Remove the case cover of the NAS gently.

3. Locate the memory slot. Make sure the slot is empty.

Note: For TS-x53/x53S Pro, TS-451S, TS-531P, TS-651, TS-851 and TS-x53A models, always ensure that a memory module is installed in the Primary slot (red). If not, then the system will fail to start. The maximum supported memory is 8GB combined.

4. Grasp the edge of the memory module. Align the notch on the gold edge of the module

with the notch in the memory slot. Slide the memory module to the slot at a 45-degree angle (approximately).

5. Gently press the memory module into the slot until it is seated fully.

6. Rotate the memory module towards the motherboard until the securing clips clicks into place.

7. Close the case cover and fasten the screws. Connect the power adaptor and cables back to the NAS.

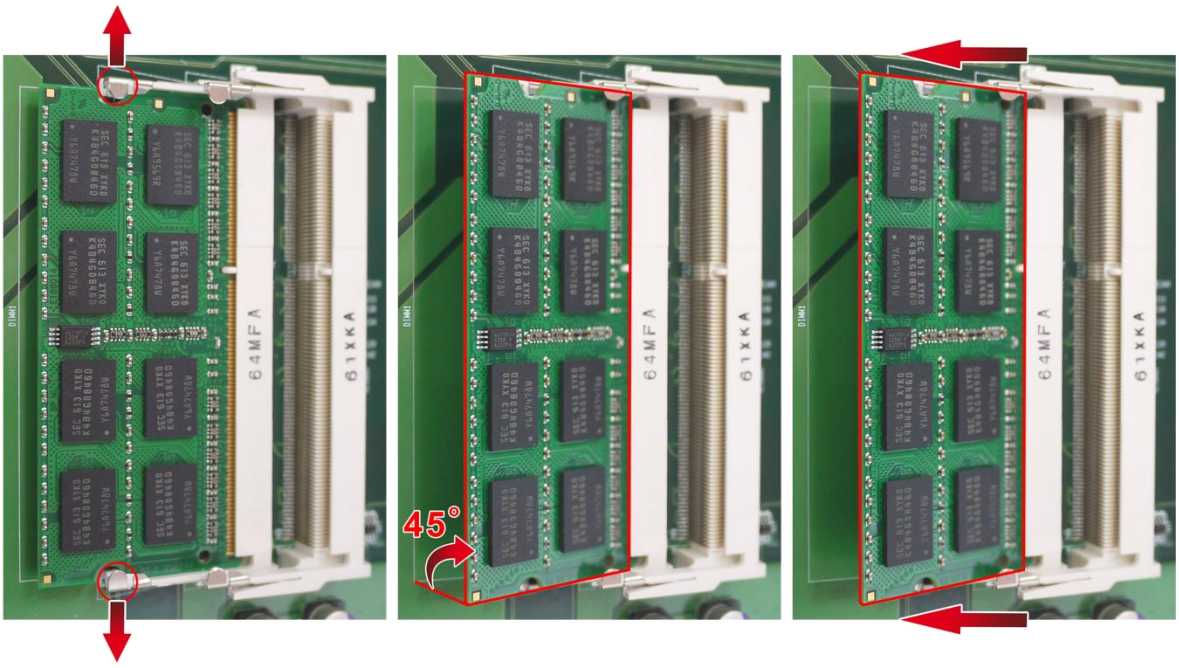
8. To check that the memory module is recognized by the NAS, power up the NAS and login the web interface as an administrator. Go to "System Status">"System Information" and check the total memory in "Hardware Information".

5.4 TS-1635

1. Loosen the screws on the back of the NAS that are connecting the case cover to the case.

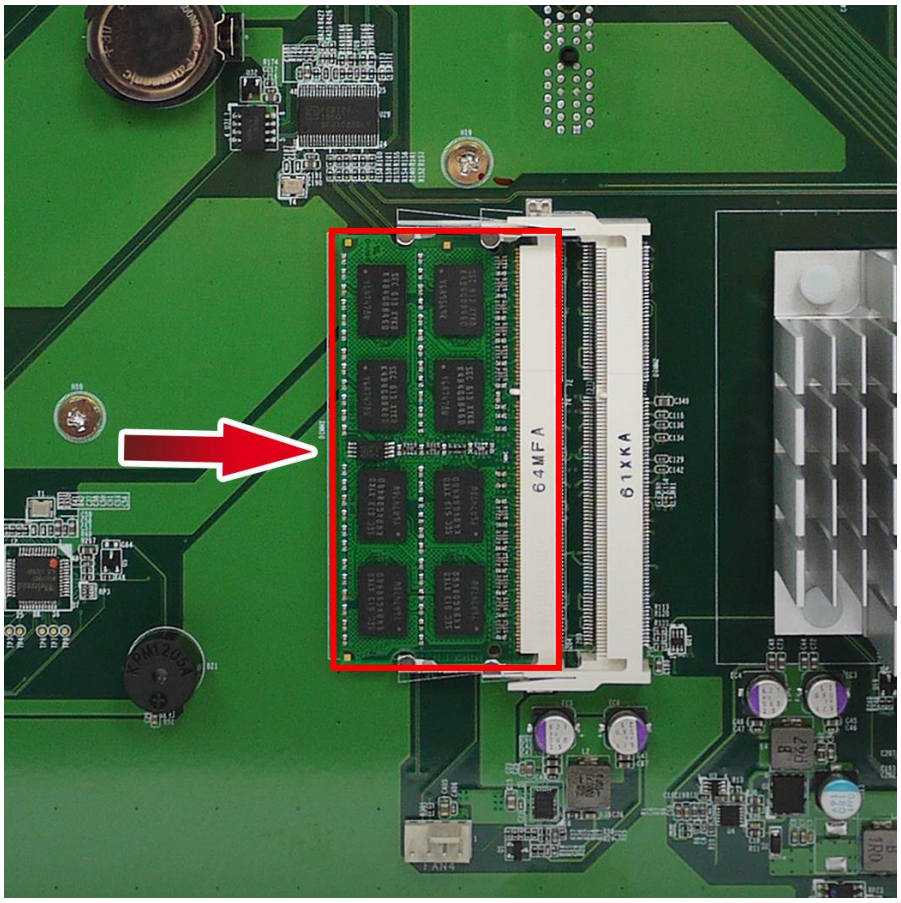
2. Gently remove case cover from case.

3. To remove installed memory modules, gently pull the retention clips outwards on each side so that the module tilts up at a 45-degree angle for easy removal. Remove module.



4. Hold the memory module by grasping its edges. Align the notch on the RAM module with the ridge in the memory socket. Slide the memory module into the socket at a 45-degree angle. Ensure that the module is firmly inserted into slot.

Note: Memory module must be installed in the primary slot (red outline in photo). System will fail to start if primary slot is empty. The maximum supported memory per slot is 8GB.



5. Gently push the memory module towards the motherboard until the retention clips lock the memory module in place.

6. Close the case cover and fasten the screws. Connect the power adaptor and cables to the NAS. Power on NAS.

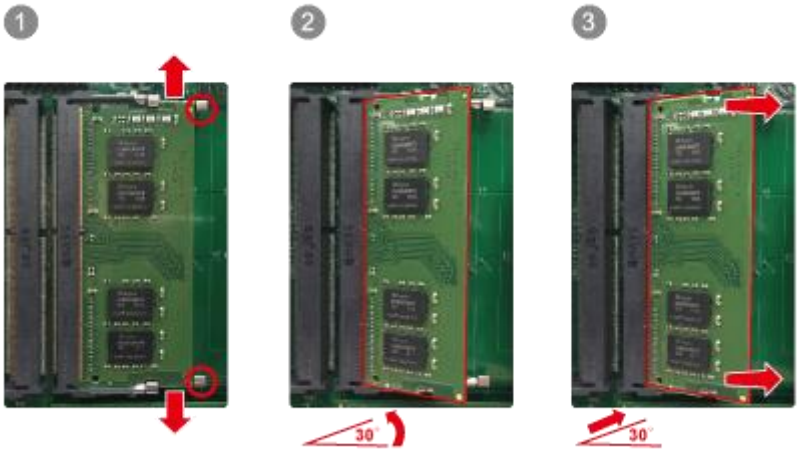
7. To verify that the memory module has been installed correctly and is being recognized by the operating system, log into QTS as administrator.
   - For QTS 4.3.0 and above: Go to "Control Panel" > "System"> "System Status">"Hardware Information" and check for Total memory.
   - For QTS 4.2.x and below: Go to "Control Panel" > "System Settings"> "System Status">"Hardware Information" and check for Total memory.

5.5 TVS-473, TVS-673, TVS-873

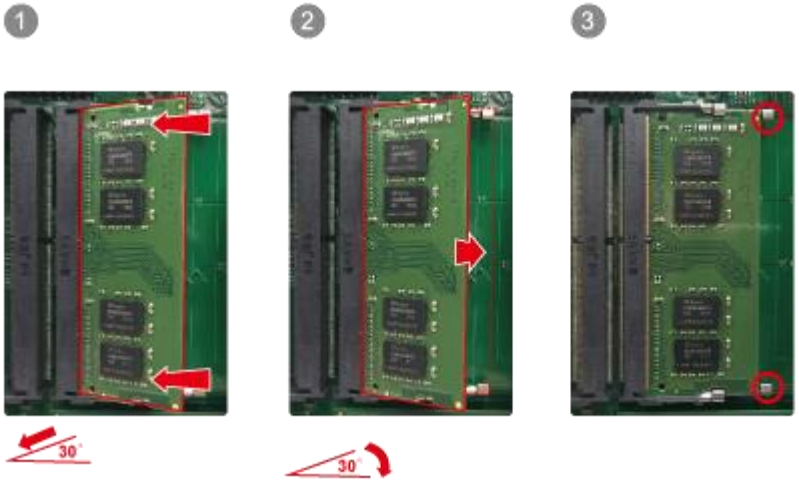
1. Loosen the screws on the back of the NAS that are connecting the case cover to the case.

2. Gently remove case cover from case.

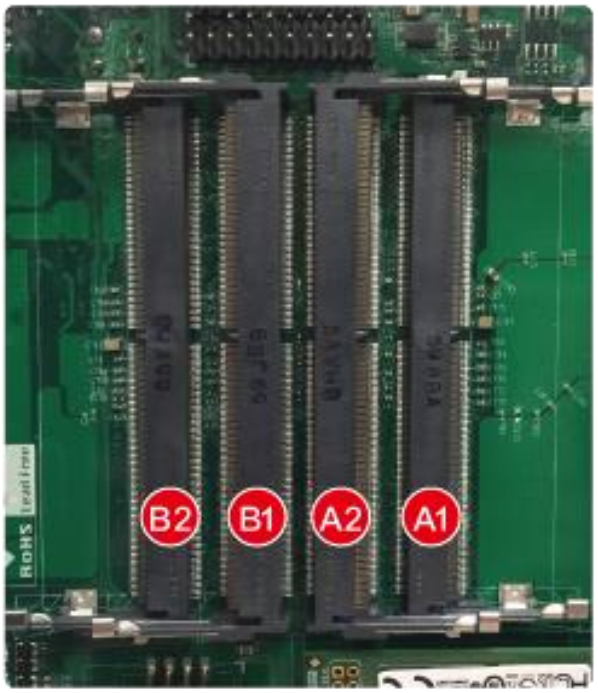
3. To remove installed memory modules, gently pull the retention clips outwards on each side so that the module tilts up at a 30-degree angle for easy removal. Remove module.



4. Hold the memory module by grasping its edges. Align the notch on the RAM module with the ridge in the memory socket. Slide the memory module into the socket at a 30-degree angle. Ensure that the module is firmly inserted into the socket and that the retention clamps are secure.



Note: The maximum supported memory is 64GB.
For one SODIMM module, insert memory into slot A2 or B2.
For two SODIMM modules using dual channel, insert memory into A1 and A2, B1 and B2, or A2 and B2.
For three SODIMM modules, insert memory into A1 and A2 and B2 or B1 and B2 and A2.



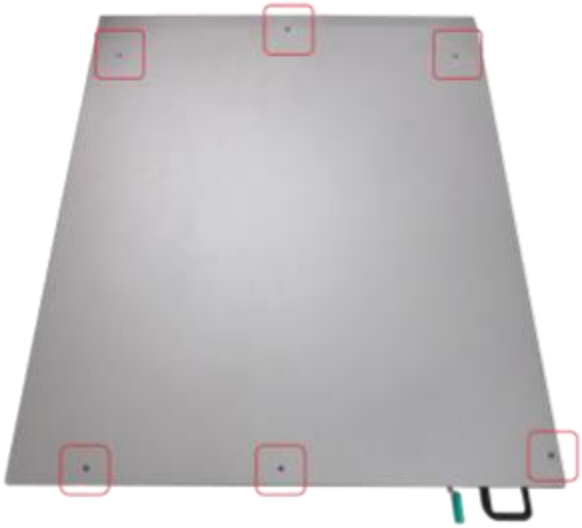
5. Gently push the memory module towards the motherboard until the retention clips lock the memory module in place.

6. Close the case cover and fasten the screws. Connect the power adaptor and cables to the NAS. Power on NAS.

7. To verify that the memory module has been installed correctly and is being recognized by the operating system, log into QTS as administrator and go to "Control Panel" > "System" > "System Status" > "Hardware Information" and check for Total memory.

5.6 TS-431U, TS-451U, TS-x53U, TS-x63Useries (4/8/12-bay)

1. Open the NAS.
   a. TS-431U, TS-451U, TS-453U, TS-463U series: Loosen all the screws on the top of the NAS.



b. TS-853U, TS-863U, TS-1253U, TS-1263U series: Loosen the two screws on the rear of the NAS.

2. Open the NAS. Pull the retention clips on each side so that the module tilts up for easy removal. Remove installed memory modules.

3. Slide the memory module to the slot at a 45-degree angle (approximately).

4. Press the memory module down. Make sure the memory module sits in properly with the clips in place.

Note: For TS-x53U & TS-451U models, always ensure that a memory module is installed in the primary slot (red box in the below figure,) or the system will fail to start. The maximum supported memory is 8GB combined.

5. Close the NAS cover and fasten the screws. Connect the power adaptor and cables back to the NAS.

5.7 TS-251+, TS-251, TS-451+, TS-451, TS-251A, TS-451A

1. Remove the screws on the rear (top and bottom) of the NAS. If you have a 2-bay NAS,

it will have **two** screws. A 4-bay NAS will **have** four.

2. Gently remove the case cover of the NAS by sliding it apart (see the underside of the NAS for visual indicators of the NAS case being locked/unlocked)

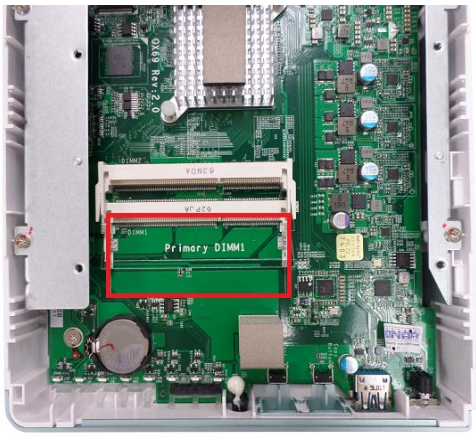
3. Remove the four inner screws (two on each side) of the hard drive cage.

4. If it is a 4-bay NAS, you will also need to remove two screws on the top of the hard drive cage.

5. Gently remove the hard drive cage from the NAS by lifting it out of its slot.

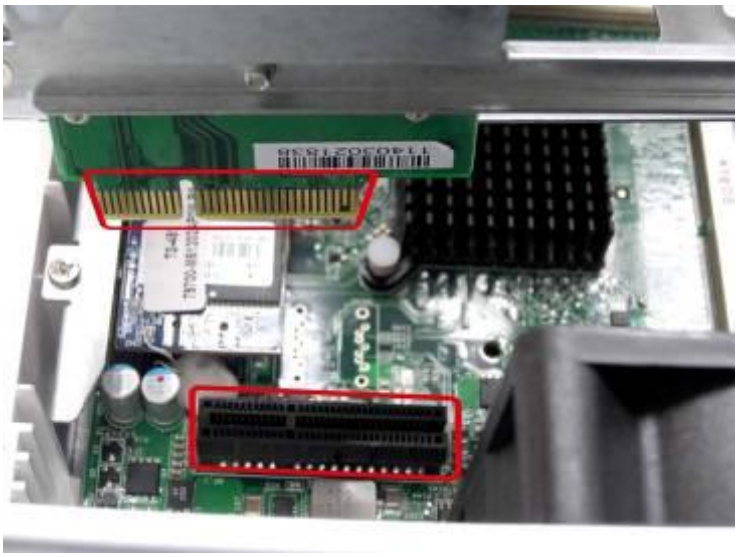
6. **Always ensure that a memory module is installed in the Primary slot (red). If not, then the system will fail to start.** When installing two memory modules, please ensure that they are the same size and ideally use the same type of RAM for both memory slots. The maximum supported memory is 8GB combined.

TS-251/TS-451



TS-251A/TS-451A

7. Reattach the hard drive cage to the NAS. Please ensure that it correctly plugs into the slot.



8. Secure the hard drive cage by fastening the four inner screws (for the 4-bay NAS, please fasten the two additional top screws.) Then reattach the case cover of the NAS by gently sliding it back together.

9. Fasten the two/four screws onto the rear of the NAS.

10. Reinsert your hard drives to the NAS.

11. Connect the power adaptor and cables back to the NAS.

12. To check that the memory module is recognized by the NAS, power up the NAS and login the web interface as an administrator. Go to "System Status">"System Information" and check the total memory in "Hardware Information".

5.8 IS-453S

1. Loosen the four screws on the bottom and the two screws on the rear panel of the NAS with a Phillips screwdriver and lift the bottom off.

2. Pull the retention clips on each side so that the module tilts up for easy removal. Remove installed memory modules.

Note: Always ensure that a memory module is installed in the primary slot that is on the top (marked with "DIMM1".) If not, then the system will fail to start. The maximum supported memory is 8GB combined.

3. Slide the memory module to the slot at a 45-degree angle (approximately) and press the memory module down until it clips into place. Ensure the memory module sits

properly with the clips in place.

4. Close the NAS bottom cover and fasten the screws (refer to Step 1 for screw positions.) Reconnect the power and network cables to the NAS.

Chapter 6. Network Expansion Card Installation

Warning:

- The following instructions should only be performed by an authorized and trained technician.
- Strictly adhere to the instructions to install a network expansion card on the NAS. Failure to do so could result in injury to human body or death.

Some NAS models provide expansion slots for network expansion. Insert an extra network expansion card (optional purchase) to the motherboard of the NAS to increase the network bandwidth. Please refer to the compatibility list at: http://qnap.com/compatibility

Note: Wake-on-LAN (WoL) is not supported by network expansion cards.

6.1 TVS-463, TS-531P, TS-531X, TVS-663, TS-831X, TVS-863, TS-563, TS-879 Pro, TS-1079 Pro, TS-463U, TS-463U-RP

Please refer the compatibility table below and replace a proper bracket for the network expansion card.

		
Bracket A	Bracket B	Bracket C

	Network Expansion Card Compatibility
Bracket A (X520-T2)	Intel® Ethernet Server Adapter X520-T2(E10G42B)
Bracket B (X520-SR2/X520-DA2)	1. Intel® Ethernet Server Adapter X520-SR2(E10G42BFSR) 2. Intel® Ethernet Server Adapter X520-DA2(E10G42BTDA)
Bracket C (Emulex)	1. Emulex OneConnect 10GbE Network Adapters, SFP+ Direct attach copper (OCe11102-NX, OCe14102-NX) 2. Emulex OneConnect 10GbE Network Adapters, Short reach optical (OCe11102-NM) 3. Emulex OneConnect 10GbE Network Adapters, SFP+ Direct attach copper (OCe11102-IX) 4. Emulex OneConnect 10GbE Network Adapters, Short reach optical (OCe11102-IM)

1. Turn off the NAS. Disconnect the power adaptor, network cable(s), and any other connectors or cables from the NAS.

2. Before installing the network expansion card, put on an antistatic wrist strap to prevent electrostatic discharge. The crocodile clip should be connected to the ground.

3. Loosen the screws on the rear of the NAS.

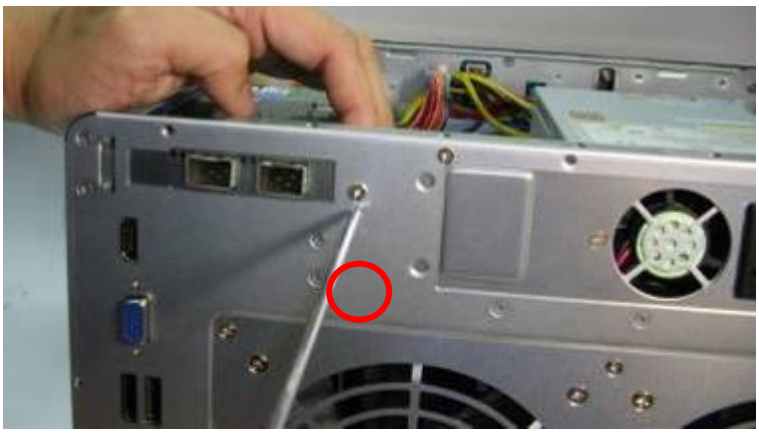
4. Remove the case cover of the NAS gently.

For TVS-463 only: Unscrew and remove the power supply unit.

5. Loosen the screws and remove the expansion slot cover.

6. Grasp the edge of the network expansion card. Align the notch on the gold edge of the card with the notch in the PCIe slot. Insert the network expansion card to the PCIe slot until it cannot go any further.

7. Fasten the screws.



8. Close the case cover and fasten the screws. Connect the power adaptor and cables to the NAS.

9. To check that the network expansion is recognized by the NAS, power up the NAS and login the web interface as an administrator. Go to "System Administration">"Network">"TCP/IP" and check the total number of network interfaces.

6.2 TS-1635

The TS-1635 provides a PCIe 2.0x2 expansion slot so that users may choose to install a network expansion card for added network performance.

To do so, follow the below steps:

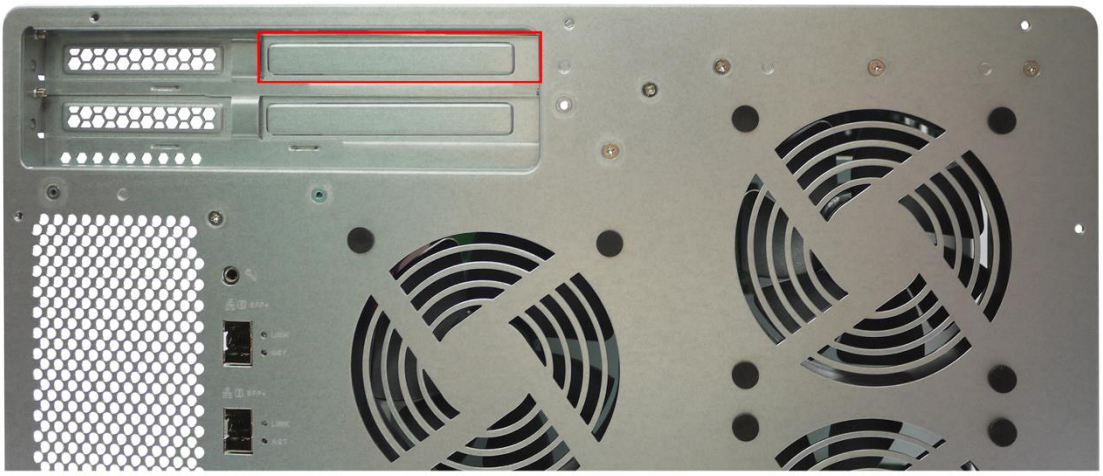
1. Turn off the NAS. Disconnect power cord(s), network cable(s), and any other cables attached to the device.

2. Before opening the NAS, wear an antistatic wrist strap and connect the crocodile clamp to ground to prevent electrostatic discharge from damaging equipment.

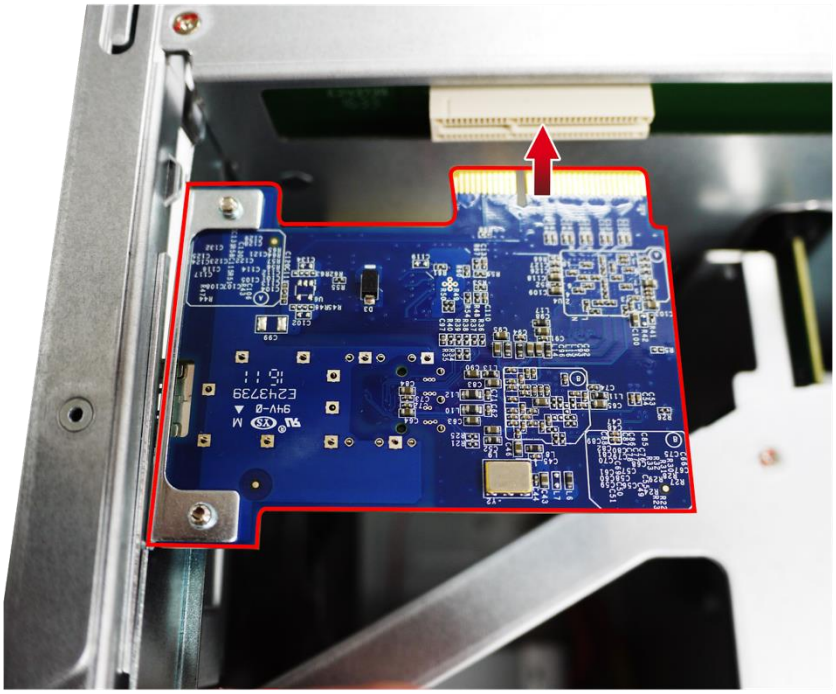
3. Loosen the screws on the back of the NAS that are connecting the case cover to the case.

4. Gently remove case cover from case.

5. Loosen the screw of the top full-sized PCIe bracket. Remove bracket.



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



7. Fasten screw to lock in card.

8. Close the case cover and fasten the screws. Connect the power adaptor and cables to the NAS.

9. To verify that the network expansion card has been installed correctly and is being

recognized by the operating system, log into QTS as administrator and go to "Control Panel" > "System Settings" > "System Status" > "Network Status" and check for total number of network interfaces.

6.3 TVS-473, TVS-673, TVS-873

Note:

1. TVS-473 uses low-profile PCIe bracket.
3. TVS-673 and TVS-873 use full height PCIe bracket.

1. Turn off the NAS. Disconnect power cord(s), network cable(s), and any other cables attached to the device.

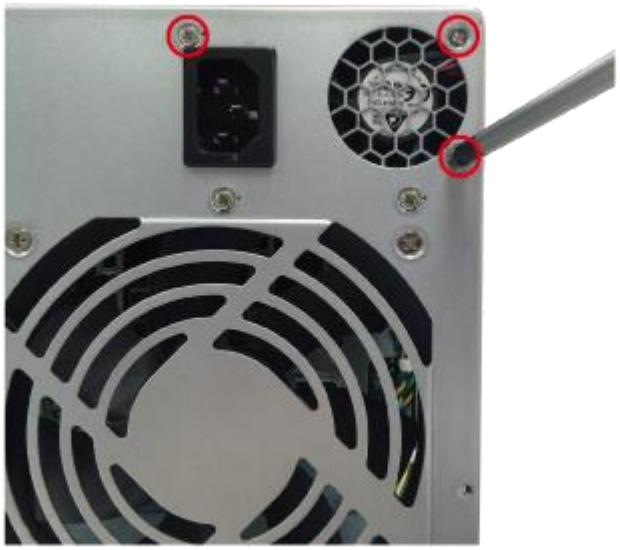
2. Before opening the NAS, wear an antistatic wrist strap and connect the crocodile clamp to ground to prevent electrostatic discharge from damaging equipment.

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. Loosen and remove the screws on the back of the NAS that are connecting the case cover to the case.

5. Gently remove case cover from case.

6. Loosen and remove the 3 screws on the back of the PSU.

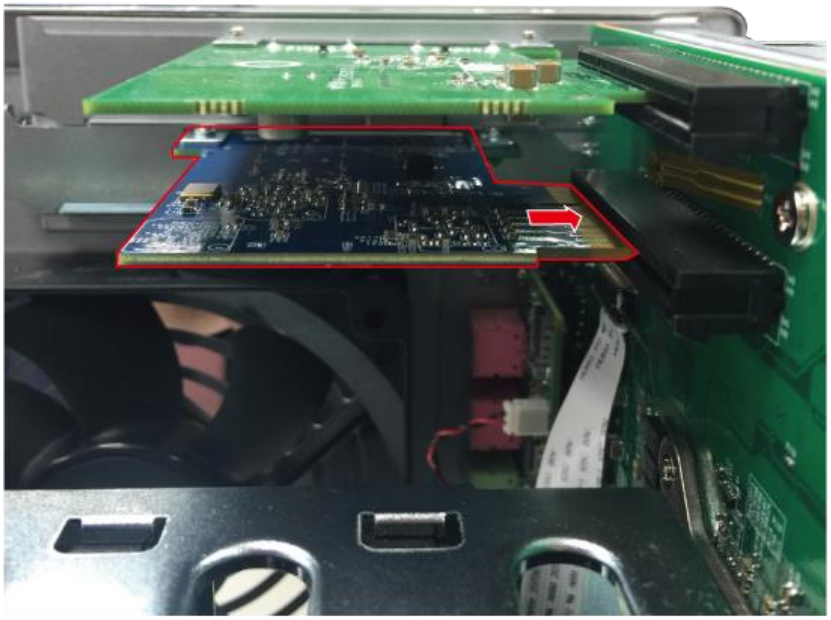


7. Loosen and remove the remaining 2 screws connecting the PSU to the case.

8. Position the PSU so that a screw driver can access the screw of the PCIe bracket.

9. Loosen and remove the screw of the PCIe bracket. Remove bracket.

10. 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.



11. Fasten screw to lock in card.

12. Place PSU back to its original position and fasten the 5 screws that were removed in steps 6 and 7.

13. Close the case cover and fasten the screws. Connect the power adaptor and cables to the NAS.

14. To verify that the network expansion card has been installed correctly and is being recognized by the operating system, log into QTS as administrator and go to "Control Panel" > "System Settings" > "System Status" > "Network Status" and check for the total number of network interfaces.

6.4 TS-463U, TS-463U-RP, TVS-471U

1. Turn off the NAS. Disconnect the power adaptor, network cable(s), and any other connectors or cables from the NAS.

2. Before installing the network expansion card, put on an antistatic wrist strap to

prevent electrostatic discharge. The crocodile clip should be connected to the ground.

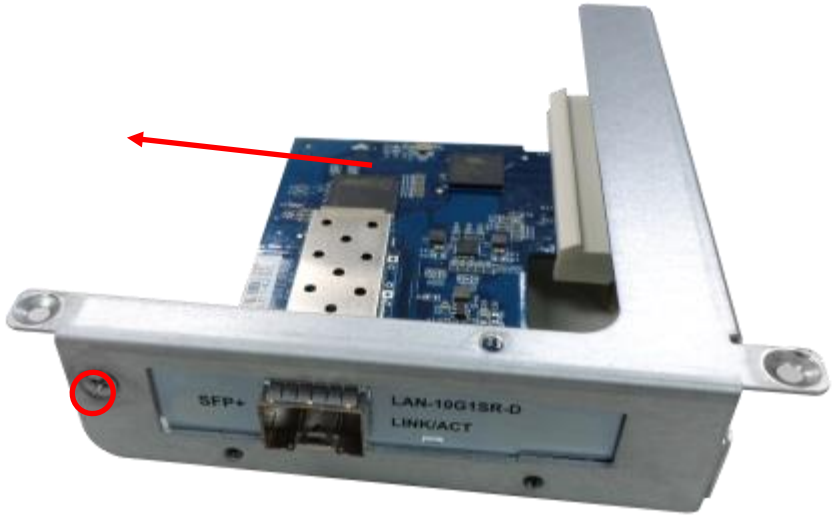
3. Loosen all the screws on the top of the NAS as shown in the illustration.

4. Remove the top cover in both hands.

5. Loosen the screws as shown in the illustration.

6. Grasp the metal edge of the riser card module. Remove the module gently.

7. Remove the network expansion card/bracket.
   a. For TS-463U and TS-463U-RP, loosen the screw and remove the network expansion card.



   b. For TVS-471U, loose the screw and remove the bracket

8. Insert the new network expansion card to the riser card module until it cannot go any further. Then fasten the screw.

9. Align the notch on the gold edge of the riser card with the notch in the PCIe slot. Insert the riser card module to the PCIe slot until it cannot go any further.

10. Fasten the screws. Close the case cover and fasten the screws.

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

12. To check that the network expansion is recognized by the NAS, power up the NAS and login the web interface as an administrator. Go to "System Administration" > "Network" > "TCP/IP" and check the total number of network interfaces.

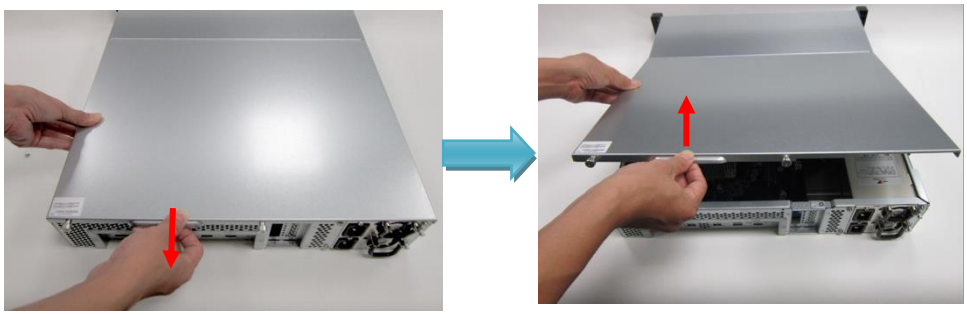
6.5 TS-863U, TS-863U-RP, TS-1263U, TS-1263U-RP

1. Turn off the NAS. Disconnect the power adaptor, network cable(s), and any other connectors or cables from the NAS.

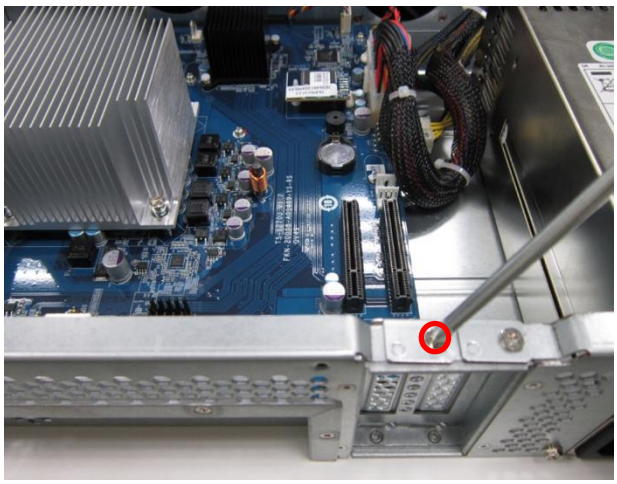
2. Before installing the network expansion card, put on an antistatic wrist strap to prevent electrostatic discharge. The crocodile clip should be connected to the ground.

3. Loosen the two screws on the rear of the NAS.

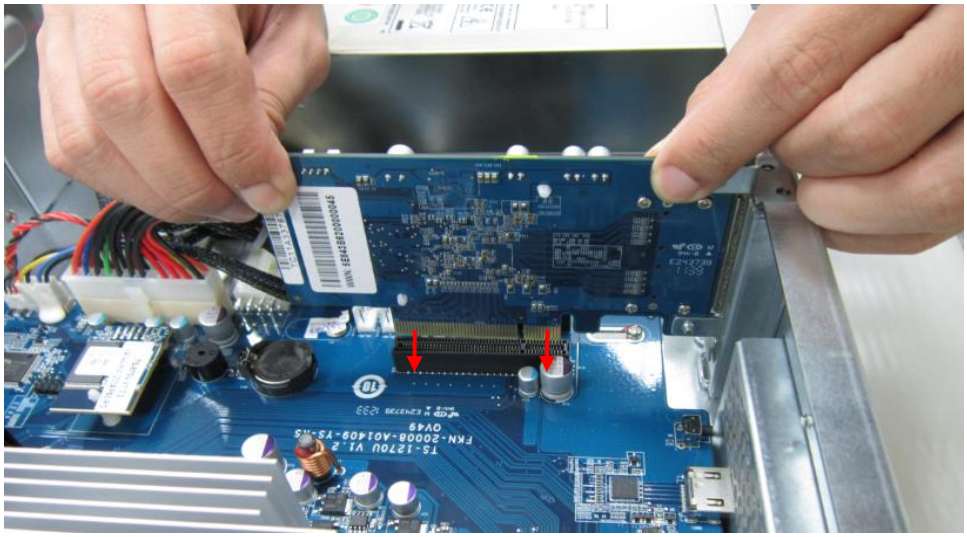
4. Hold the notch at the edge of the top cover. Remove the top cover in both hands.



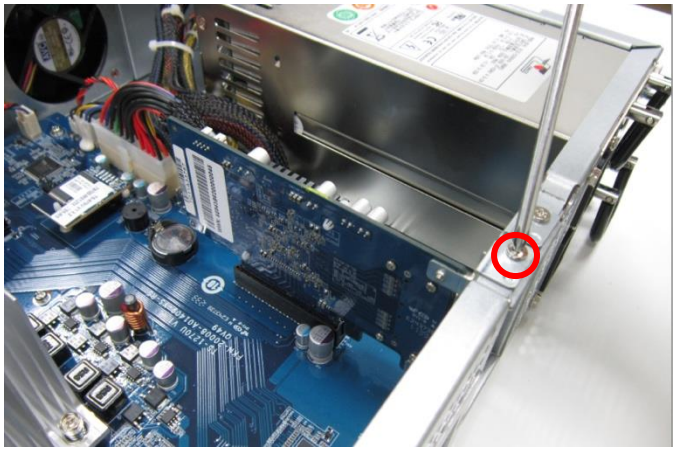
5. Loosen the screw and remove the expansion slot cover.



6. Grasp the edge of the expansion card. Align the notch on the gold edge of the card with the notch in the PCIe slot. Insert the network expansion card to the PCIe slot until it cannot go any further.



7. Fasten the screws.



8. Close the case cover and fasten the screws. Connect the power adaptor and cables to the NAS.

9. To check that the network expansion is recognized by the NAS, power up the NAS and login the web interface as an administrator. Go to “System Administration” > “Network” > “TCP/IP” and check the total number of network interfaces.

Chapter 7. Install and Hot-swap Hard Drives

Caution:

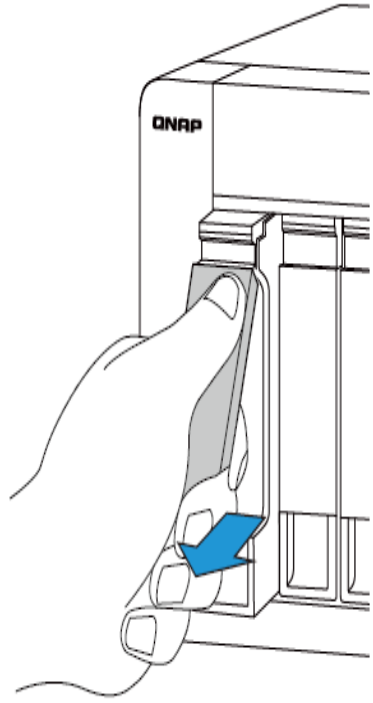
- Before starting, please ensure that you turn off the NAS, disconnect the power adaptor, network cable(s), and also remove any other device/cable that is attached to the NAS.
- Please ensure that you wear an antistatic wrist strap during the entire process to prevent electrostatic discharge. The crocodile clip should be connected to the ground.

7.1 Install Hard Drives

Follow the below steps to install hard drives on the NAS.

7.1.1. TS-x51, TS-x51A, TVS-x63, TS-563, TS-x53 Pro, TS-651, TS-831X, TS-851, TS-531X, TS-531P, TS-x53A, TS-x31P

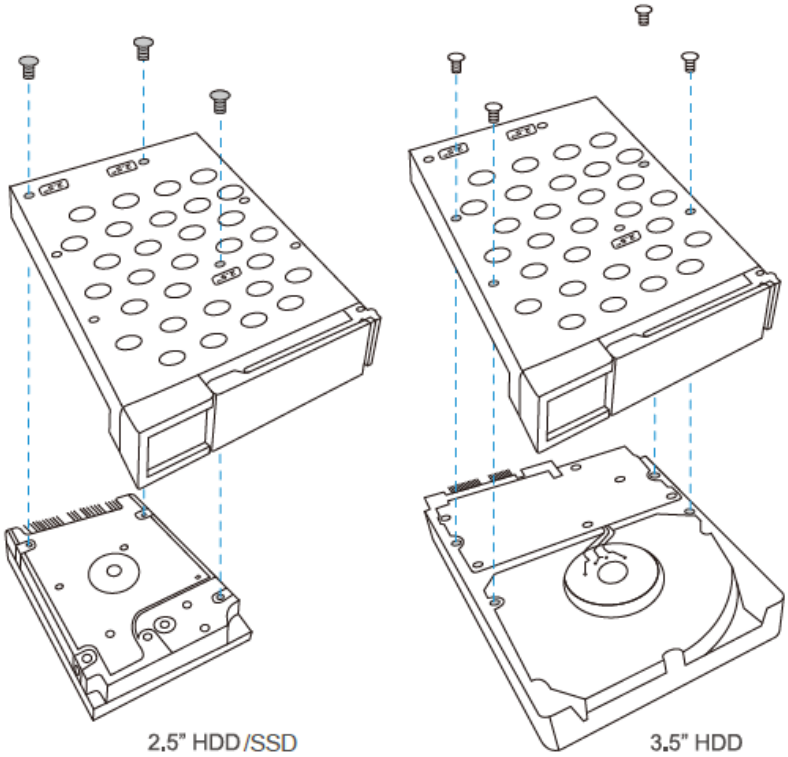
1. Lift the hard drive lever and pull the tray out.



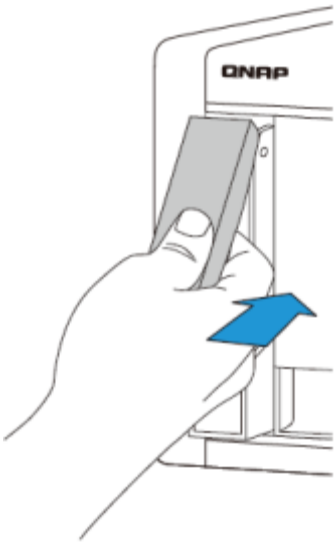
2. Install the HDDs

a. For 3.5” HDDs, secure the four screws in the back of the hard drive tray.

b. For 2.5” HDDs, follow the signs which are marked on the tray then secure the three screws in the back of the hard drive tray

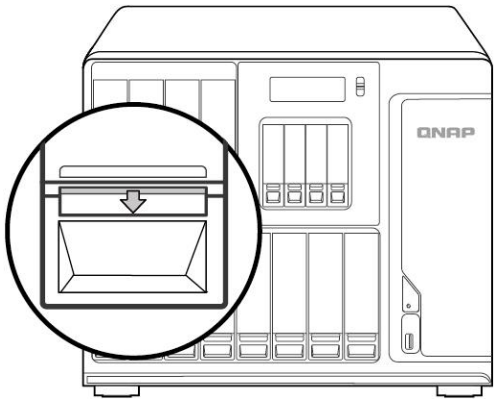


3. Insert the hard drive trays into the NAS all the way to the rear and push the lever back until you hear a click.

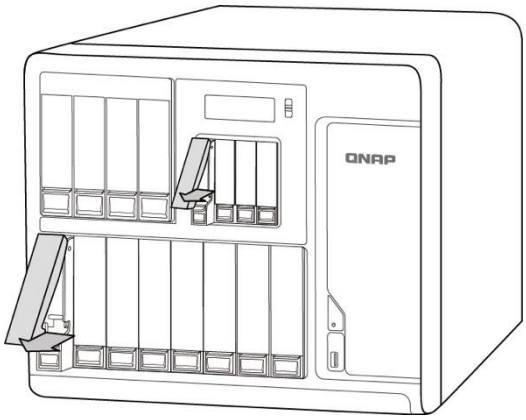


7.1.2. TS-1635

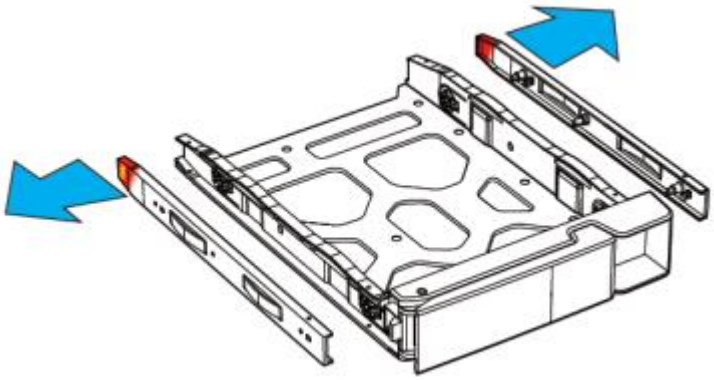
1. Remove hard drive tray from NAS:
   i. Push the blue lock switch on the tray down to the unlock position.



   ii. Push the button below the blue switch to release the lever.
   iii. Pull out tray using lever.

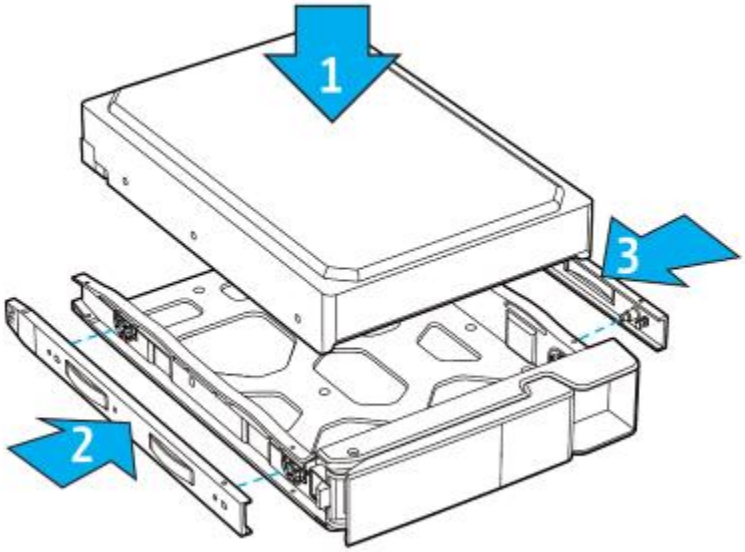


2. Install HDD/SDD onto tray.
   a. 3.5” HDD:
      i. Remove the fastening panels from the sides of the drive tray.



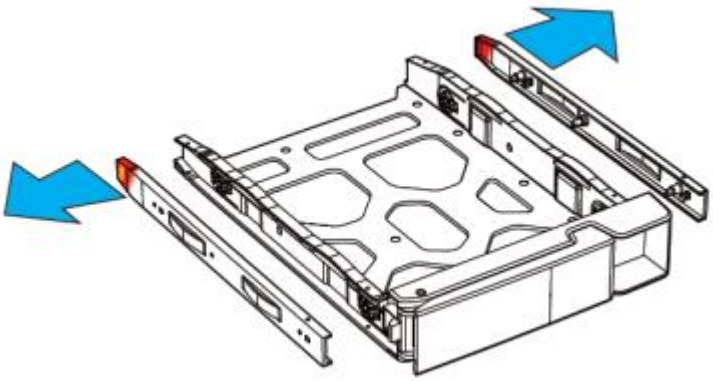
ii. Place hard drive onto tray so that the side holes of the tray are aligned with the side holes of the harddrive.

iii. Reinsert fastening panels to lock drive to tray.



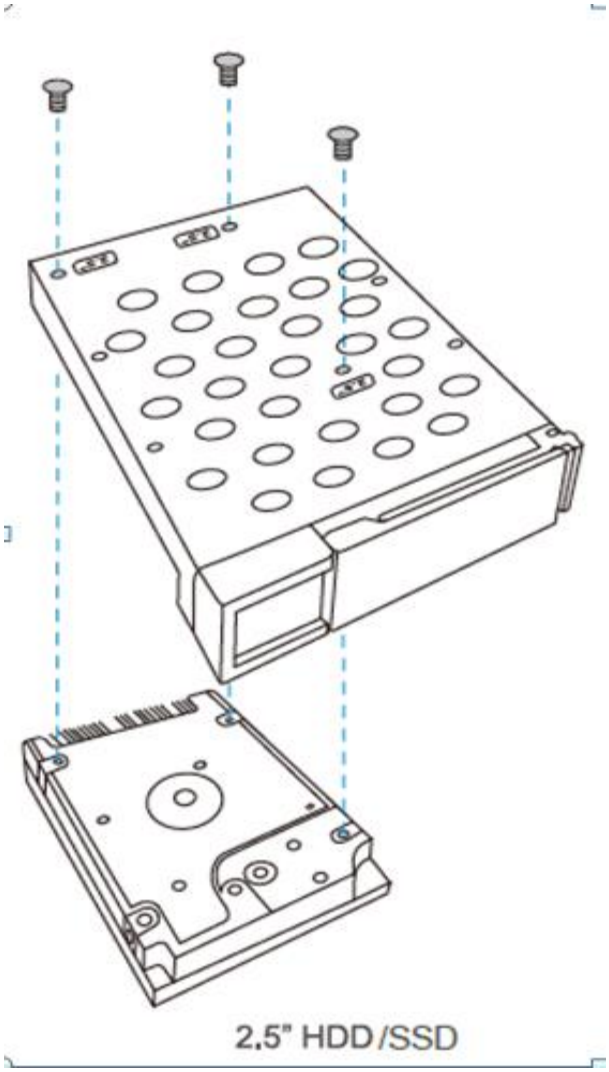
b. 2.5” HDD/SSD:

i. Remove the fastening panels from the sides of the drive tray.



ii. Place hard drive onto tray so that the bottom holes of the tray are aligned with the bottom holes of the harddrive.

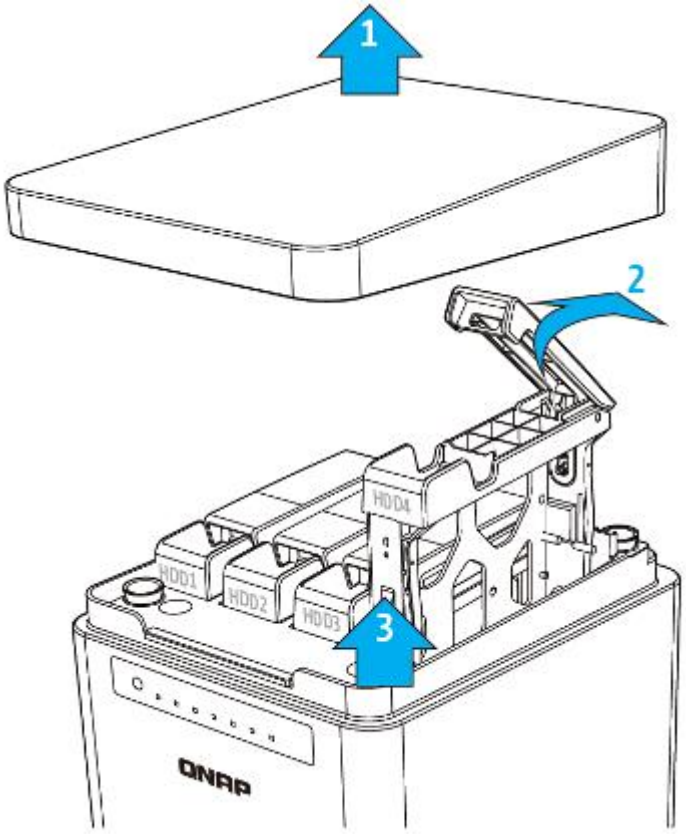
iii. Reinsert fastening panels to lock drive to tray.



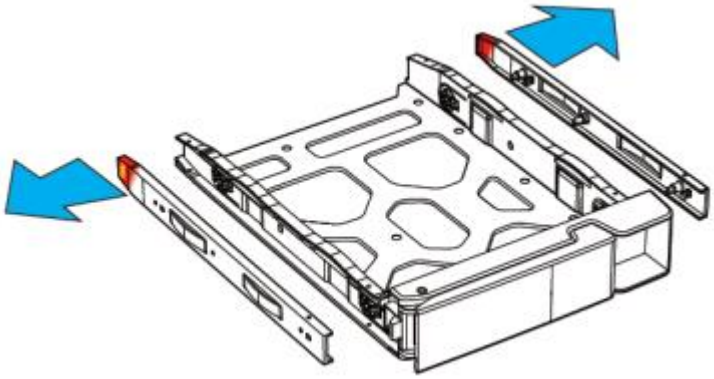
3. Load tray back into drive bay.
   i. Insert the drive tray into the NAS.Verify that the tray is correctly oriented (top of HDD facing right) and fully pushed in.
   ii. Close the latch, and lock the switch.

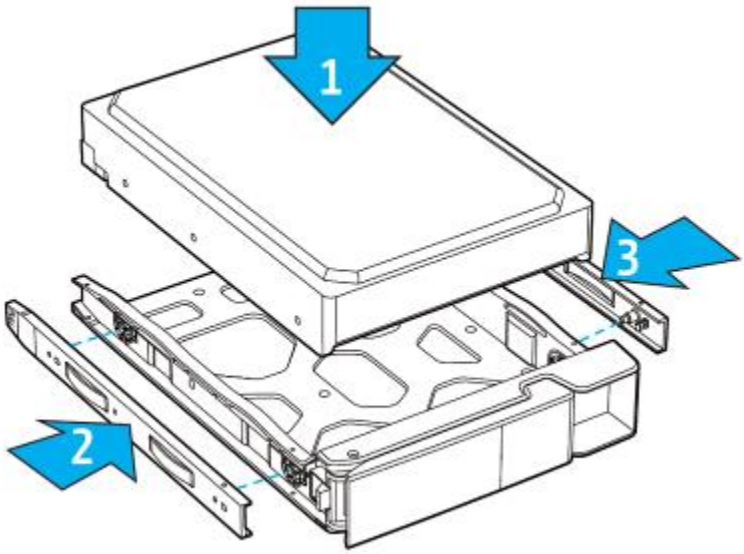
7.1.3. TS-453Bmini, TS-453Mini

1. Remove the case cover. Open and remove the hard drive tray.

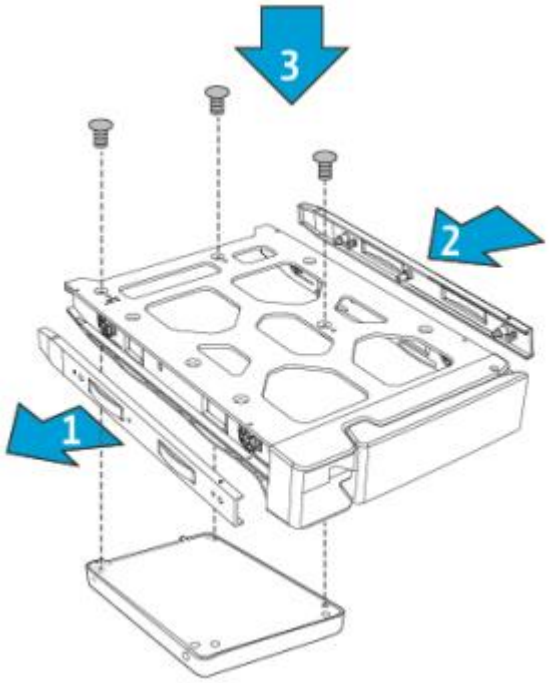


2. Install the HDD:
    a. For 3.5” HDDs, remove both brackets (pinch the end marked “pull” to pull and separate the bracket) from the tray. Place the hard drive on the tray and clip-in both brackets.

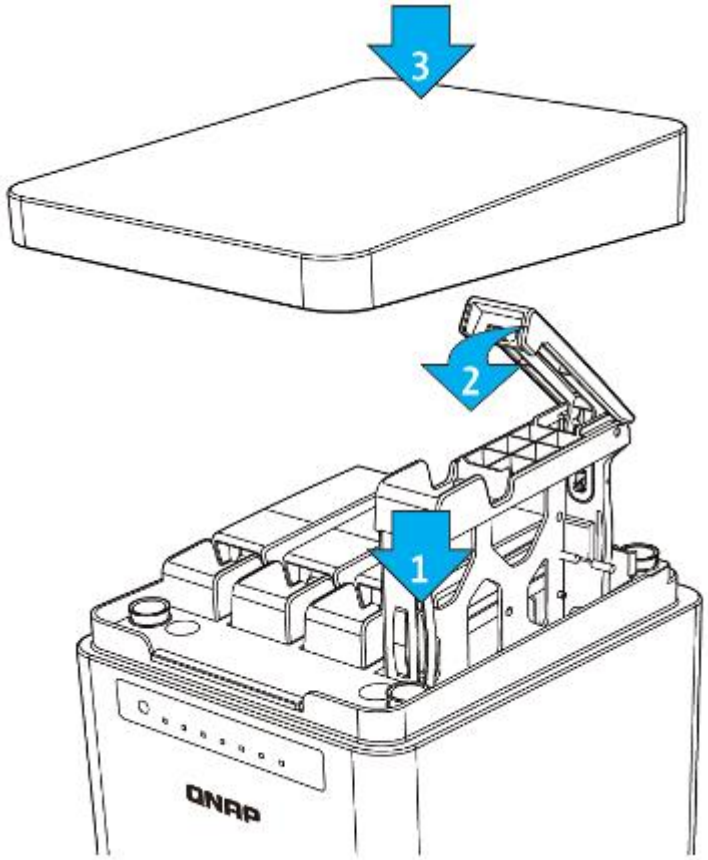




b. For 2.5” HDDs/SSDs, only remove the bracket next to the 2.5” screw holes (they are marked on the bottom of the tray.) Secure the three screws in the back of the hard drive tray.

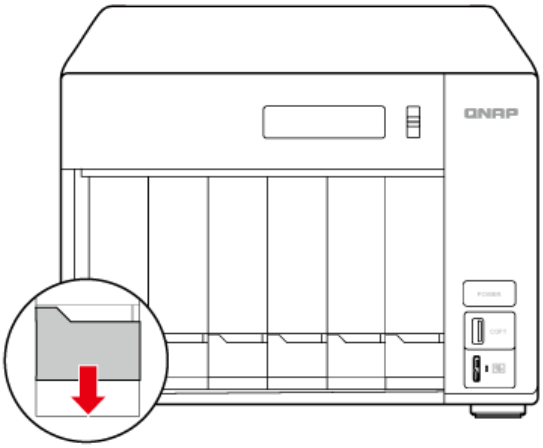


3. Insert the hard drive tray into the Turbo NAS all the way to the bottom and close the case cover.

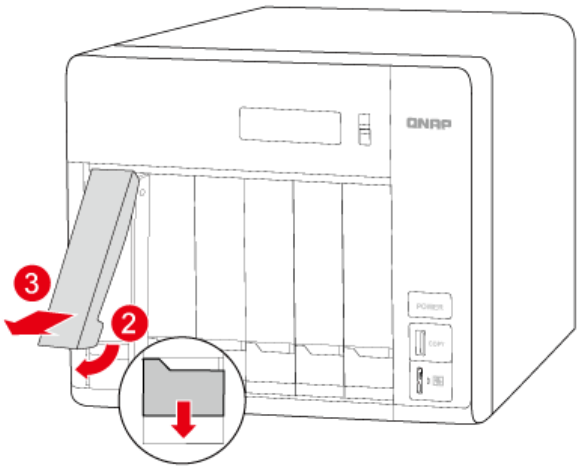


7.1.4. TVS-473, TVS-673, TVS-873

1. Remove hard drive tray from NAS:
   i. Push the lock switch on the tray down to the unlock position.

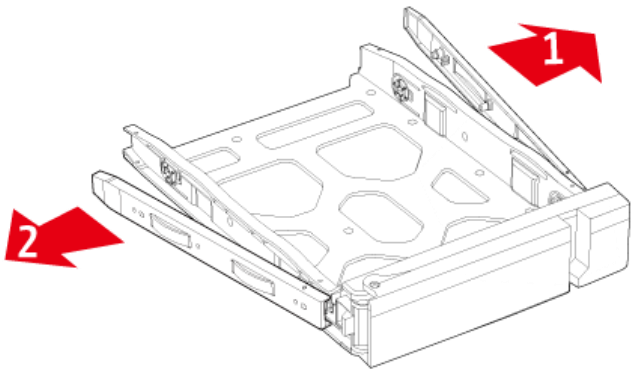


ii. Push the button below the blue switch to release the lever.

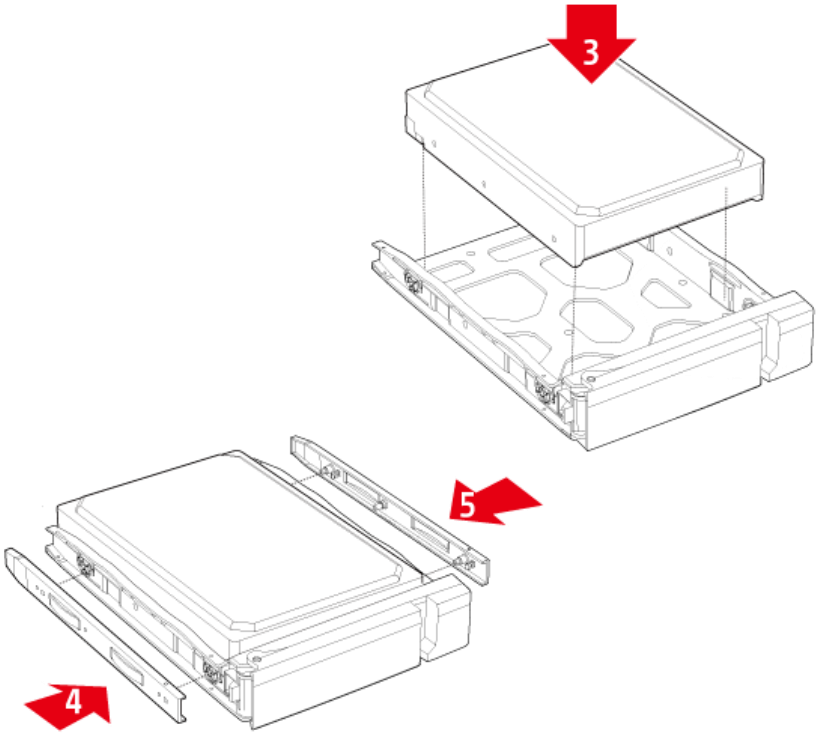


iii. Pull out tray using lever.

2. Install HDD/SDD onto tray.
   a. 3.5” HDD:
      i. Remove the fastening panels from the sides of the drive tray.



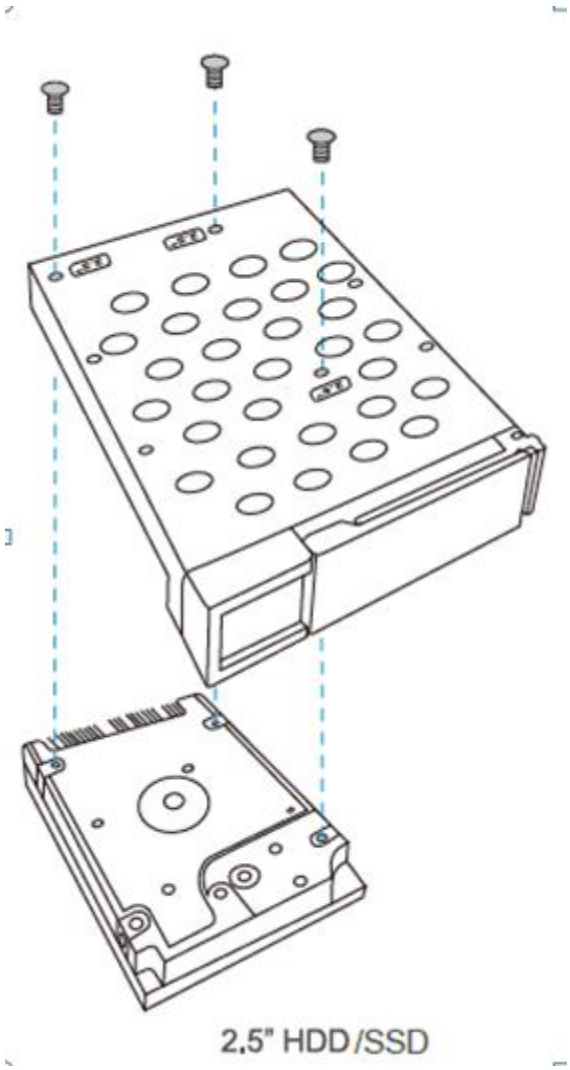
      ii. Place hard drive onto tray so that the bottom holes of the tray are aligned with the bottom holes of the harddrive.
      iii. Reinsert fastening panels to lock drive to tray.



b. 2.5” HDD/SSD:

i. Insert 2.5” drive onto tray so that HDD/SSD connector is perfectly aligned with the opening at end of the tray.

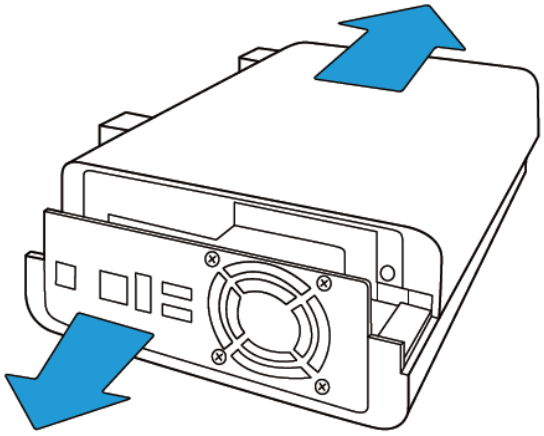
ii. Secure the three screws in the back of the hard drive tray.



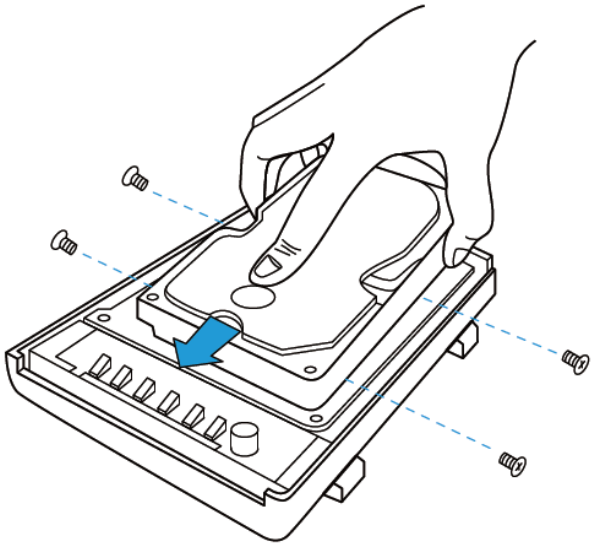
3. Load tray back into drive bay.
   i. Insert the drive tray into the NAS. Verify that the tray is correctly oriented (top of HDD facing right) and fully pushed in.
   ii. Close the latch, and lock the switch.

7.1.5. TS-112P, TS-212P and TS-251C

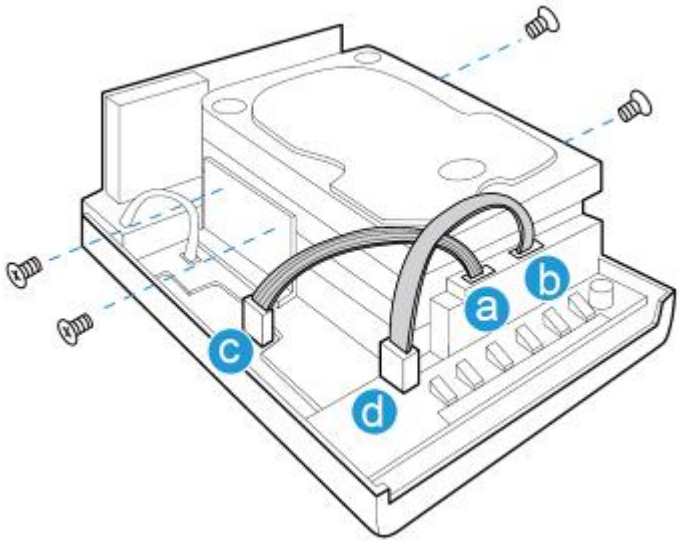
1. Loosen the screws on the rear (top and bottom) of the NAS. Remove the case cover of the NAS by sliding it apart (see the underside of the NAS for visual indicators of the NAS case being locked/unlocked.)



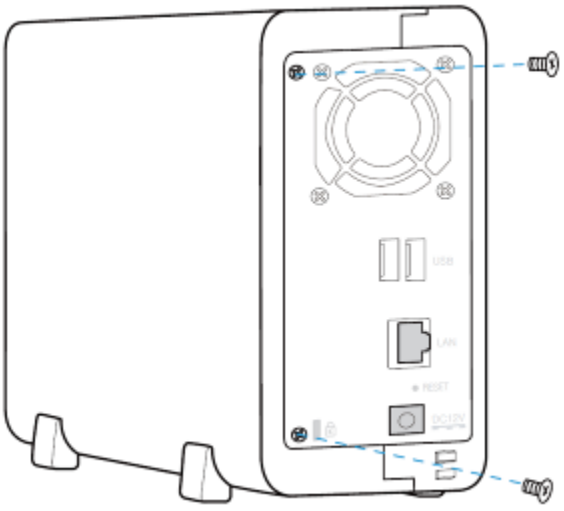
2. Install the hard drives:
   a. For TS-112P:Place the hard drive in the hard drive cradle and slide it forward to lock it into the connector. Secure the screws on the slides of the hard drive.



   b. For TS-212P and TS-251C: Place the first hard drive in the hard drive cradle and slide it forward to look it into the connector. Place the second hard drive on top of the first hard drive and secure the screws on the slides of both hard drives. Connect the SATA cable and power cable to the connectors as shown in the picture.

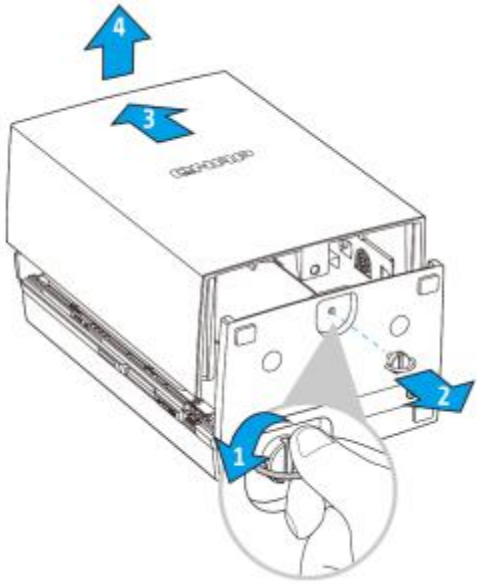


3. After installing the hard drives, cover the NAS with the case cover and fasten the round head screws. Then, place the NAS vertically on the stands.

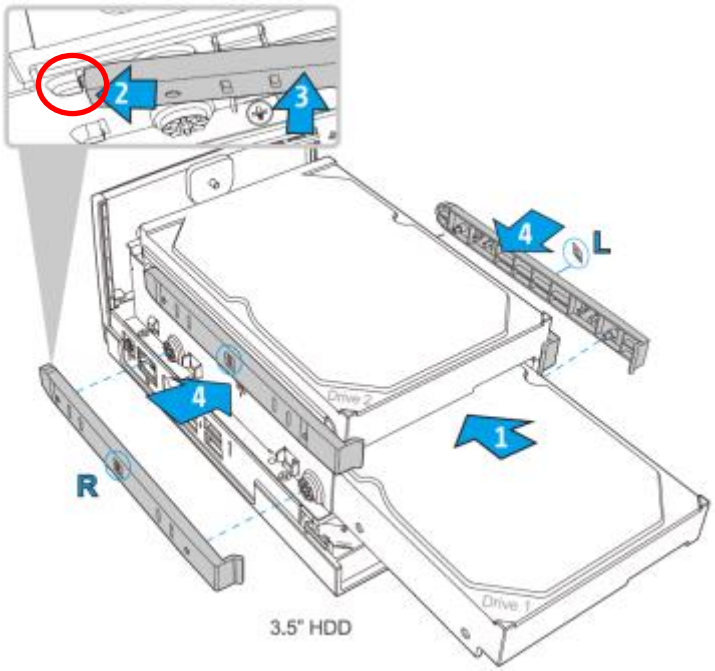


7.1.6. TAS-168, TAS-268, TS-128, TS-228

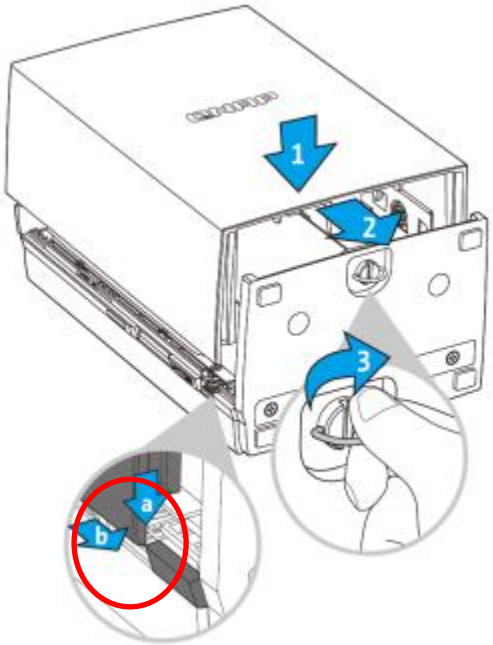
1. Remove the hand screw and the top cover.



2. Put the hard drive in the hard drive cradle and slide it forwards to lock it into the SATA connector. Clip in both brackets, slide the bracket into the hole in point 2 before pressing the bracket towards the HDD (for the TAS-268, repeat the same step for the second drive.)

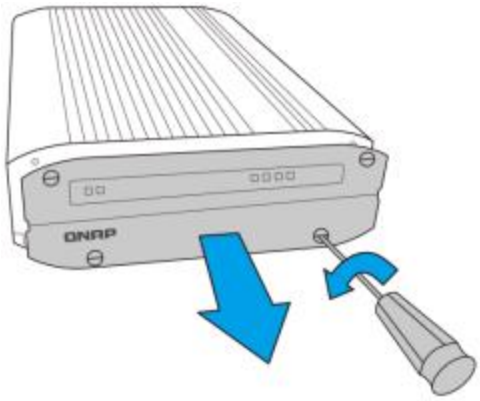


3. Align point a on the case cover with point b on the front of the NAS (see figure below). Push forward the case cover (step 2) and fasten the toolless screw to secure the case cover.

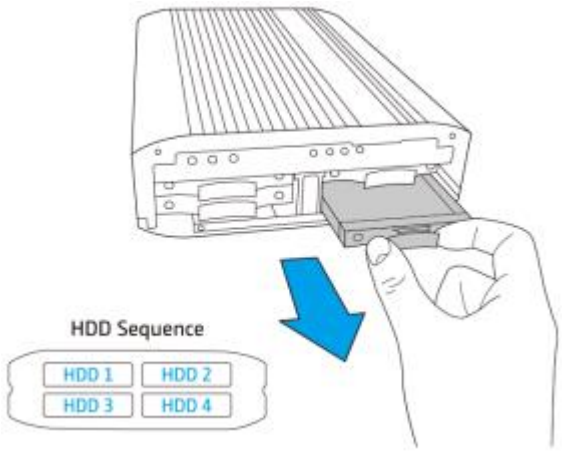

1
2
3
a
b

7.1.7. IS-453S

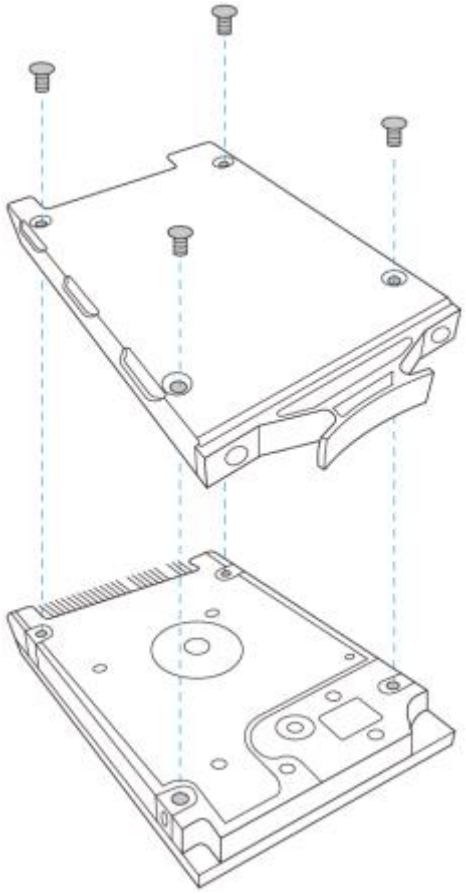
1. Remove all four screws from the front panel.



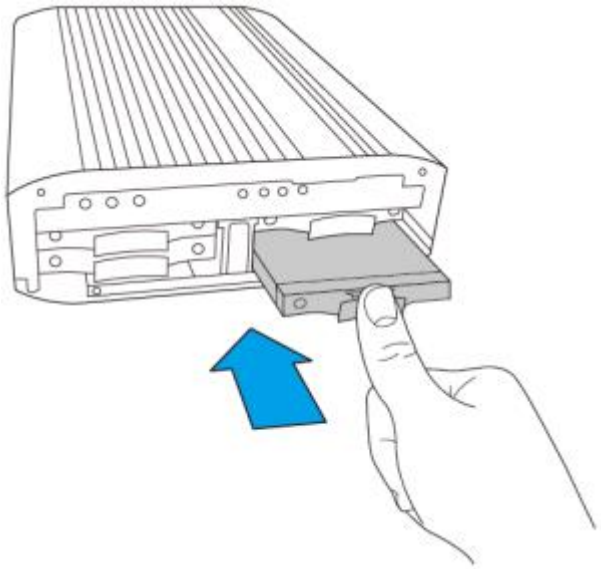
2. Remove the drive tray.



3. Attach the drive to the tray and secure the four screws in the back of the drive tray.

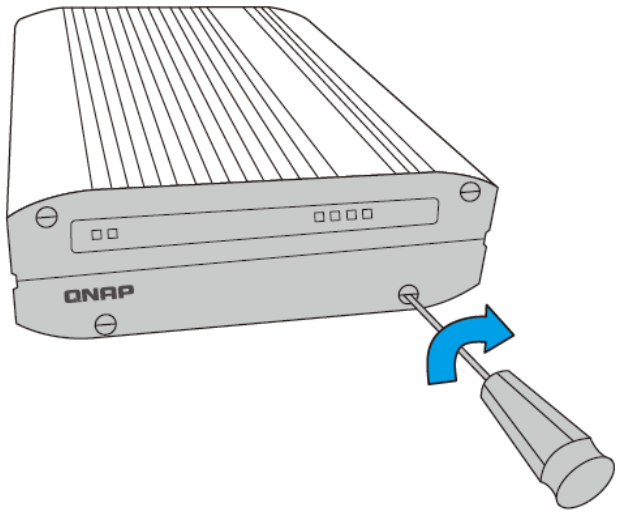


4. Insert the drive tray into the NAS all the way to the end.



5. Repeat Step 2 to 4 to install the remaining drives. Please follow the HDD Sequence shown in Step 2 to do so.

6. Close the front panel and fasten the screws.



7.2 Hot-swap Hard Drives

QNAP NAS is compatible with 2.5-inch/3.5-inch SATA hard disk drives from major hard disk brands. For the updated hard drive compatibility list, please visit http://www.qnap.com.

Caution:

- QNAP disclaims any responsibility for product damage/malfunction or data loss/recovery due to misuse or improper installation of hard disks in any occasions for any reasons.
- Note that if a hard drive (new or used) which has never been installed on the NAS before it is installed, the hard drive will be formatted and partitioned automatically and all the disk data will be cleared.

System	Supports 3.5-inch SATA Hard Drives	Supports 2.5-inch SATA Hard Drives	Supports 2.5" SATA SSD	Supports M.2 SATA SSD	Supports Hot-swap Hard Drives (RAID 1 or above only)
TS-112P, TS-212P, TS-251C	✓				
TAS-168, TAS-268, TS-128, TS-228	✓				
TVS-473, TVS-673, TVS-873	✓	✓	✓	✓ (2280 & 2260)	✓
TS-131	✓	✓	✓		
HS-210, HS-251, HS-251+, TS-231, TS-231+, TS-251, TS-251+, TS-251A, TS-431, TS-431+, TS-431U, TS-531P, TS-451, TS-451+, TS-451A, TS-651, TS-851, TS-253 Pro, TS-453 Pro, TS-563, TS-653 Pro, TS-853	✓	✓	✓		✓

System	Supports 3.5-inch SATA Hard Drives	Supports 2.5-inch SATA Hard Drives	Supports 2.5" SATA SSD	Supports M.2 SATA SSD	Supports Hot-swap Hard Drives (RAID 1 or above only)
Pro, TS-879 Pro, TS-1079 Pro, TS-879U-RP, TS-1279U-RP, TS-EC879U-RP, TS-EC1279U-RP, TS-1679U-RP, TS-EC1679U-RP, TS-451U, TS-453U, TS-453U-RP, TS-853U, TS-853U-RP, TS-1253U, TS-1253U-RP, TS-870U-RP, TS-1270U-RP, TS-470/470 Pro, TS-670/670 Pro, TS-870/870 Pro, TVS-463, TVS-663, TS-531X, TS-831X, TVS-863, TVS-863+, TS-453mini, TS-453Bmini, TS-463U, TS-463U-RP, TS-863U, TS-863U-RP, TS-1263U, TS-1263U-RP, TS-531P, TS-253A, TS-453A, TS-653A, TS-853A, TS-1635,					
TS-451S, TS-453S Pro, TS-853S Pro,		✓	✓		✓

System	Supports 3.5-inch SATA Hard Drives	Supports 2.5-inch SATA Hard Drives	Supports 2.5" SATA SSD	Supports M.2 SATA SSD	Supports Hot-swap Hard Drives (RAID 1 or above only)
IS-453S, TVS-882S, TVS-882ST					
TVS-473, TVS-673, TVS-873	✓	✓	✓	✓ (2280, 2260)	✓
TBS-453A				✓ (2280, 2260, 2242)	

The NAS supports hot-swapping the hard drives when 1 member drive crashes in RAID 1, 1–2 member drives crash in RAID 5 or RAID 6. Follow the steps below to hot-swap the hard drive when a member drive fails in a RAID configuration.

1. Login the NAS and check the disk volume configuration in "Volume Management".
2. The volume status should be "in degraded mode".
3. Prepare a new hard drive to replace the failed one. The capacity of the new hard drive should be the same as or larger than the failed hard drive.
4. Unplug the failed drive from the NAS. Wait for about 20 seconds or until the server beeps twice.
5. Remove the failed drive from the drive tray.
6. Install the new hard drive on the drive tray. Insert it to the NAS.
7. The server should beep 1.5 seconds twice.
8. Check the volume status on the web administration page. The volume should be rebuilding.

 **Warning:** Users are strongly recommended to turn OFF the server before replacing the hard drive to reduce the risk of electric shock.

Chapter 8. Install M.2 SSDs

8.1 M.2 SSD Heat Sink Installation

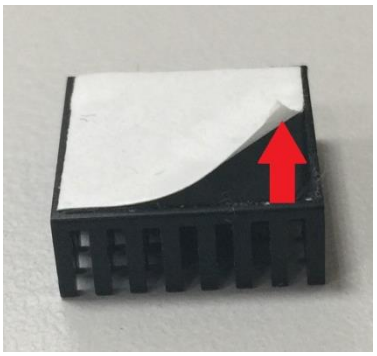
NAS models that support M.2 SSDs are packaged with M.2 SSD heat sinks. For reliable operation, it is recommended that you install the heat sinks onto the SSD controller.

To install heat sink:

1. Locate the SSD controller on the M.2 SSD. Location of SSD controller varies by model. Refer to SSD manufacturer for details.

2. Remove any existing stickers or labels on the controller.

3. Remove the release liner from bottom of the heat sink.



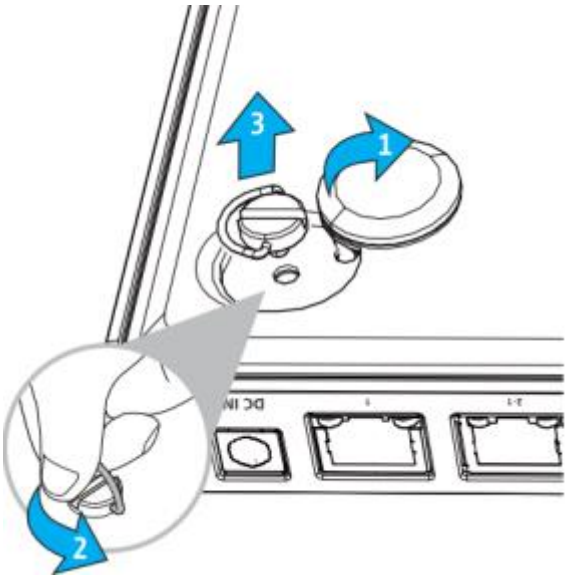
4. Stick heat sink onto the controller. No thermal paste required.

8.2 M.2 SSD Installation

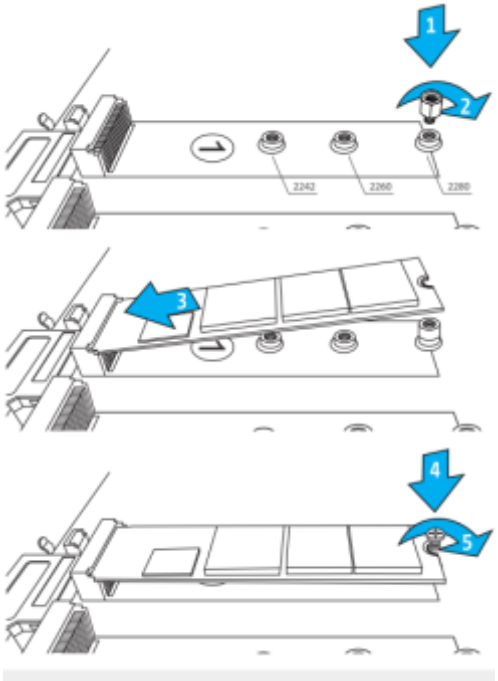
Follow the below steps to install M.2 SSD on the NAS.

8.2.1 TBS-453A

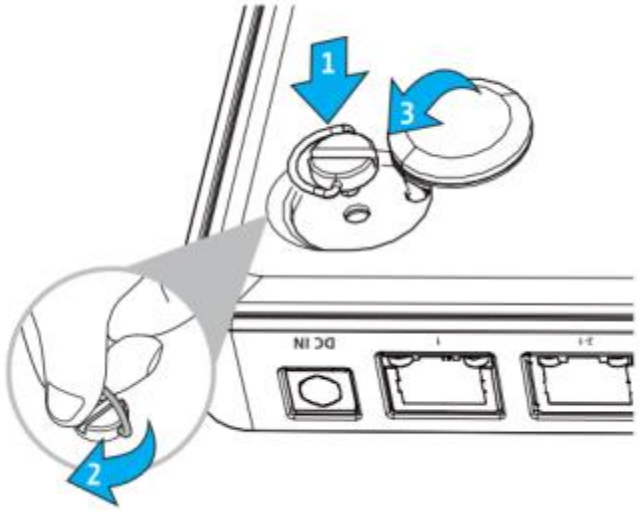
1. The system has four M.2 SSD slots that are located on the bottom of the system. The storage capacity of the system can be upgraded by adding M.2 SSD modules to vacant M.2 SSD slots or by upgrading existing M.2 SSD modules. The following procedure demonstrates how to add/replace M.2 SSD modules. To remove the bottom cover, first remove the rubber feet. Next, unscrew the four screws installed on the four corners of the bottom cover by turning them counterclockwise.



2. TBS-453A supports 3 different sizes of M.2 SSD (2242, 2260, and 2280). Move and fasten the riser screw to the appropriate location according your M.2 SSD size. Then insert the M.2 SSD to the slot and secure it in place with the supplied screws.



3. Secure the bottom cover back to the system by installing the screws of four corners (clockwise). Then put the rubber feet back as well.



8.2.2 TVS-473, TVS-673, TVS-873

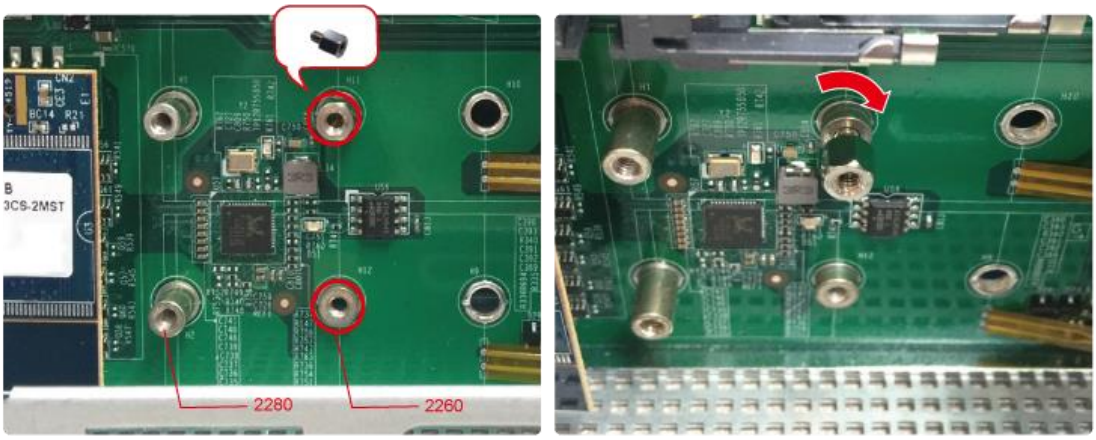
1. Turn off the NAS. Disconnect power cord(s), network cable(s), and any other cables attached to the device.

2. Before opening the NAS, wear an antistatic wrist strap and connect the crocodile clamp to ground to prevent electrostatic discharge from damaging equipment.

3. Loosen the screws on the back of the NAS that are connecting the case cover to the case.

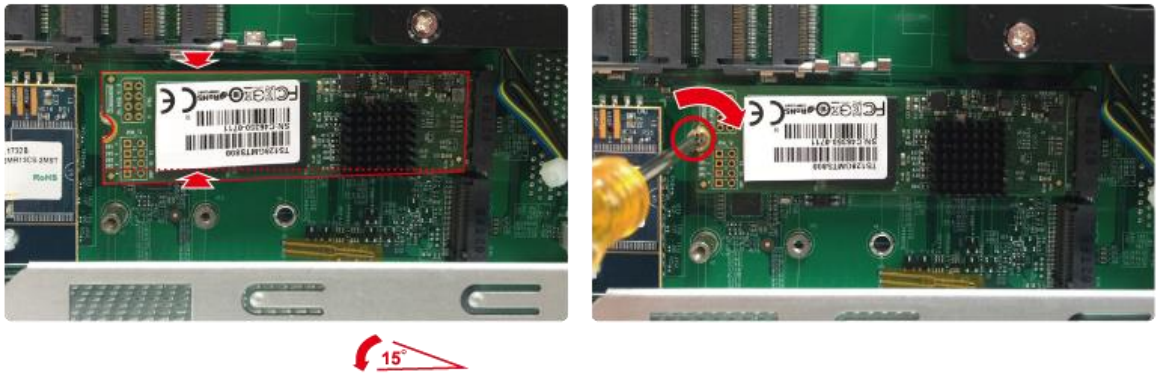
4. Remove case cover from case.

5. [Optional: for M.2 2260 SSD only] Insert and fasten riser screw.



6. Hold the M.2 SSD module by grasping its edges. Align the notch on the module with the ridge in the M.2 socket. Gently slide the memory module into the socket at a 15-degree angle. Ensure that the module is firmly inserted into slot. Do not force the M.2 drive into socket.

7. Gently lower the memory module towards the motherboard until it sits on the riser screw. While holding down the M.2 SSD in position, insert mounting screw into the riser screw, tightening as necessary to securely fasten the M.2 SSD in place. Do not over tighten the screw.



8. Close the case cover and fasten the screws. Connect the power adaptor and cables to the NAS. Power on NAS.

9. To verify that the M.2 SSD has been installed correctly and is being recognized by the operating system, log into QTS as administrator. Go to “Main Menu” > “Storage Manager”> “Disks/VJBOD”. In the “NAS Host” section, check the status of the M.2 SSD.

Chapter 9. RAID Recovery

The QNAP NAS supports RAID recovery when a healthy drive is unexpectedly removed from a RAID or JBOD configuration. Even if a healthy drive is removed from a degraded RAID 1/5/6 configuration while attempting to hot-swap a faulty drive, the user can reinsert the drive back into its original position to recover the RAID. RAID recovery is also supported when a healthy drive is unexpectedly removed from a RAID 0/JBOD configuration. 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 a "Not active" status:

1. Re-insert all hard 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 "Control Panel" > "Storage Manager" > "Storage Space".

3. Double click on the affected Storage Pool to open the Storage Pool Management window.

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

The process will take approximately 60 seconds 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 & hard drive replacement).	RAID crash.
2 hard 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 & hard drive replacement).	RAID crash.
3 hard drives fail	RAID crash.	RAID crash.

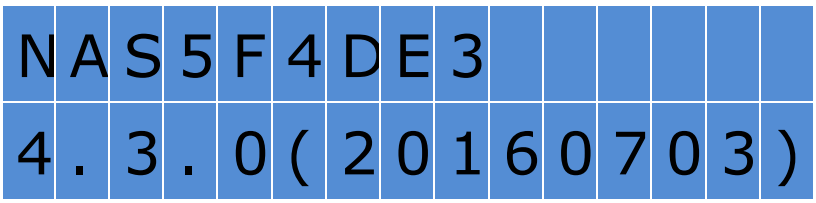
Chapter 10. Use the LCD Panel

This feature is only available for NAS models with LCD panels.

LCD Panel – QTS 4.3.0 and above

You can use the LCD panel to configure system settings and view system information. You can use the "ENTER" and "SELECT" buttons next to the panel to navigate through the LCD menu.

After starting the NAS, you can see its name and firmware version appear on the panel.



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

Viewing system IP address

1. Press "ENTER" or "SELECT" to turn on the panel.
2. Press "SELECT" to browse the NAS model name and the available IP addresses (for each network and thunderbolt interface).

This feature is particularly useful when the NAS is near you.

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

Press "SELECT" to go to the next option and "ENTER" to select an option.

TCP/IP

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

1. LAN IP Address

380

2. LAN Subnet Mask
3. LAN Gateway
4. LAN PRI. DNS
5. LAN SEC. DNS

(You can configure the above settings for every interface).

6. Enter Network Settings
    a. Network Settings – DHCP
        i. Set up DHCP on LAN1 and LAN2
    b. Network Settings – Static IP*
        i. Press "SELECT" to switch to the next available option.
        ii. Press "ENTER" to configure the selected option. The first digit will begin to blink.
        iii. Press "SELECT" to increment the selected digit, press "ENTER" to confirm the value, and go to the next digit until all digits are set.
        iv. Repeat this procedure this for every setting you want to change.
    c. Network Settings – BACK
7. Back to Main Menu

*** In this section, you can only configure IP address, subnet mask, gateway, and DNS of LAN1 and LAN2.**

Physical disk

In Physical disk, you can see the following options:

1. Disk Info
2. Back to Main Menu

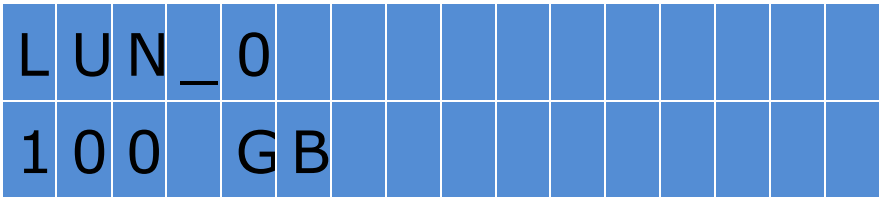
Disk Info shows the temperature and the capacity of the hard drives.

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

Volume

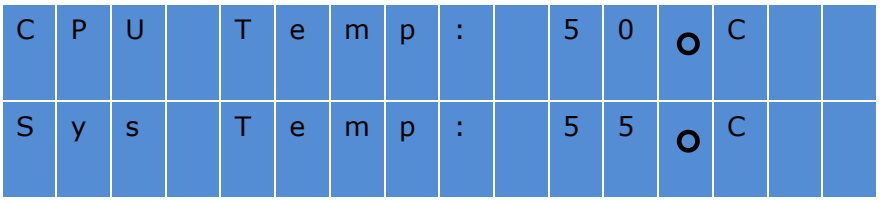
This section shows the capacities of volumes and LUNs. You can view the name and capacity of a volume/LUN. If there are multiple volumes/LUNs, press "Select" to view the information of a specific volume/LUN.

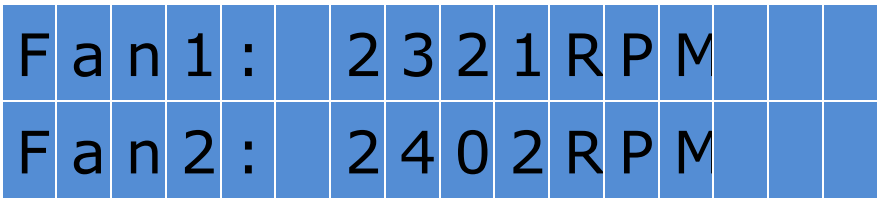
D	a	t	a	V	o	l	1								



System

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





Shut down

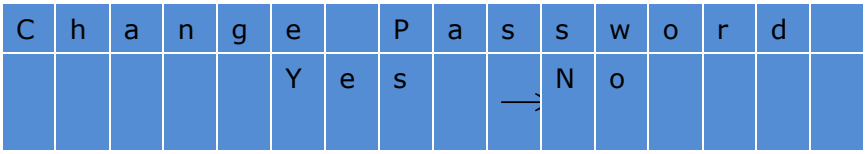
You can use this option to turn off the NAS. Press "SELECT", select "Yes", and then press "ENTER" to confirm.

Reboot

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

Password

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

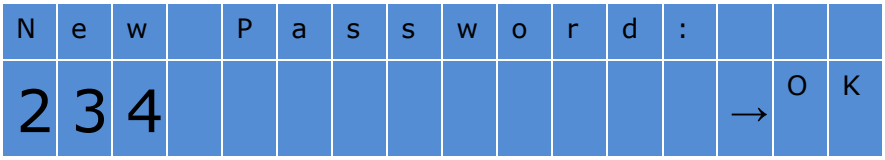


You can enter up to 8 digits for your password.

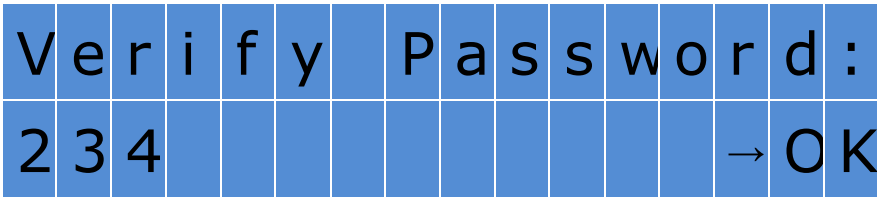
Press “SELECT” to increment the digit and press “ENTER” to add a new digit.

After inputting your desired password, press “ENTER”.

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



Verify the password to confirm the changes.

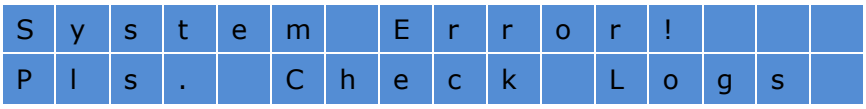


Back

Select this option to return to the Main Menu.

System Messages

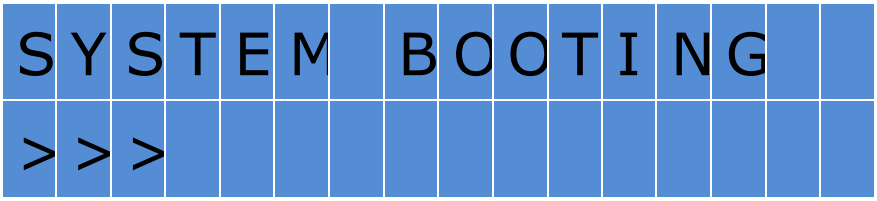
When an error occurs, a message will appear on the LCD panel. Press “ENTER” to view the message and press “ENTER” again to go to the next message.



System Message	Description
Sys. Fan Failed	The system fan has failed.
Sys. Overheat	The system has overheated.
HDD Overheat	A hard drive has overheated.
CPU Overheat	The CPU has overheated.
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	A hard drive has failed.
Vol1 Full	The disk volume (1) is full.
NAS HDD Ejected	A hard drive has been ejected from the NAS.

RX#3 HDD Ejected	A hard 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 disk volume (1) is in degraded mode.
Vol1 Unmounted	The disk volume (1) is unmounted.
Vol1 Nonactivate	The disk volume (1) is inactive.

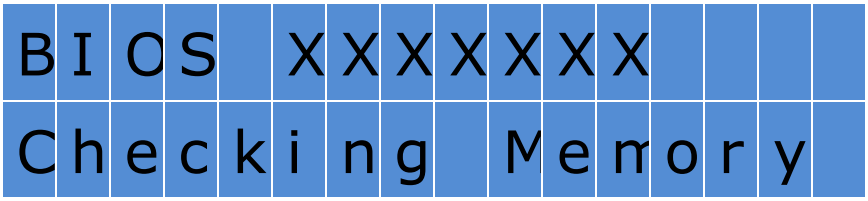
System startup



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 TVS-x82 Series, the LCD panel displays additional booting information after you power on the NAS:



- BIOS xxxxx – xxxx 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

LCD Panel – QTS 4.2.x and below

Refer to QTS 4.2.x User Manual for details.

Chapter 11. Install Power Supply Unit

Note:
This section applies to rackmount NAS models only.
The power supply units of TS-879U-RP and TS-EC879U-RP should only be replaced by an authorized and trained technician.

11.1 1U Turbo NAS with Hot-swappable PSU

Note: The following instructions should only be performed by an authorized and trained technician.

To install a redundant power supply unit to the 1U Turbo NAS, follow the steps below.

1. Turn off the NAS.

2. Remove the screw and dummy plate.

3. Insert the power supply unit and push it to the end.

4. Fasten the screw tightly.

5. Turn on the NAS.

Note: To replace a failed power supply unit, turn off the NAS. Then remove the failed unit safely and repeat steps 3-5 above to install a new power supply unit.

11.2 2U/3U Turbo NAS (TS-853U-RP, TS-1253U-RP only)

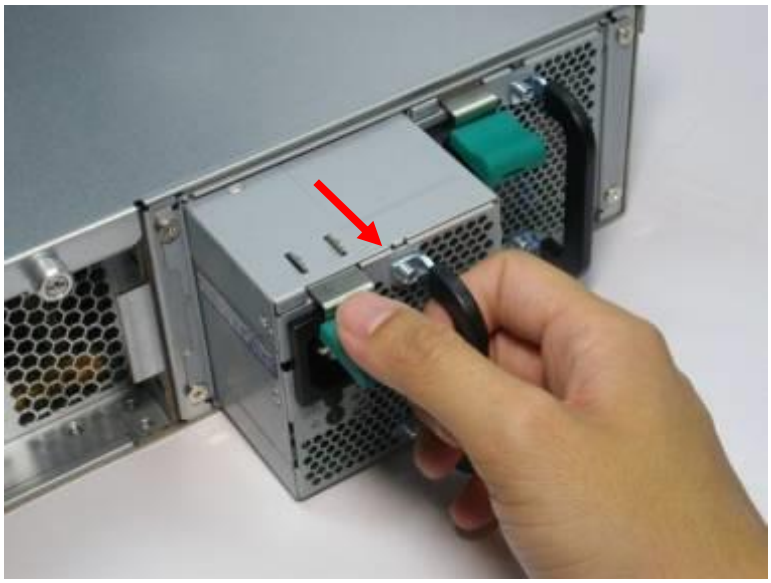
Note: The following instructions should only be performed by an authorized and trained technician.

To replace a failed power supply unit, follow the steps below.

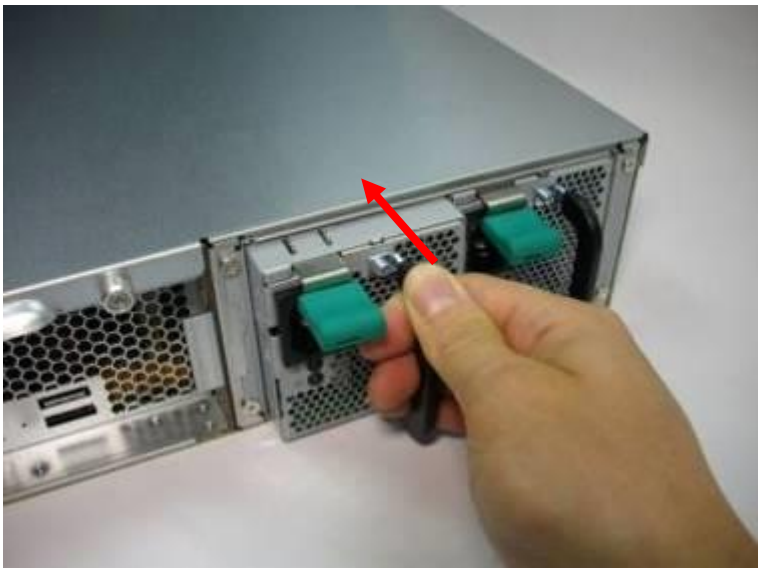
1. Turn off the NAS.

2. Hold the black handler and press and hold the green button firmly.

3. Unplug the failed power supply.



4. Plug in a new power supply to the NAS.



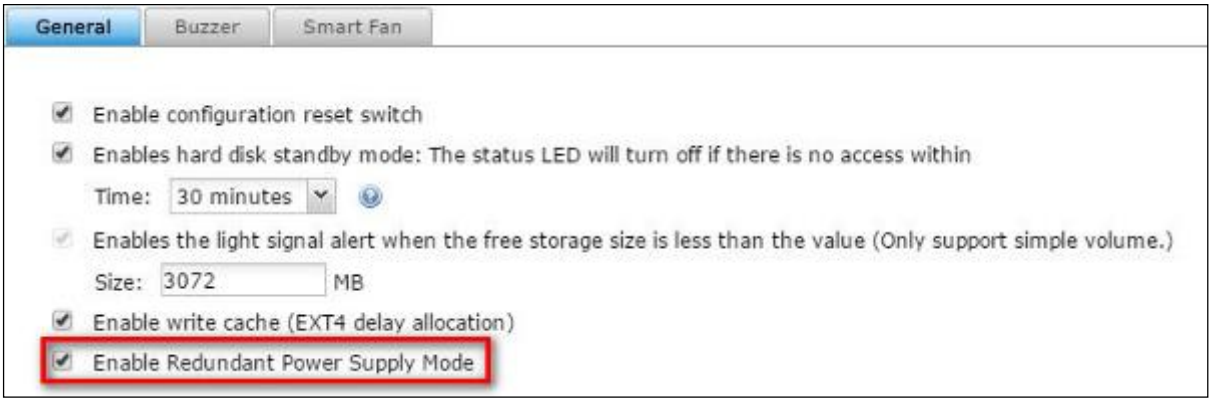
5. Turn on the NAS.

Enable warning alert for redundant power supply on the web-based interface:

If two power supply units (PSU) have been installed on the NAS and connected to the power sockets, both PSU will supply the power to the NAS (applied to 1U and 2U models). Users can enable redundant power supply mode in "System Administration" > "Hardware" to receive warning alert for the redundant power supply. The NAS will beep and record the error messages in "System Logs" when the PSU is plugged out or fails.

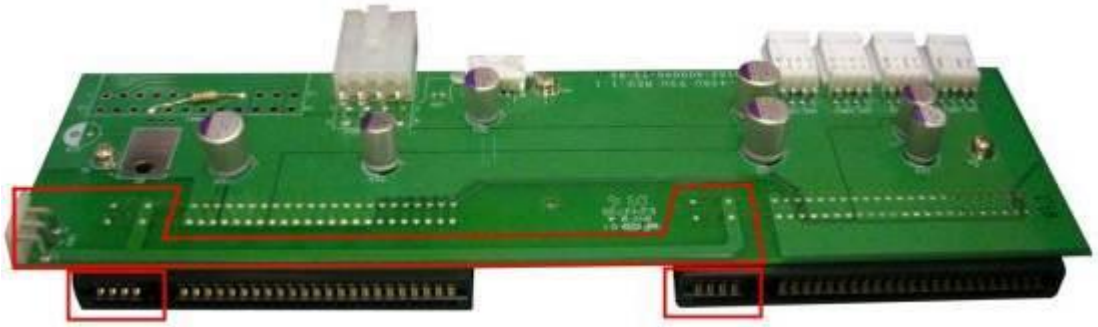
If only one PSU is installed on the NAS, users are suggested NOT to enable this option.

* This function is disabled by default.



WARNING: RISK OF ELECTRIC SHOCK

The connectors on the back panel (bracketed parts below) contain high voltage. Do NOT touch these parts to avoid the risk of electric shock to the maintenance operator.



Technical Support

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

Online Support: http://qnap.com/support
Forum: http://forum.qnap.com

Technical Support in the USA and Canada:
Online Support: http://qnap.com/support
TEL: +1-909-595-2782 #3
Address: 168 University Parkway, Pomona CA 91768
Service Hours: 06:00-18:00 (GMT- 08:00 Pacific Time, Monday to Friday)

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FCC	CE	NAS Models
Class A	Class A	TS-EC1679U-RP, TS-EC1279U-RP, TS-EC879U-RP, TS-1679U-RP, TS-1279U-RP, TS-1270U-RP, TS-1263U-RP, TS-1263U, TS-1253U-RP, TS-1253U, TS-879U-RP, TS-870U-RP, TS-863U-RP, TS-853U-RP, TS-853U, TS-453U-RP, TS-453U, TS-1079 Pro, TS-879 Pro, TS-863U, TS-463U, TS-463U-RP, TS-451U, TS-431U, TVS-871U-RP, TVS-1271U-RP
Class B	Class B	TS-853S Pro, TS-453S Pro, TS-870 Pro, TS-853 Pro, TS-670 Pro, TS-653 Pro, TS-470 Pro, TS-453 Pro, TS-253 Pro, TS-431+, TS-231+, TS-451S, TS-870, TS-851, TS-670, TS-651, TS-470, TVS-863+, TVS-863, TVS-663, TVS-463, TVS-471, TVS-671, TVS-871, TS-451, TS-451+, TS-431, TS-251, TS-251+, TS-251C, TS-231, TS-131, TS-269H, TS-212P, TS-112P, HS-251, HS-251+, HS-210, TS-453Bmini, TS-453mini, TS-563, IS-453S, TS-531P, TS-531X, TS-253A, TS-453A, TS-653A, TS-853A, TS-128, TS-228, TAS-168, TS-268, TBS-453A, TS-831X, TS-251A, TS-451A, TS-1635, TVS-473, TVS-673, TVS-873