

FreeNAS® Mini® and Mini XL® Motherboard Replacement Guide

May 2017 Edition



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INTRODUCTION

This guide shows motherboard removal and replacement for the FreeNAS Mini and the FreeNAS Mini XL.

PREPARATION

A Philips screwdriver is needed for internal screws. Shut down the FreeNAS Mini® or Mini XL® system and unplug the power cable. Make a note of where the data cables are connected and unplug them. If a "Tamper Resistant" sticker is present, removing or cutting it to open the case will not affect the warranty on the unit.

PART I: REMOVING MOTHERBOARD, COMPONENTS, AND CABLES

OPENING THE FREENAS MINI CASE

Unscrew the four thumbscrews on the rear of the Mini:



Slide the black metal cover off the back of the chassis.

OPENING THE FREENAS MINI XL CASE

The FreeNAS Mini XL has two side panels which are removed separately. For a motherboard replacement, remove all four thumbscrews, then slide each panel back and remove it from the chassis.

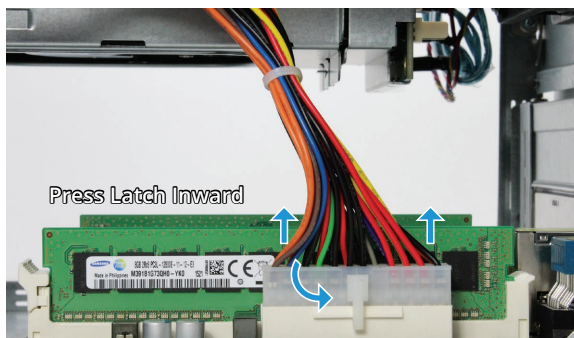


REMOVING THE CABLES AND COMPONENTS

All cables and components must be disconnected or removed before the motherboard can be replaced.

POWER SUPPLY CONNECTOR REMOVAL

The power supply is connected to the motherboard with a 24-pin connector.



Press in on the upper part of the latch and pull the connector upward to disconnect the power supply cable.

Note: Force may be needed as the connector is tight. It helps to hold the motherboard tray in place while pulling upward on the connector.

MEMORY REMOVAL, PART 1

There are four memory slots, two on each side of the motherboard. Memory on the power supply side of the motherboard is removed in this step.

One end of each memory slot has a hinged latch, while the other end has a fixed latch. Press outward and down on the hinged latch to release the memory module from the memory slot.

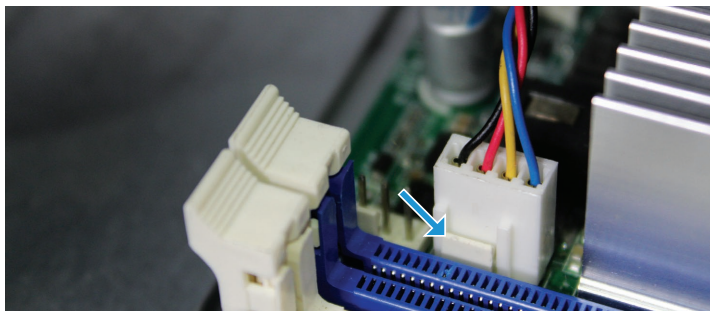


Gently pull upward to remove the memory module from the memory slot. If a second memory module is present, remove it also.



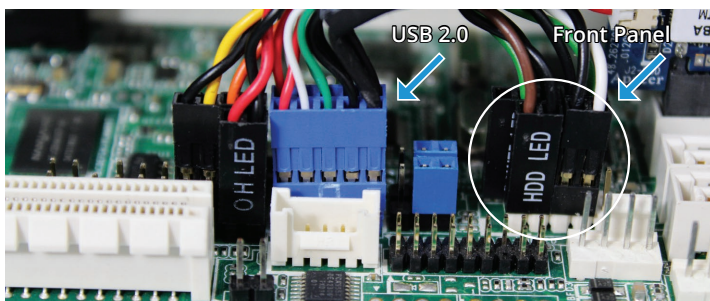
REAR FAN CABLE REMOVAL

Disconnect the fan wire from the Rear_FAN2 connector. Gently pull the wire connector upward. If necessary, flex the locking tab outward with a fingernail to get the connector to release.



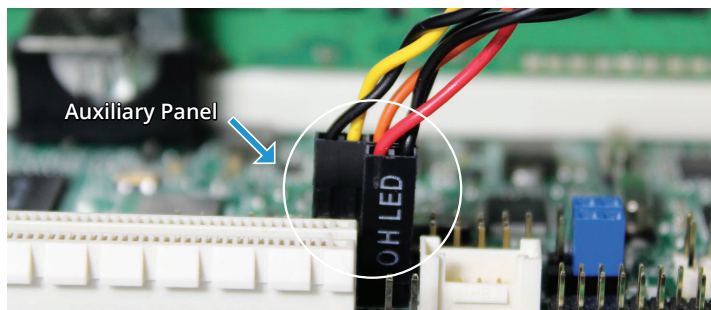
FRONT PANEL AND USB 2.0 CABLE REMOVAL

Switch to the other side of the Mini to remove the four Front Panel Header connectors and the USB 2.0 Header. For each connector, grip the cable and gently pull upward to disconnect.



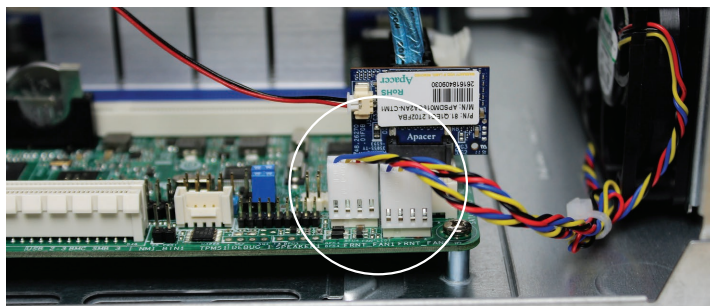
AUXILIARY PANEL CABLE REMOVAL

Remove the three cables connected to the Auxiliary Panel Header. With each connector, grip the wires and gently pull upward to disconnect.



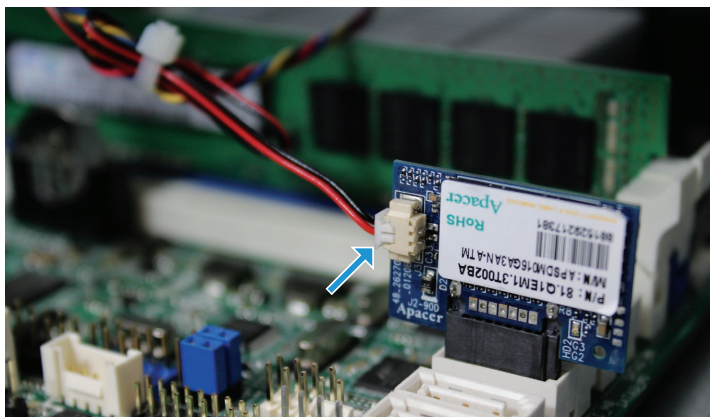
FREENAS MINI XL FRONT FAN CABLE REMOVAL

The Mini XL has two extra fans that connect to the two front fan headers on the motherboard. Disconnect each connector by gripping and gently pulling upward.



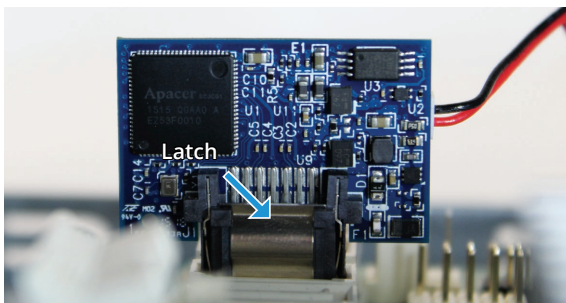
SATADOM POWER CABLE REMOVAL

Gently use thumb and index fingernails to grip the flanges on the SATADOM power connector, then pull to remove it. Be careful, this connector and wires are fragile.



SATADOM REMOVAL

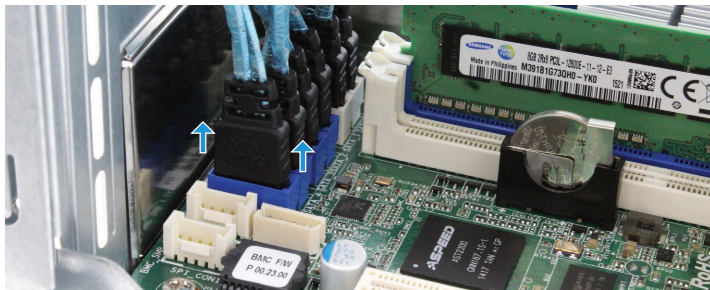
Gently depress the latch while pulling upward to remove the SATADOM from the SATA slot.



FREENAS MINI SATA CABLE REMOVAL

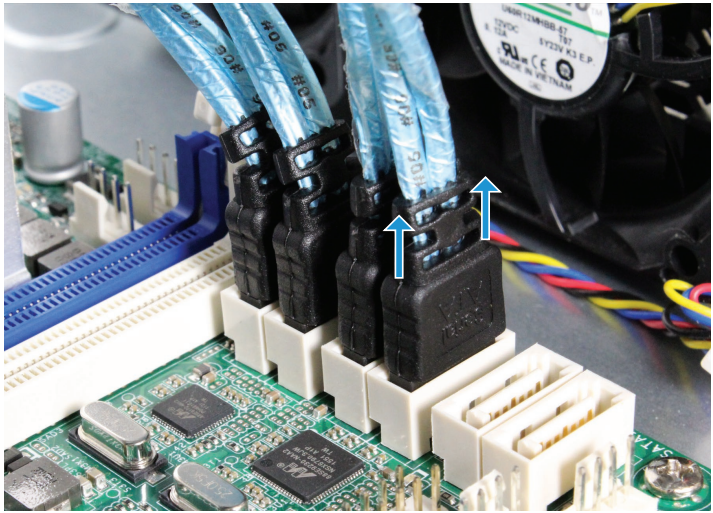
Remove the four SATA cables connected to the blue SATA connectors, and any optional SATA cables connected to the white slots.

Remove each connector individually by gently pulling upward on the black part of the connector.



FREENAS MINI XL SATA CABLE REMOVAL

The FreeNAS Mini XL has four extra SATA cables that are plugged into the white connectors behind the FRNT_FAN2 header. Remove each cable individually by gently pulling upward on the black part of the connector.



MEMORY REMOVAL, PART 2

The remaining memory on this side of the motherboard is removed in this step.

Press the hinged latch outwards to release the memory module from the memory slot.



Gently lift the memory module out of the memory slot. If a second memory module is present, remove it also.



MOTHERBOARD TRAY REMOVAL

Remove the three motherboard tray back panel screws and the two inside edge screws.



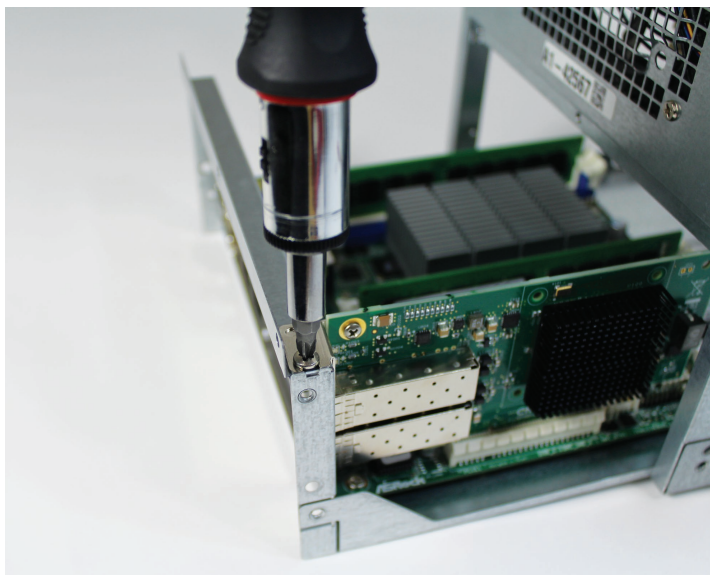
Gently lift and slide the motherboard tray out of the chassis.



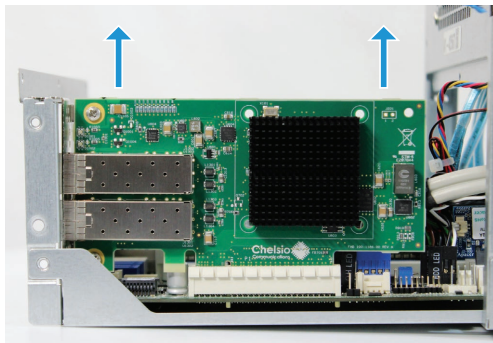
NETWORK INTERFACE CARD (NIC) REMOVAL

Skip this section if the optional network card has not been installed.

Remove the screw attaching the network card bracket to the back panel.

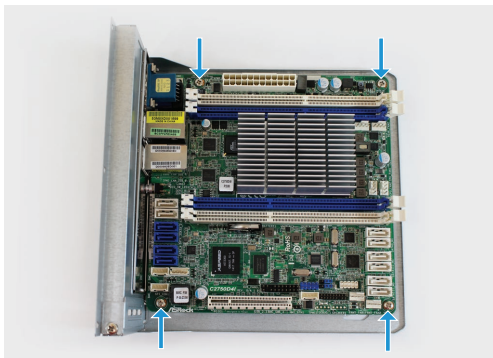


Hold both ends and pull gently upward to remove the NIC from the PCIe slot.



MOTHERBOARD REMOVAL

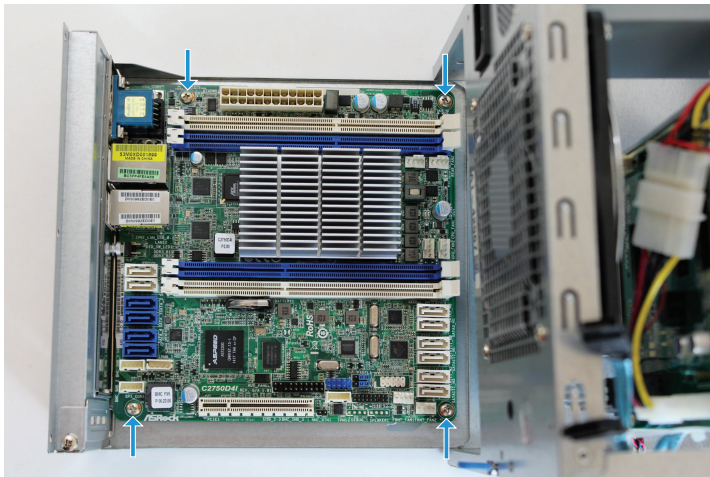
Remove the four screws securing the motherboard in place. Lift to remove the motherboard from the tray.



PART II: INSTALLING MOTHERBOARD, COMPONENTS, AND CABLES

MOTHERBOARD INSTALLATION

Mount the new motherboard in place on the tray with four screws, one at each corner.

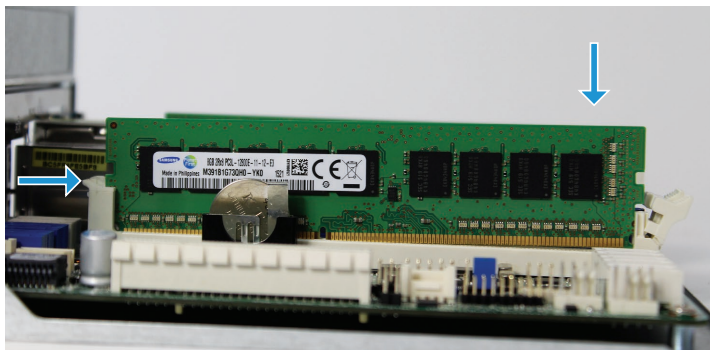


RAM INSTALLATION

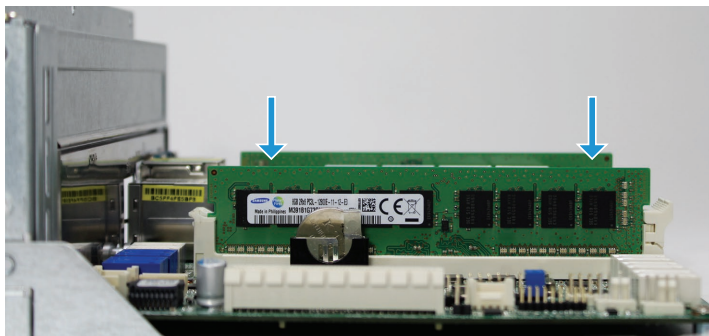
The FreeNAS Mini has four memory slots, a blue and white pair on the same side as the power connector, and another blue and white pair on the opposite side of the chassis. One end of each memory slot has a hinged latch, while the other end has a fixed latch.

Memory is installed in pairs in the same color sockets, blue first, then white.

Gently insert the the memory module into the memory slot, putting the notch on the end of the module under the fixed latch.



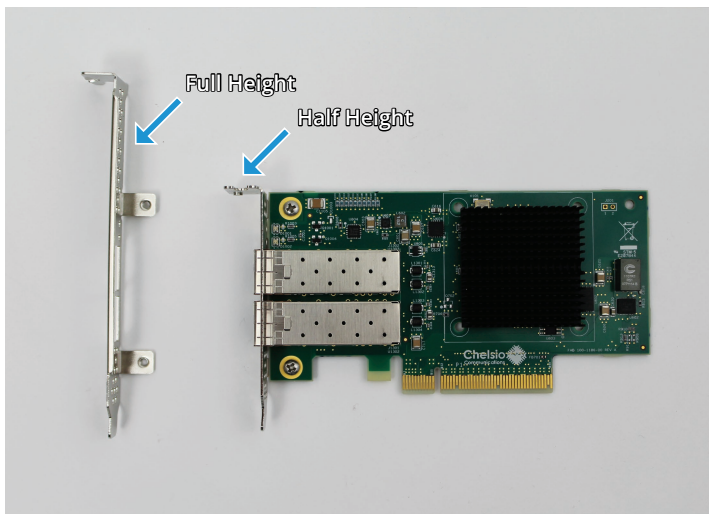
Gently guide the module into the slot, pressing down on both ends of the module until the hinged latch swings in, locking into place.



Repeat for the second memory module, which goes in the same color of slot on the other side of the motherboard

NETWORK INTERFACE CARD (NIC) INSTALLATION

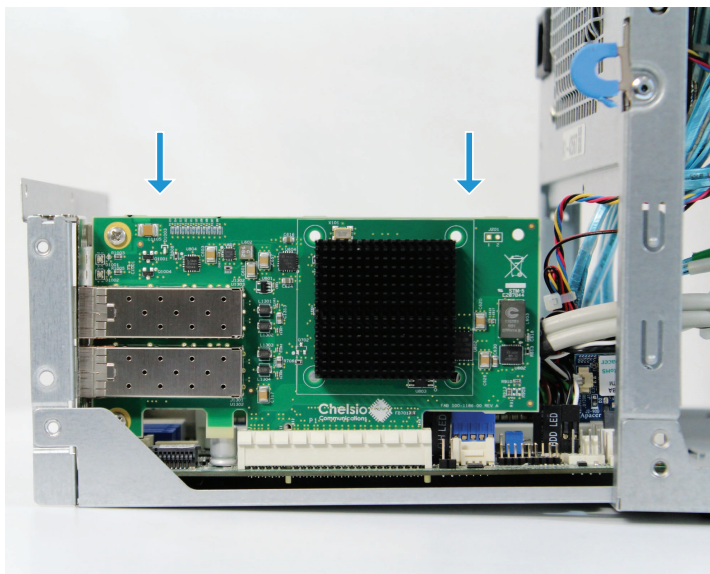
Note: A half height bracket is used on the network card for a FreeNAS Mini. When installed in a FreeNAS Mini XL, a full-height bracket is used.



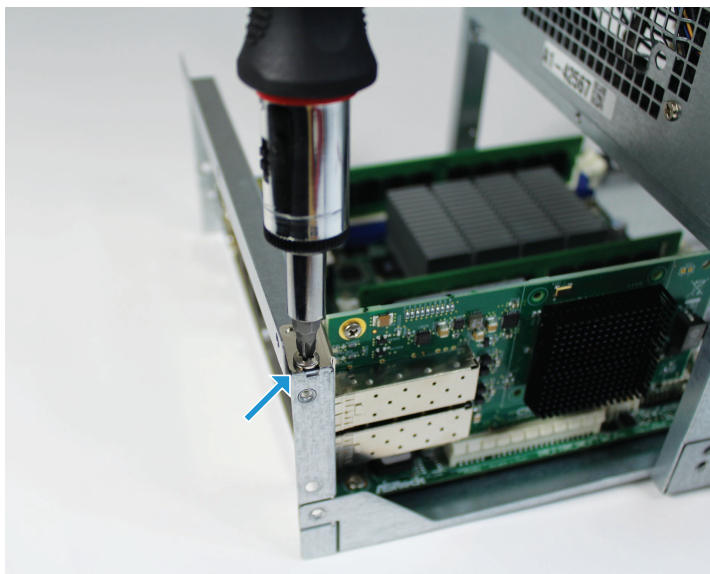
To change the bracket, remove the two retaining screws, exchange brackets, then replace the screws.

Skip this section if the optional network interface card is not present.

The optional network interface card is installed in the PCIe slot. Press down on the ends of the card firmly until it is fully seated.



Use the bracket screw removed earlier to attach the network card to the back panel.



MOTHERBOARD TRAY INSTALLATION

Slide the motherboard tray gently back into place. Replace the three motherboard tray back panel screws and the two inside edge screws.

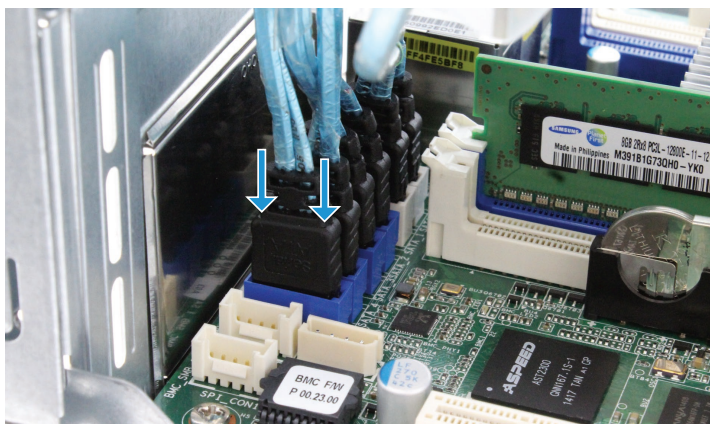


FREENAS MINI SATA CABLE CONNECTION

SATA cable connectors have an L-shaped key and only fit into the motherboard connector one way. Reconnect the SATA cables from the drive bay to the blue motherboard SATA ports. There are two SATA cables for optional SSD cache drives. If present, the SSD cache drives are installed on the top or side of the drive cage. When the optional SSD cache drives are not present, the unused cables are usually zip-tied to the chassis. Connect these cables to the white motherboard SATA ports.

For more information on SSD cache drive installation, see the FreeNAS Mini and XL Hardware Guide at https://www.ixsystems.com/FreeNAS_Mini_HW_Upgrade.pdf.

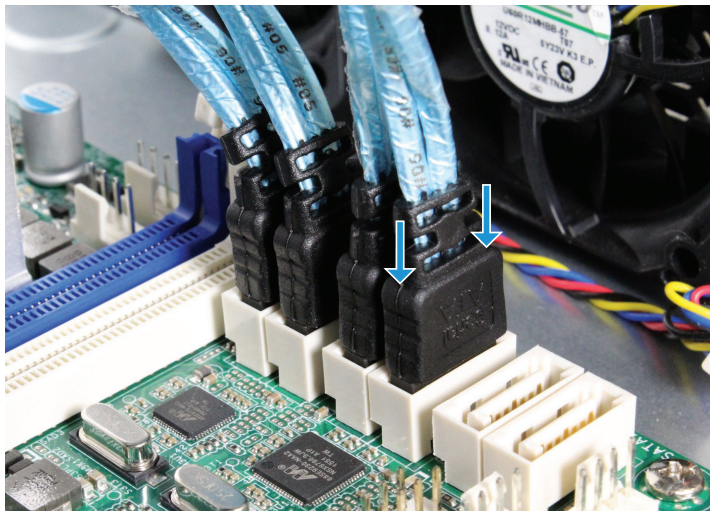
Gently press each connector into place until it stops.



The SATA cables connected to the drive cage might be marked with one to four horizontal lines to show which drive is attached. These marks can be used to sort the cable attachment in drive order.

FREENAS MINI XL SATA CABLE CONNECTION

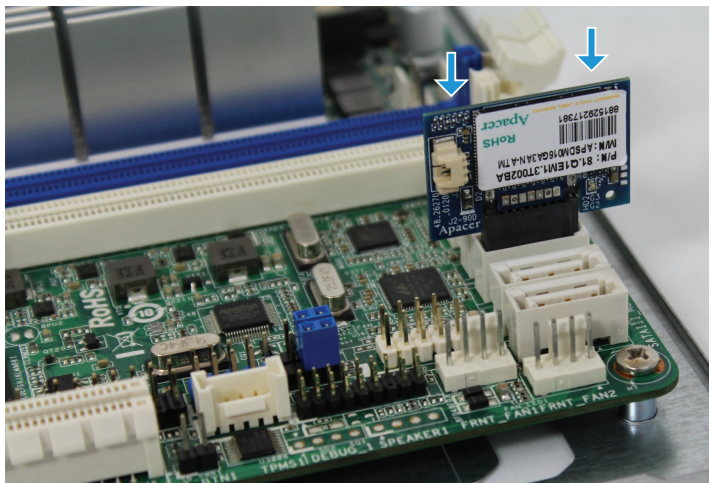
The FreeNAS Mini XL has four extra drive bays that connect to the motherboard SATA cable connectors. These connectors have an L-shaped key and only fit into the motherboard connector one way. Reconnect the six SATA cables connected to the drive cage into any of the blue and white motherboard SATA ports next to the I/O panel.



If the optional SSD cache drives are present, connect their SATA cables to the SATAIII_M2 and SATAIII_M3 motherboard connectors. It does not matter which cable goes to which connector.

FREENAS MINI SATADOM INSTALLATION

Align the SATADOM connector with the SATAIII_M0 slot. Press down until it clicks into place. The connectors both have L-shaped keys that only allow them to be connected one way.



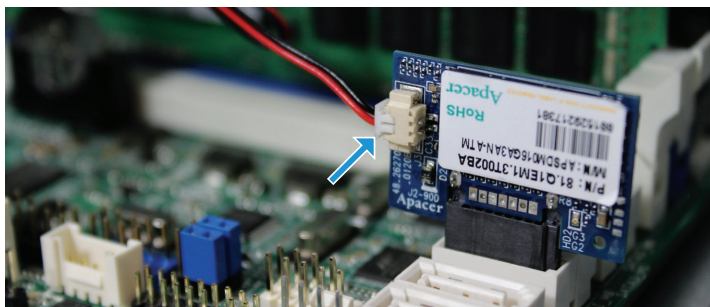
FREENAS MINI XL SATADOM INSTALLATION

Align the SATADOM connector with the SATAIII_M0 slot. Press down until it clicks into place. The connectors both have L-shaped keys that only allow them to be connected one way.



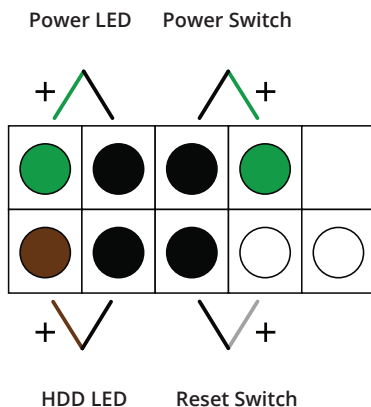
SATADOM POWER CONNECTION

Gently insert the SATADOM power cable with the black wire on top and the red wire on the bottom. The power connector is polarized and only fits this way.



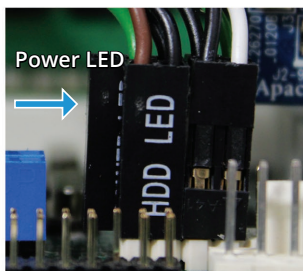
SYSTEM PANEL HEADER CONNECTION

Reattach the System Panel Header connectors. These include the Power LED, HDD LED, Power Switch, and Reset Switch.



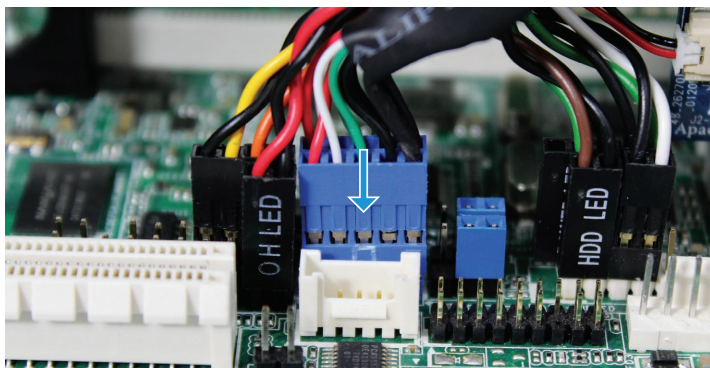
Line up each connector with the correct pins on the header and gently press down until it is fully seated. Make sure wire colors match the diagram above.

Note: The Power LED connector has three holes but only two are used.



USB 2.0 CABLE CONNECTION

Align the 9 pin USB connector with the blue USB connector. One pin of the connector is missing, and one hole on the cable connector is filled. Align the pins and gently press down until the connector is fully seated.

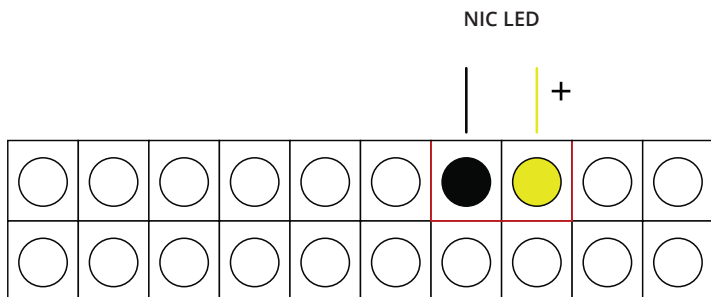


AUXILIARY PANEL CABLE CONNECTION

Reattach the connectors to the 20 pin Auxiliary Panel Header. These connectors include two NIC LED cables and the OH LED cable. Line up each connector with the pins, make sure the wire colors match the diagrams below, and gently press down until the connector is fully seated.

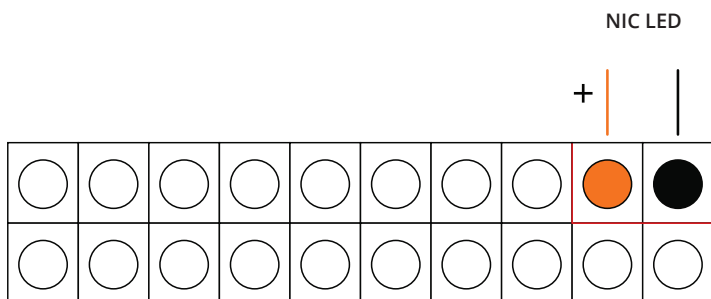
NIC LED (BLACK AND YELLOW)

Insert the first NIC LED connector with the black wire on the left and the yellow (+) wire on the right.



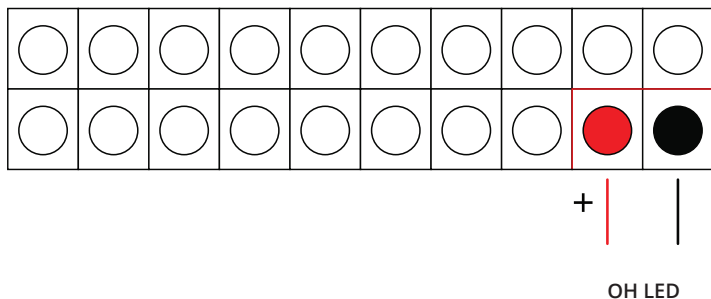
NIC LED (ORANGE AND BLACK)

Insert the second NIC LED connector with the orange (+) wire on the left and the black wire on the right.



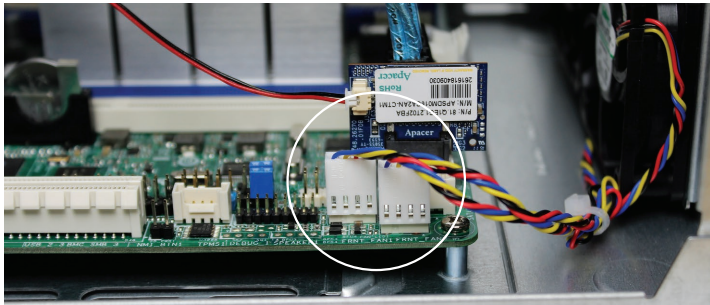
OH LED (RED AND BLACK)

Insert the OH LED connector with the red (+) wire on the left and the black wire on the right.



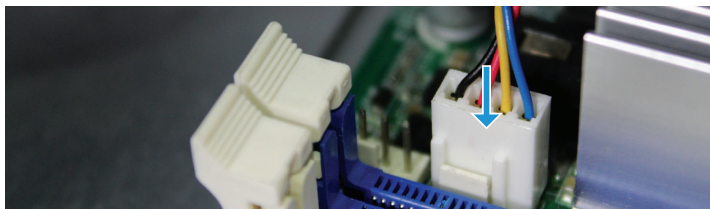
FREENAS MINI XL FRONT FAN CONNECTION

The FreeNAS Mini XL has two extra fan headers which use the fan headers near the SATADOM. Gently press the white fan cable connector down until it is fully seated on the FRNT_FAN1 and FRNT_FAN2 connectors.



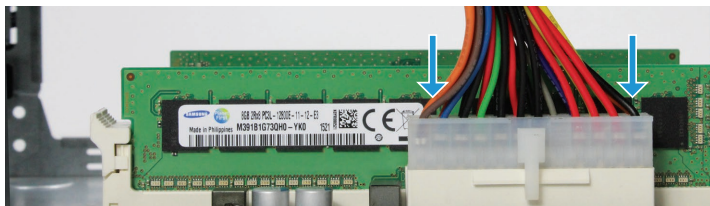
FAN CABLE CONNECTION

Turn the case around so the REAR_FAN2 connector near the CPU heatsink is accessible. This is the side of the system with the power supply connector. Gently press the white fan cable connector down until it is fully seated on the REAR_FAN2 connector next to the heatsink.



POWER SUPPLY CONNECTION

Align the power supply cable with the connector. Press down firmly with both hands until fully seated and the latch is engaged.



CLOSING THE CASE

Slide the case back on, being careful not to pinch any cables. Replace the four thumbscrews in the back.

CONCLUSION

Reconnect the external cables and power on the FreeNAS system. The motherboard replacement is complete.

ADDITIONAL RESOURCES

The FreeNAS Mini and FreeNAS Mini XL support many features and configurations not mentioned in this Motherboard Removal & Replacement Guide.

For help upgrading hardware, refer to the FreeNAS Mini and XL Hardware Upgrade Guide: https://www.ixsystems.com/FreeNAS_Mini_HW_Upgrade.pdf.

For complete documentation: <http://doc.freenas.org>.

The FreeNAS Forums provide an opportunity to interact with other FreeNAS users and to discuss their configurations. Visit the forums: <http://forums.freenas.org>.



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