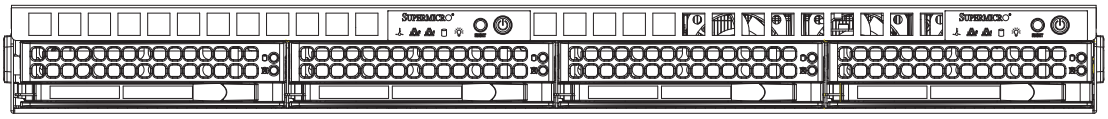
SUPERO®

AS 1021TM-T+
AS 1021TM-INF+



USER'S MANUAL

Revision 1.0a

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WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.0a
Release Date: January 13, 2009

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the 1021TM-T+/1021TM-INF+. Installation and maintenance should be performed by experienced technicians only.

The 1021TM-T+/1021TM-INF+ is a 1U Twin (two serverboards in a 1U chassis) rackmount server based on the SC808TS-980 server chassis and two Super H8DMT+/H8DMT-INF+ serverboards. The H8DMT+/H8DMT-INF+ supports dual AMD Opteron™ 2000 Series processors. Please see our web site for updates on supported processors.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the Super H8DMT+/H8DMT-INF+ serverboard and the SC808TS-980 chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the 1021TM-T+/1021TM-INF+ into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the 1021TM-T+/1021TM-INF+.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the H8DMT+/H8DMT-INF+ serverboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC808TS-980 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS POST Messages

Appendix B: BIOS POST Codes

Appendix C: System Specifications

Notes

Table of Contents

Chapter 1

Introduction

1-1 Overview

The 1021TM-T+/1021TM-INF+ is a "1U Twin" server comprised of the SC808TS-980 1U chassis and two (twin) H8DMT+/H8DMT-INF+ serverboards. Please refer to our web site for information on operating systems that have been certified for use with the 1021TM-T+/1021TM-INF+ (www.supermicro.com/aplus).

In addition to the serverboard and chassis, various hardware components may have been included with the 1021TM-T+/1021TM-INF+, as listed below. Quantities listed are for the complete server (two serverboards).

- Four (4) CPU heatsinks (SNK-P0022+)
- Two (2) air shrouds (MCP-310-80802-0B)
- SATA Accessories:
  Four (4) SATA hard drive carriers (MCP-220-00001-01)
  One (1) internal SATA backplane (BPN-SAS-808)
  Two (2) SATA 43-cm cables (CBL-0226L)
  Two (2) SATA 55-cm cables (CBL-0228L)
- Two (2) PCI-E x16 riser cards (RSC-R1U-E16R)
- Six (6) 4-cm high-performance fans (FAN-0085L)
- Rackmount hardware with screws (CSE-PT51L)
- One (1) CD containing drivers and utilities

1-2 Serverboard Features

At the heart of the SuperServer 1021TM-T+/1021TM-INF+ lies two H8DMT+/ H8DMT-INF+ dual processor serverboards, which are based on the nVidia MCP55V Pro chipset. Below are the main features of the H8DMT+/H8DMT-INF+. Note that the features on each board are doubled for the server.

Processors

Each H8DMT+/H8DMT-INF+ supports dual AMD Opteron™ 2000 Series processors (Socket F type). Please refer to our web site for a complete listing of supported processors (www.supermicro.com/aplus).

Memory

The H8DMT+/H8DMT-INF+ has sixteen single/dual channel DIMM slots that can support up to 64 GB of ECC DDR2-667/533/400 registered ECC SDRAM. All memory modules used to populate the system should be the same size, type and speed.

Serial ATA

The MCP55V Pro chipset includes a Serial ATA controller for 3 Gb/s SATA drives. The hot-swappable SATA drives are connected to a backplane that provides power, bus termination and configuration settings. RAID 0 and 1 are supported.

PCI Expansion Slots

Each H8DMT+/H8DMT-INF+ board has one PCI-Express x16 slot, so two PCI-Express x16 slots are provided in the server. In the 1021TM-T+/1021TM-INF+ server configuration, riser cards have been pre-installed to support two low-profile PCI-Express x16 add-on cards.

Ethernet Ports

An on-chip network controller is integrated into each of the serverboards to support a total of four Gigabit LAN ports (100/1000Base-T/1000BaseTX, RJ45 output).

Onboard Controllers/Ports

Onboard I/O backpanel ports include one COM port, a VGA port, two USB ports, two Gigabit LAN (NIC) ports and (on the 1021TM-INF+ only) an InfiniBand® (MT25204 controller) 20 Gbps port. There are two sets of I/O ports included in the server (one set for each severboard).

InfiniBand Port Bracket: The InfiniBand port bracket is a small "U" shaped bracket that secures the connector to the I/O port shield. This allows the I/O shield, not the serverboard, to support the cable's weight. The bracket can be found on the connector itself.

When installing the serverboard, remove the bracket from the InfiniBand port. Slide the port through the shield, and then replace the bracket to secure the port to the I/O shield.

XGI Graphics Controller

The H8DMT+/H8DMT-INF+ features an integrated graphics controller based on the XGI Z9S graphics chip. The Z9S consumes very little power (1-1.5W) and can display output up to 1600x1200.

Other Features

Other onboard features that promote system health include voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

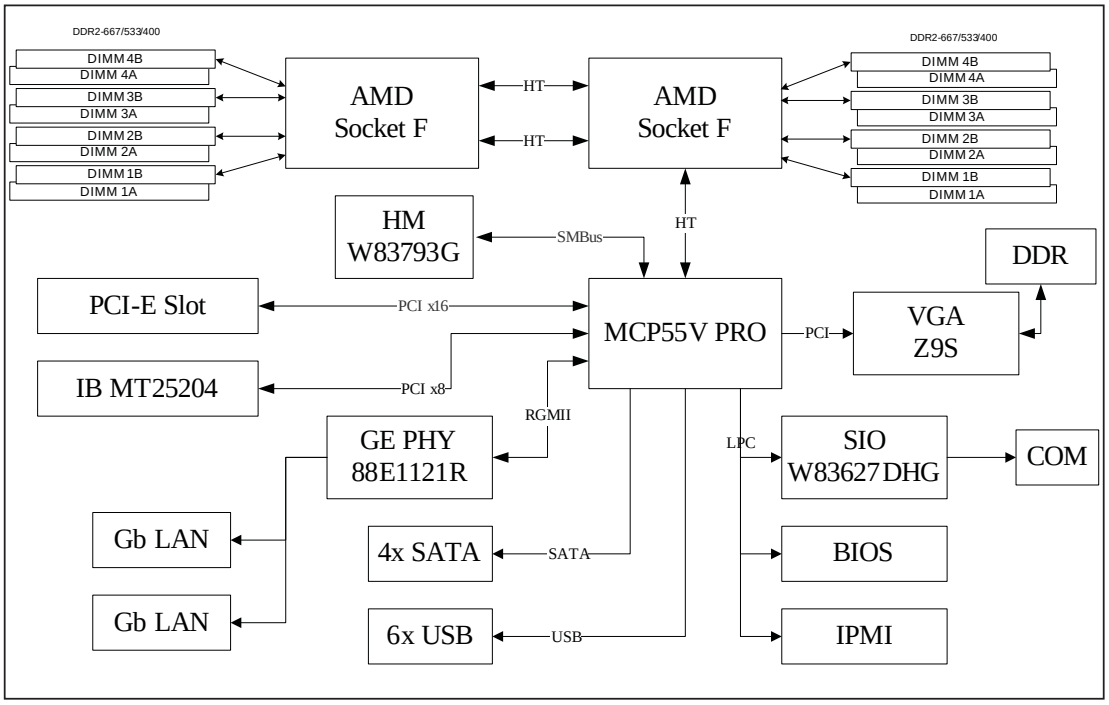

Figure 1-1. nVidia MCP55V Pro Chipset: System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.

1-3 Server Chassis Features

The following is a general outline of the main features of the SC808TS-980 1U chassis. Details on the chassis can be found in Chapter 6.

System Power

When configured as a the 1021TM-T+/1021TM-INF+, the SC808TS-980 includes a single 980W cold-swap power supply, which provides the power to both serverboards housed in the chassis.

SATA Subsystem

The SC808TS-980 chassis was designed to support four SATA hard drives, which are hot-swappable units.

Control Panel

The SC808TS-980 features two independant control panels associated with each serverboard in the chassis. Each control panel has LEDs to indicate power on, network activity, hard disk drive activity and system overheat conditions. Each control panel also includes a main power button and a system reset button.

Rear I/O Panel

The SC808TS-980 is a 1U rackmount chassis. Its I/O panel provides a slots for two low-profile PCI-E x16 expansion cards, two COM ports, four USB ports, two VGA ports and four Gb Ethernet ports. The 1021TM-INF+ also provides two InfiniBand ports. See Chapter 6 for details.

Cooling System

The SC808TS-980 chassis has an innovative cooling design that features two sets of triple (for a total of six) 4-cm high-performance fans. A fan speed control setting in BIOS allows fan speed to be determined by system temperature.

1-4 1U Twin: System Notes

As a 1U Twin configuration, the 1021TM-T+/1021TM-INF+ is a unique server system. With two system boards incorporated into a single chassis, there are several points you should keep in mind.

System Power

A single power supply is used to provide the power for both serverboards. Each serverboard however, can be shut down independently of the other with the power button on its own control panel.

Although they share a common power supply, the I^2C signals used for power supply monitoring are received by the primary serverboard only. (When viewed from the front of the chassis, the serverboard on the left is referred to as the primary board and the serverboard on the right as the secondary.)

SATA Backplane/Drives

As a system, the 1021TM-T+/1021TM-INF+ supports the use of four SATA drives. The SATA backplane works as a single backplane divided into two sections. This means that while a single power connector is used and functions such as overheating apply to both sections together, each pair of SATA drives is logically connected to its own serverboard. Consequently, RAID setup is limited to a two-drive scheme (RAID cannot be spread across all four drives).

1-5 Contacting Supermicro

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Notes

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your 1021TM-T+/1021TM-INF+ up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the 1021TM-T+/1021TM-INF+ was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the 1021TM-T+/1021TM-INF+. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the 1021TM-T+/1021TM-INF+ was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).

- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SATA drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

- Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

This section provides information on installing the 1021TM-T+/1021TM-INF+ into a rack unit with the rack rails provided. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6.

There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails

The chassis package includes two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

Installing the Inner Rails

Both the left and right side inner rails have been pre-attached to the chassis. Proceed to the next step.

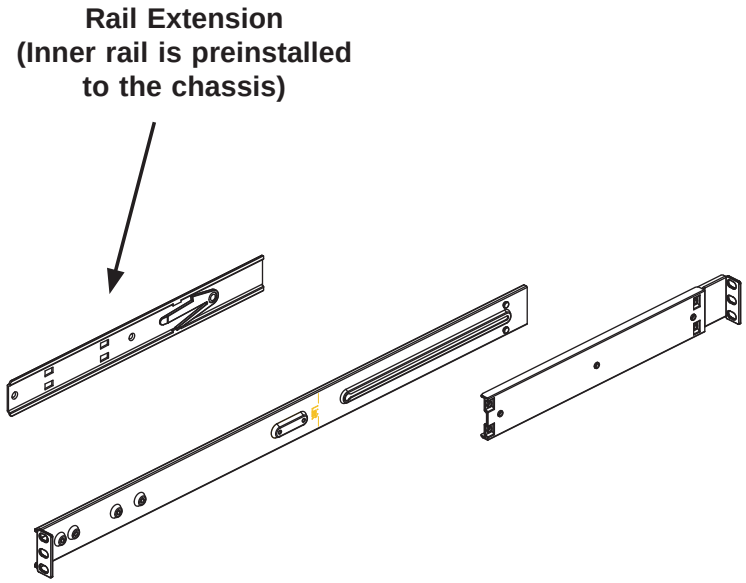


Figure 2-1. Identifying the Sections of the Rack Rails (right side rail shown)

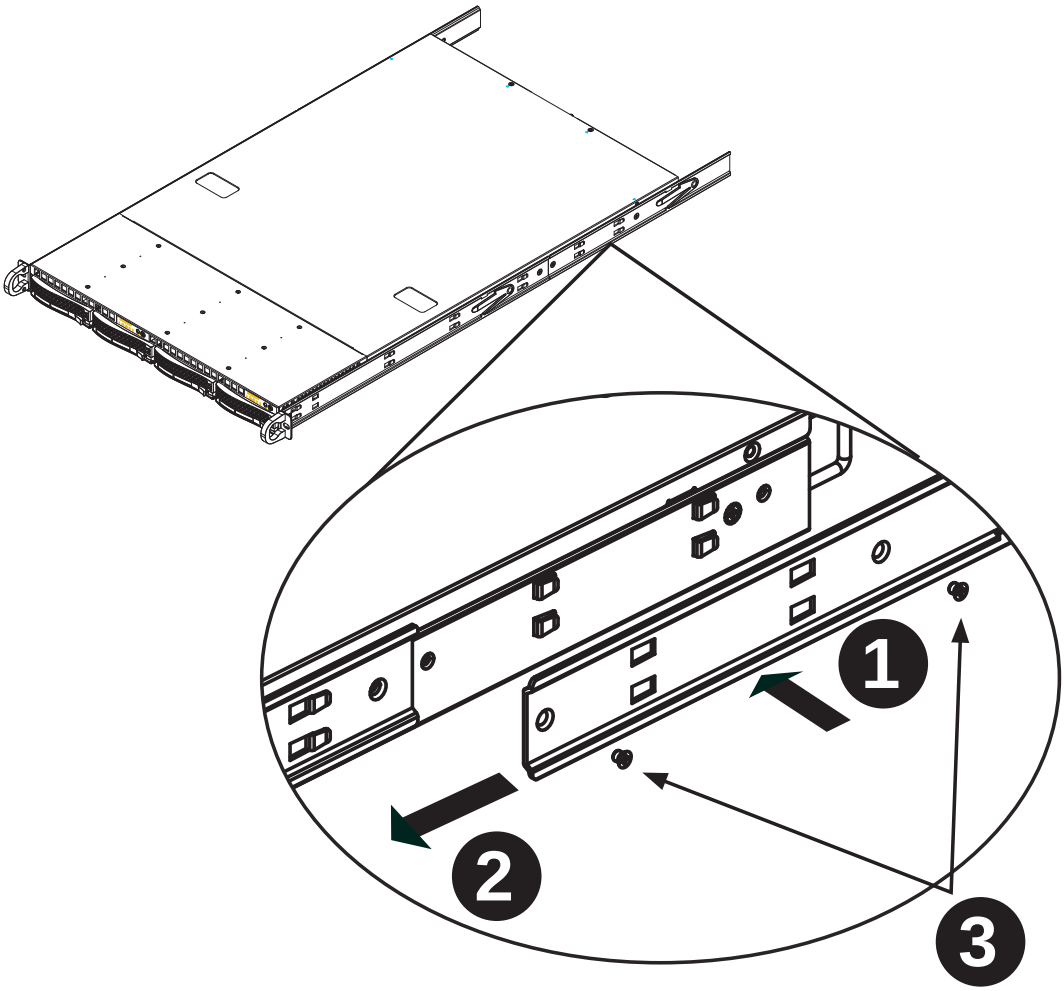


Figure 2-2: Identifying the Sections of the Rack Rails (right side rail shown)

Installing the Inner Rail Extension

The SC808 chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are preattached and do not interfere with normal use of the chassis if you decide not to use a server rack. Attach the inner rail extension to stabilize the chassis within the rack.

Installing the Inner Rails

1. Place the inner rack extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the preattached inner rail.

2. Slide the extension toward the front of the chassis.

3. Secure the chassis with 2 screws as illustrated.

4. Repeat steps 1-3 for the other inner rail extension.

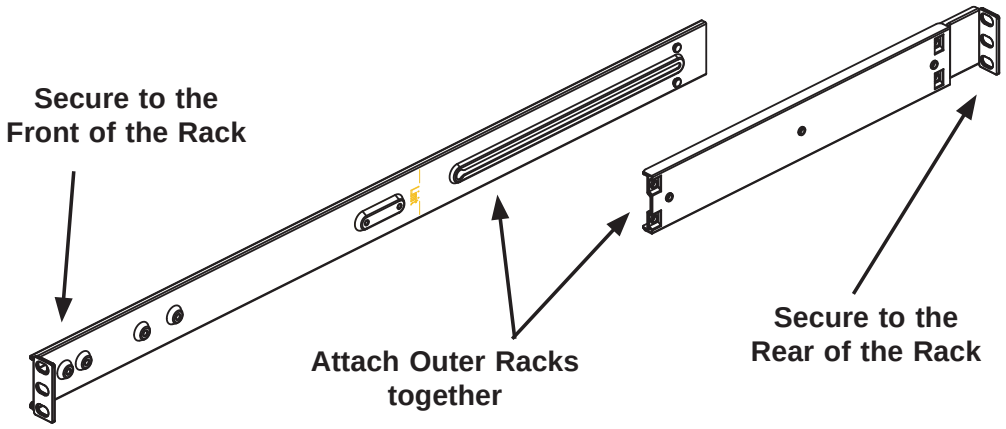


Figure 2-3: Assembling the Outer Rails

Installing the Outer Rails to the Rack

The next step is to install the outer rack rails to the rack.

Installing the Outer Rails

1. Attach the short bracket to the outside of the long bracket. You must align the pins with the slides. Also, both bracket ends must face the same direction.

2. Adjust both the short and long brackets to the proper distance so that the rail fits snugly into the rack.

3. Secure the long bracket to the front side of the outer rail with two M5 screws and the short bracket to the rear side of the outer rail with three M5 screws.

4. Repeat steps 1-4 for the left outer rail.

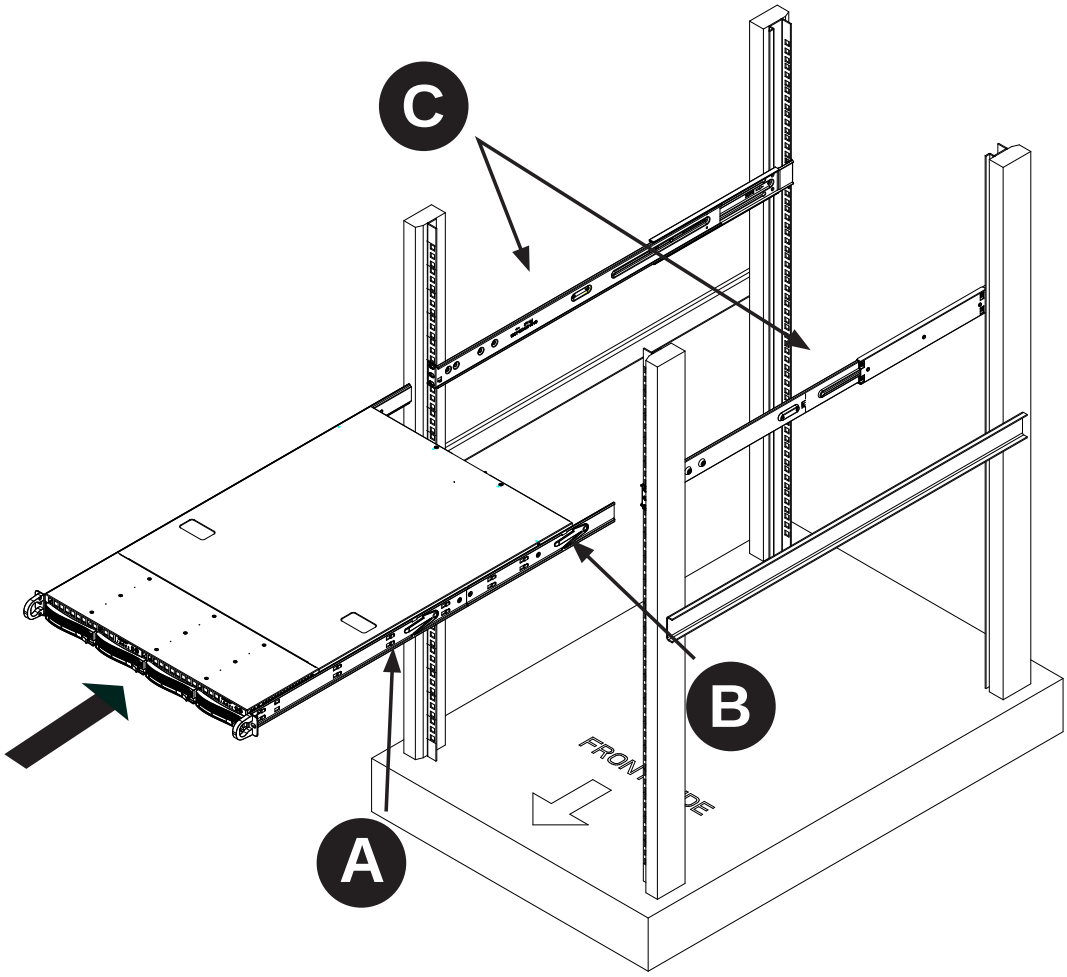


Figure 2-4: Installing the System into a Rack

Installing the Chassis into a Rack

1. Confirm that chassis includes the inner rails (A) and rail extensions (B). Also, confirm that the outer rails (C) are installed on the rack.

2. Line chassis rails (A and B) with the front of the rack rails (C).

3. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the server has been pushed completely into the rack, you should hear the locking tabs "click".

4. (Optional) Insert and tightening the thumbscrews that hold the front of the server to the rack.

2-5 Checking the Serverboard Setup

After you install the 1021TM-T+/1021TM-INF+ in the rack, you will need to open the top cover to make sure the serverboard is properly installed and all the connections have been made.

Accessing the Inside of the System

1. Grasp the two handles on either side and pull the system straight out until it locks (you will hear a "click").

2. Remove the four screws (two on the sides and two on the top) that secure the top cover to the chassis. Place your thumbs in the two rectangular recesses and push the cover away from you (toward the rear of the chassis) until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server (see Figure 2-5).

3. To remove the system from the rack completely, depress the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

Checking the Components and Setup

1. You may have one or two processors already installed in each of the two serverboards. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

2. Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

3. You can install two add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

2-6 Preparing to Power On

Next, you should check to make sure the peripheral drives and the SATA drives and SATA backplane have been properly installed and all connections have been made.

Checking the SATA drives

1. All drives are accessable from the front of the server. The SATA disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SATA drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by six sets of 4-cm fans (each set of fans consists of two fans that are mounted back to back) and an air shroud. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

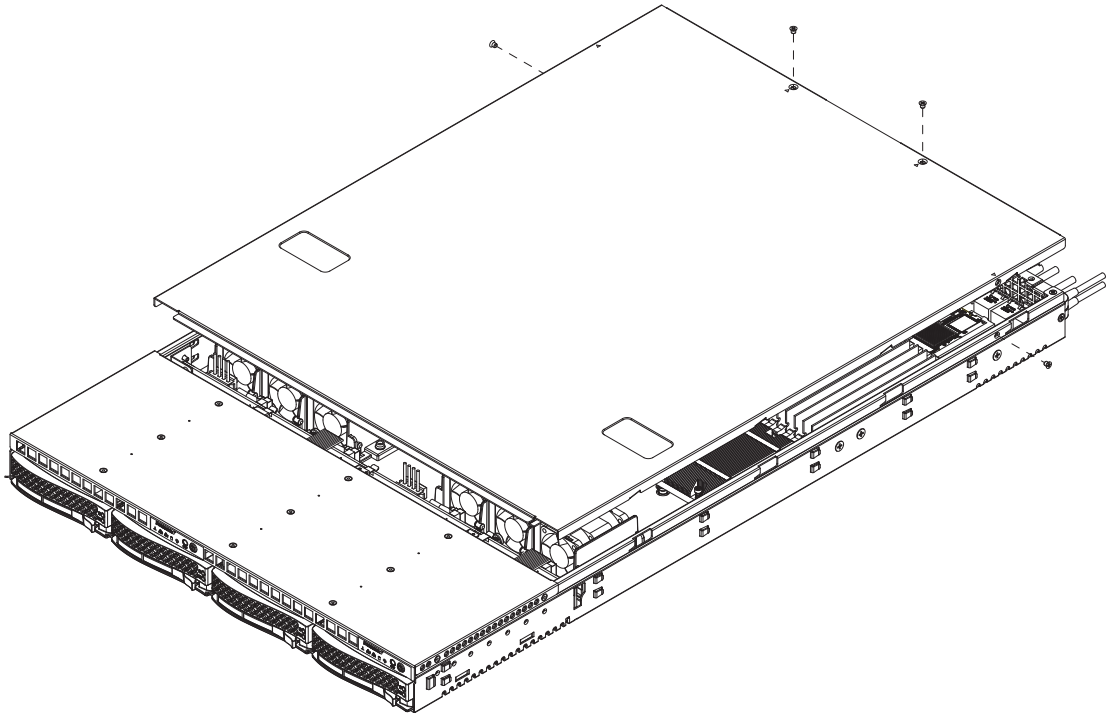
Providing Power

1. Plug the power cords from the power supplies unit into a high-quality power strip that offers protection from electrical noise and power surges.

2. It is recommended that you use an uninterruptible power supply (UPS).

3. Finally, depress the power on button on the front of the chassis.

Figure 2-5. Accessing the Inside of the System



Chapter 3

System Interface

3-1 Overview

There are several LEDs on the two control panels as well as others on the SATA drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on each control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take. Note that the server has two control panels, one for each serverboard installed in the system. This allows each severboard to be controlled independently of the other.

3-2 Control Panel Buttons

There are two push-buttons located on each control panel: a reset button and a power on/off button.

Reset

Depressing the reset button will reboot only the serverboard it is associated with.

Power

This is the main power button, which is used to apply or turn off the main system power only to the serverboard it is connected to. Depressing this button removes the main power but keeps standby power supplied to the serverboard.

3-3 Control Panel LEDs

Each of the two control panels located on the front of the SC808TS-980 chassis has five LEDs. Each LED provides you with critical information related its own specific serverboard. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Overheat/Fan Fail

When this LED flashes, it indicates a fan failure. When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists.

NIC2

Indicates network activity on LAN2 when flashing

NIC1

Indicates network activity on LAN1 when flashing.

HDD

Channel activity for the hard disk drives. This light indicates SATA drive activity on the 1021TM-T+/1021TM-INF+ when flashing.

Power

Indicates power is being supplied to the system's power supply unit. This LED should normally be illuminated when the system is operating.

3-4 SATA Drive Carrier LEDs

Each SATA drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SATA drive carrier indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** There is no function associated with the red LED.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 1021TM-T+/1021TM-INF+ from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard and memory modules. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the 1021TM-T+/1021TM-INF+ clean and free of clutter.

- The 1021TM-T+/1021TM-INF+ weighs approximately 40 lbs (~18.2 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

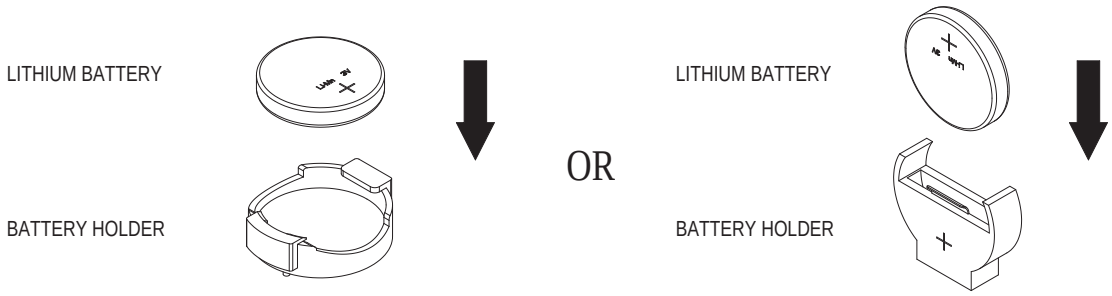
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 1021TM-T+/1021TM-INF+ is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the H8DMT+/H8DMT-INF+ serverboard into the SC808TS-980 chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

5-1 Handling the Serverboard

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the H8DMT+/H8DMT-INF+ serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrostatic discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Serverboard Installation

This section explains the first step of physically mounting the H8DMT+/H8DMT-INF+ into the SC808TS-980 chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the serverboard, follow the procedure in reverse order.

Accessing the Inside of the System

1. Remove all four screws securing the top cover of the chassis: two at the top rear of the cover and one on each side lip, also near the back.

2. Place both thumbs in the indentations and push the cover back until it slides off.

3. Lift the top cover from the chassis to gain full access to the inside of the server. (If already installed in a rack, you must first release the retention screws that secure the unit to the rack, then grasp the two handles on either side and pull the unit straight out until the rails lock into place. See Figure 2-5.)

Check Compatibility of Serverboard Ports and I/O Shield

1. The H8DMT+/H8DMT-INF+ in a Twin 1U configuration requires the use of Supermicro's specially designed 1U Twin chassis: the SC808TS-980.

2. Make sure that the I/O ports on the serverboards align properly with their respective holes in the I/O shield at the back of the chassis when installing.

Mounting the Serverboard onto the Serverboard Tray

1. Carefully mount the serverboards by aligning the board holes with the raised metal standoffs that are visible in the chassis.

2. Insert screws into all the mounting holes on your serverboards that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads).

3. Metal screws provide an electrical contact to the serverboard ground to provide a continuous ground for the system.

5-3 Connecting Cables

Now that the serverboards are installed, the next step is to connect the cables to the boards. These include the data cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the serverboard layout for connector locations.) Note that each connection listed should be made for both serverboards in the chassis.

- SATA drive cables (SATA0 ~ SATA1)
- Control Panel cable (JF1)

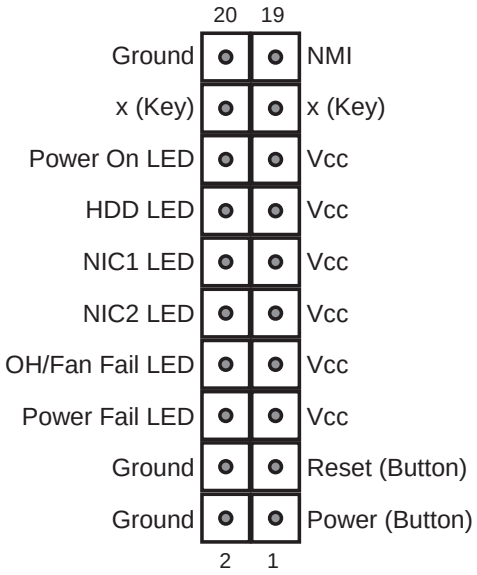
Connecting Power Cables

The H8DMT+/H8DMT-INF+ has two 20-pin proprietary power supply connectors for connection to the power supply. Only one of these from each board should be connected to the power supply. JWR1 is used to supply power to the primary serverboard and JWR2 is used to supply power to the secondary serverboard. Connect the power supply to only one of these on both boards (primary = left, secondary = right when viewed from front of server). See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators. All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis.

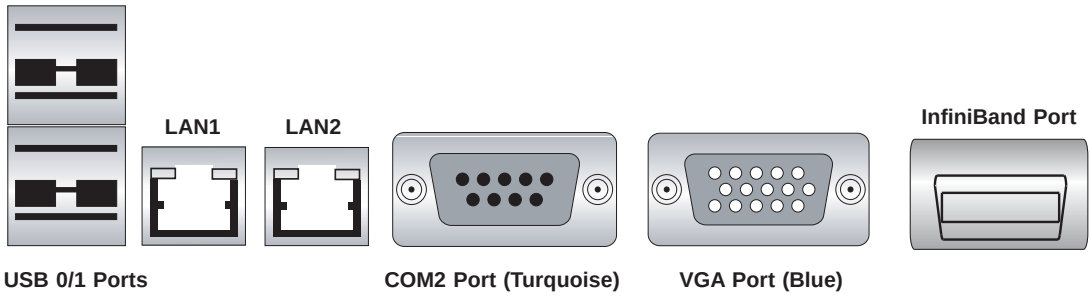
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Ports



Note: The InfiniBand port is included on the H8DMT-INF+ (1021TM-INF+) only. To prevent damage to the port or serverboard, an InfiniBand bracket (included) must be used to secure the connector to the I/O shield.

5-5 Processor and Heatsink Installation

When handling the processor, avoid placing direct pressure on the label area of the fan. Also, do not place the serverboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up. Always connect the power cord last and remove it first before adding, removing or changing any hardware components.

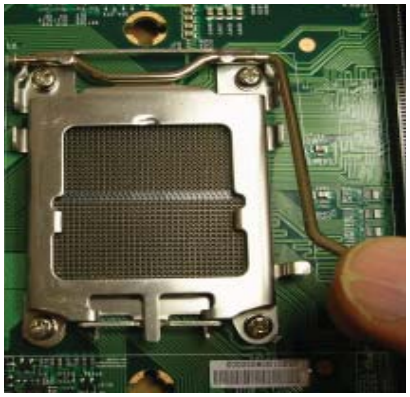
Installation Procedure

Follow the procedures as listed below to install the motherboard into a chassis.

1. Install the processor(s) and the heatsink(s).
2. Install the motherboard in the chassis.
3. Install the memory and add-on cards.
4. Finally, connect the cables and install the drivers.

Installing the Processors

1. Begin by removing the cover plate that protects the CPU. Lift the lever on the CPU socket until it points straight up. With the lever raised, lift open the silver CPU retention plate.



2. Use your thumb and your index finger to hold the CPU. Locate and align pin 1 of the CPU socket with pin 1 of the CPU. Both are marked with a triangle.

3. Align pin 1 of the CPU with pin 1 of the socket. Once aligned, carefully place the CPU into the socket. *Do not drop the CPU on the socket, move the CPU horizontally or vertically or rub the CPU against the socket or against any pins of the socket, which may damage the CPU and/or the socket*.

4. With the CPU inserted into the socket, inspect the four corners of the CPU to make sure that it is properly installed and flush with the socket. Then, gently lower the silver CPU retention plate into place.

5. Carefully press the CPU socket lever down until it locks into its retention tab. For a dual-CPU system, repeat these steps to install another CPU into the CPU#2 socket (and into CPU#2, #3 and #4 sockets for a quad-CPU configuration).

Note: in single and dual-CPU configurations, memory must be installed in the DIMM slots associated with the installed CPU(s). Memory is limited to a maximum of 32 for single CPU and 64 GB for dual CPU configurations.

Installing the Heatsinks

We recommend the use of active type heatsinks (except for 1U systems). Use any onboard fan header for the CPU's heatsink fan. To install the heatsink, please follow the installation instructions included with your heatsink package (not included).

5-6 Installing Memory

CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Memory support

The H8DMT+/H8DMT-INF+ has sixteen 240-pin DIMM sockets that can support up to 64 GB of single or dual channel DDR2-667/533/400 registered ECC SDRAM (for a total of 128 GB in the system).

Installing Memory

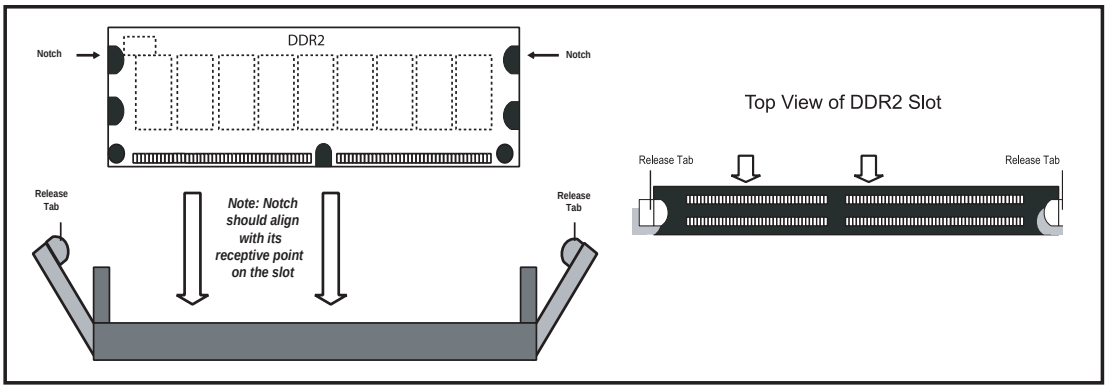
1. Insert each memory module vertically into its slot, paying attention to the notch along the bottom of the module to prevent inserting the module incorrectly (see Figure 2-1).

2. Install to slots CPU1/DIMM1A and CPU1/DIMM1B first, then to CPU1/DIMM2A and CPU1/DIMM2B, etc. Always install in pairs and in the numerical order of the DIMM slots. See support information below.

3. Gently press down on the memory module until it snaps into place.

4. With two CPUs installed, repeat step 2 to populate the CPU2 DIMM slots. Always install pairs of DIMMs to both CPU DIMM slots for more efficient operation.

Figure 5-3. DIMM Installation



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notches.
To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

Note: 256 MB, 512 MB, 1 GB, 2 GB and 4 GB memory modules are supported. It is highly recommended that you remove the power cord from the system before installing or changing memory modules. Please refer to our web site for memory that has been tested on the H8DMT+/H8DMT-INF+.

Support

The H8DMT+/H8DMT-INF+ supports single or dual-channel, DDR2-667/533/400 registered ECC SDRAM. Only interleaved memory is supported, so you must populate two DIMM slots at a time (see procedure above).

Populating two adjacent slots at a time with memory modules of the same size and type will result in interleaved (128-bit) memory, which is faster than non-interleaved (64-bit) memory.

Maximum Memory

64 GB of DDR2-667/533/400 registered ECC SDRAM in each serverboard.

5-7 Adding PCI Cards

PCI-Express 2.0 Slot

The 1021TM-T+/1021TM-INF+ includes two preinstalled riser cards designed specifically for use in the SC808T-980 1U rackmount chassis. These riser cards support two low-profile PCI-Express cards to fit inside the chassis.

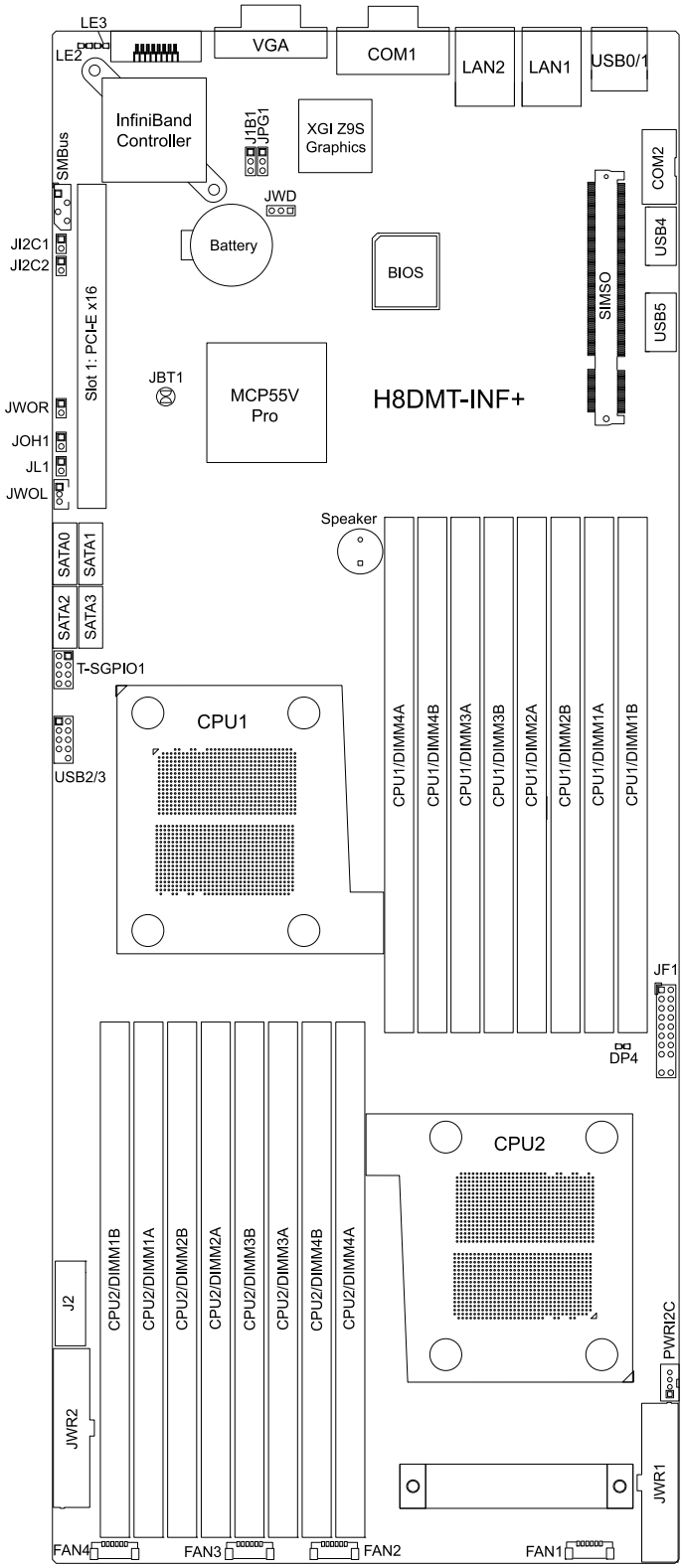
PCI Card Installation

The riser card has already been preinstalled into the serverboard. Perform the following steps to add a PCI add-on card:

1. Remove the PCI slot shield on the chassis by releasing the locking tab.
2. Insert the add-on card into the riser card.
3. Secure the add-on card with the locking tab.

5-8 Serverboard Details

Figure 5-4. H8DMT+/H8DMT-INF+ Layout



Jumpers not indicated are for test purposes only.

H8DMT+/H8DMT-INF+ Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 5-10)
JI²C1/JI²C2	I²C to PCI-E Slot	Both Closed (Enabled)
J1B1*	InfiniBand Enable/Disable	Pins 1-2 (Enabled)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	Description
COM1/COM2	COM1 Serial Port/Header
FAN 1-4	Chassis/CPU Fan Headers
J2	Auxilliary Power Connector (for IDE drives)
JF1	Front Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat Warning Header
JWOL	Wake-On-LAN Header
JWOR	Wake-On-Ring Header
JWR1	20-pin Proprietary Power Connector
JWR2	20-pin Proprietary Power Connector
LAN1/2	Gigabit Ethernet (RJ45) Ports
PWRI²C	Power I²C Header
SATA0 ~ SATA3	SATA Ports
SIMSO	SIMSO (Remote Management) Slot
SMBus	System Management Bus Header
T-SGPIO-1	Serial General Purpose Input/Output Header
USB0/1, USB2/3	Universal Serial Bus (USB) Headers
USB4/5	Universal Serial Bus (USB) Ports (Type A)

LED	Description
DP4	Onboard Power LED
LE2*	InfiniBand Physical Link LED (Green)
LE3*	InfiniBand Logical Link LED (Yellow)

*H8DMT-INF+ only.

5-9 Connector Definitions

Proprietary Power Connector

The primary power supply connectors (JWR1 and JWR2) are designed for use with Supermicro proprietary power supplies. Refer to the table on the right for the pin definitions of the 20-pin power connectors. This connection supplies power to the chipset, fans and memory.

20-pin Power Connector Pin Definitions (JWR1, JWR2)

Pin#	Definition	Pin #	Definition
11	PS_ON_N	1	GND_1
12	5V_STBY	2	GND_2
13	GND_6	3	GND_3
14	GND_7	4	GND_4
15	GND_8	5	GND_5
16	NC2	6	NC1
17	12V_5	7	12V_1
18	12V_6	8	12V_2
19	12V_7	9	12V_3
20	12V_8	12	12V_4

Auxiliary Power Connector

A 4-pin 12V auxiliary power connector is included to provide power to hard drive disks. See the table on the right for pin definitions.

Auxiliary Power Pin Definitions (J2)

Pin#	Definition
1	+12V
2	Ground
3	Ground
4	+5V

PW_ON Connector

The PW_ON connector is on pins 1 and 2 of JF1. This header should be connected to the chassis power button. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Overheat/Fan Fail LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating or fan failure. Refer to the table on the right for pin definitions and status indicators.

OH/Fan Fail LED Pin Definitions (JF1)

Pin#	Definition
7	Vcc
8	Control

OH/Fan Fail LED Status

State	Indication
Solid	Overheat
Blinking	Fan fail

NIC2 (LAN2) LED

The LED connections for LAN2 are on pins 9 and 10 of JF1. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)

Pin#	Definition
9	Vcc
10	Ground

NIC1 (LAN1) LED

The LED connections for LAN1 are on pins 11 and 12 of JF1. Attach LAN LED cables to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)

Pin#	Definition
11	Vcc
12	Ground

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including Serial ATA and IDE). See the table on the right for pin definitions

HDD LED Pin Definitions (JF1)

Pin#	Definition
13	Vcc
14	HD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	5V Stby
16	Control

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions. This is unused on the 1021TM-T+/1021TM-INF+.

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

Universal Serial Bus Ports

Two Universal Serial Bus ports (USB 2.0) are located beside the LAN1/2 ports. Two additional Type A ports (USB4/5) are included on the motherboard near the SIMSO slot. See the table on the right for pin definitions.

Universal Serial Bus Ports Pin Definitions (USB0/1, USB4/5)

USB0		USB1	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground

USB Headers

Two USB 2.0 headers (USB2/3) are also included on the motherboard. These may be connected to provide front side access. A USB cable (not included) is needed for the connection. See the table on the right for pin definitions.

Universal Serial Bus Headers Pin Definitions (USB2/3)

USB2		USB3/4	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	No connection

Serial Ports

The COM1 serial port is located beside the VGA port. Refer to the motherboard layout for the location of the COM2 header. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)

Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: NC indicates no connection.

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion. This is unused on the 1021TM-T+/1021TM-INF+.

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Battery voltage
2	Intrusion signal

Fan Headers

The H8DMT+/H8DMT-INF+ has four 6-pin proprietary fan headers. Each fan header supports two 3-pin fans. See the table on the right for pin definitions.

Note: The onboard fan speed is controlled by the CPU die temperature.

Fan Header Pin Definitions (Fan1 - Fan4)

Pin #	Definition	Pin #	Definition
1	PWR (DC Speed CTRL)	4	Ground
2	Tachometer for Fan 1/3/5	5	Tachometer for Fan 2/4/6
3	Ground	6	PWR (DC Speed CTRL)

LAN1/2 (Ethernet Ports)

Two Gigabit Ethernet ports (designated LAN1 and LAN2) are located beside the COM2 port. These Ethernet ports accept RJ45 type cables.

Overheat LED

Connect an LED to the JOH1 header to provide warning of chassis overheating. See the table on the right for pin definitions.

Overheat LED Pin Definitions (JOH1)

Pin#	Definition
1	3.3V
2	OH Active

Power I²C

The JPI²C header is for power I²C, which may be used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

Power I²C Pin Definitions (JPI²C)

Pin#	Definition
1	Data
2	Ground
3	Clock
4	NC

Wake-On-LAN

The Wake-On-LAN header is designated JWOL. See the table on the right for pin definitions. You must have a LAN card with a Wake-On-LAN connector and cable to use the Wake-On-LAN feature.

Wake-On-LAN Pin Definitions (JWOL)

Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-On-Ring Pin Definitions (JWOR)

Pin#	Definition
1	Ground (Black)
2	Wake-up

SMBus Header

The header at SMBus is for the System Management Bus. Connect the appropriate cable here to utilize SMB on the system. See the table on the right for pin definitions.

SMBus Header Pin Definitions (SMBus)

Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

SGPIO

The T-SGPIO1 (Serial General Purpose Input/Output) header provides a bus between the SATA controller and the SATA drive backplane to provide SATA enclosure management functions. Connect the appropriate cables from the backplane to the T-SGPIO1 header to utilize SATA management functions on your system.

SGPIO Header Pin Definitions (T-SGPIO1)

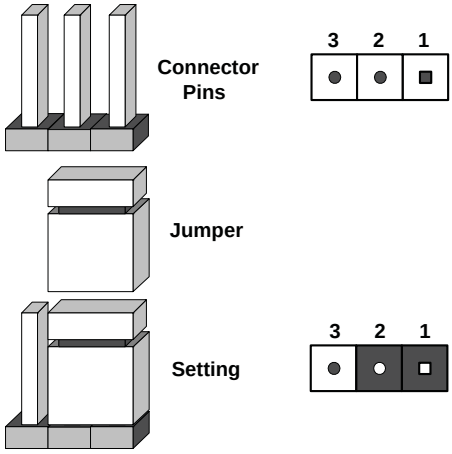
Pin#	Definition	Pin #	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	NC	8	NC

Note: NC indicates no connection.

5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram at right for an example of jumping pins 1 and 2. Refer to the motherboard layout page for jumper locations.



Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To Clear CMOS

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS.*

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

I2C to PCI-Express Slot

JI²C1/JI²C2 allows you to enable the I²C bus to communicate with the PCI-Express slot. For the jumpers to work properly, please set both jumpers to the same setting. If enabled, both jumpers must be enabled. If disabled, both jumpers must be disabled. See the table on the right for jumper settings.

I²C to PCI-Express Slot Jumper Settings (JPI²C1/JPI²C2)

Jumper Setting	Definition
Closed	Enabled
Open	Disabled

Watch Dog Enable/Disable

JWD enables the Watch Dog function, a system monitor that takes action when a software application freezes the system. Jumping pins 1-2 will have WD reboot the system if a program freezes. Jumping pins 2-3 will generate a non-maskable interrupt for the program that has frozen. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Watch Dog Jumper Settings (JWD)

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

Note: when Watch Dog is enabled, the user must write their own application software to disable the Watch Dog Timer.

InfiniBand Port Enable/Disable

J1B1 enables or disables the InfiniBand port on the H8DMT-INF+. The default position is on pins 1 and 2 to enable the port. See the table on the right for jumper settings.

InfiniBand Port Enable/Disable Jumper Settings (J1B1)

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

5-11 Onboard Indicators

LAN1/LAN2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each Gb LAN port, one LED indicates activity when blinking while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

LAN LED (Connection Speed Indicator)	
LED Color	Definition
Off	10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

Onboard Power LED

DP4 is an Onboard Power LED. When this LED is lit, it means power is present on the serverboard. Be sure to turn off the system and unplug the power cord(s) before removing or installing components.

Onboard Power LED Indicator (LE1)	
LED Color	Definition
Green (Solid)	Power On, System On
Green (Flashing)	Power Standby: power cable connected, System: Off
Off	Power: Off, power cable: not connected

InfiniBand LED Indicators (LE2/ LE3)

Two InfiniBand LED indicators (LE2/ LE3) are located near the InfiniBand port. The green LED (LE2) is the InfiniBand Link LED while the yellow LED (LE3) indicates activity. Refer to the tables on the right for details.

InfiniBand Link LED (LE2)		
Color	Status	Definition
Green	Solid	InfiniBand Connected
Off	Off	No connection

InfiniBand Link LED (LE3)		
Color	Status	Definition
Yellow	Solid	InfiniBand: Active
Yellow	Dim	InfiniBand: Connected, Activity: Idle
Off	Off	No connection

5-12 Drive Connections

There are no IDE or floppy drive connectors on the motherboard. Use the following information to connect the SATA drive cables.

SATA Ports

There are no jumpers to configure the SATA ports, which are designated SATA0 through SATA3. See the table on the right for pin definitions.

SATA Ports Pin Definitions (SATA0-SATA3)

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC808TS-980 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows. The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Figure 6-1. Chassis Front View

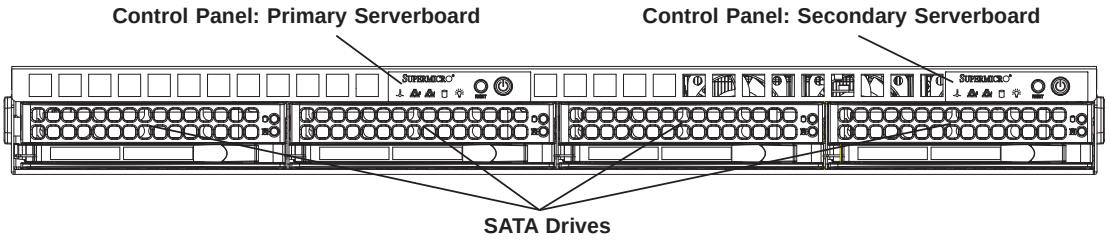
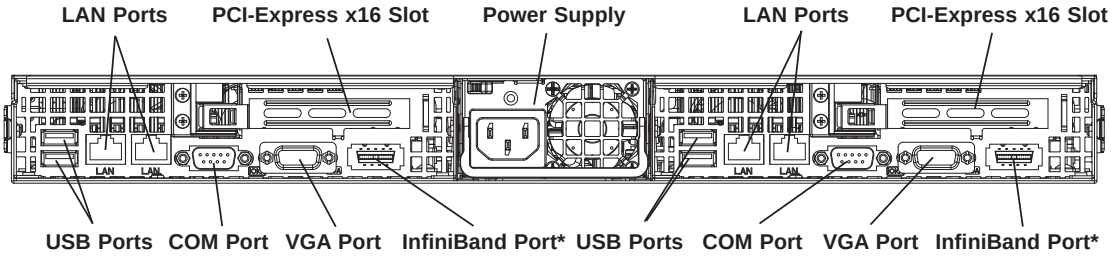


Figure 6-2. Chassis Rear View



*The 20 Gb InfiniBand ports are included on the 1021TM-INF+ only.

6-2 Control Panel

Each control panel on the front of the chassis must be connected to the JF1 connector on its assiciated serverboard to provide you with system control buttons and status indicators. (When viewed from the front of the chassis, the serverboard on the left is referred to as the primary serverboard and the serverboard on the right as the secondary.)

These wires have been bundled together in a ribbon cable to simplify the connection. Connect the cable from JF1 on the serverboard to the control panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path. The LEDs inform you of system status for the serverboard it is connected to. See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

6-3 System Fans

Each serverboard has its own set of three 4-cm high-performance fans (for a total of six in the chassis) to provide the cooling for the SuperServer 1021TM-T+/1021TM-INF+. Fan speed may be controlled by a setting in BIOS (see Chapter 7).

System Fan Failure

If a fan fails, the remaining fans will ramp up to full speed and the overheat/fan fail LED on the control panel will blink on and off. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the fans has failed. Then power down the system before replacing a fan. Removing the power cord is also recommended as a safety precaution.

Note: the fan fail LED will only give indication of a fan failure when the Fan Speed setting in the BIOS is set to "3-pin Server".

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

SATA Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace SATA drives. Proceed to the next step for instructions. **Note:** The operating system you use must have RAID support to enable the hot-swap capability of the SATA drives.

Use caution when working around the SATA backplane. Do not touch the backplane with any metal objects and make sure no cables touch the backplane. Also, regardless of how many SATA drives are installed, all four drive carriers must remain in the chassis to maintain proper airflow.

SATA Drive Installation

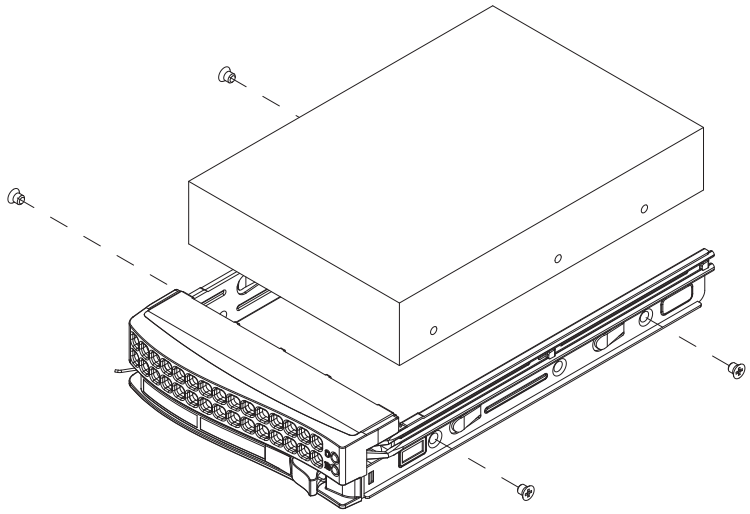
The SATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the system. For this reason, even empty carriers without drives installed must remain in the chassis.

Mounting a SATA Drive in a Carrier

1. Install the drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.

2. Secure the drive to the carrier with four screws, as shown in Figure 6-3.

Figure 6-3. Mounting a Drive in a Carrier

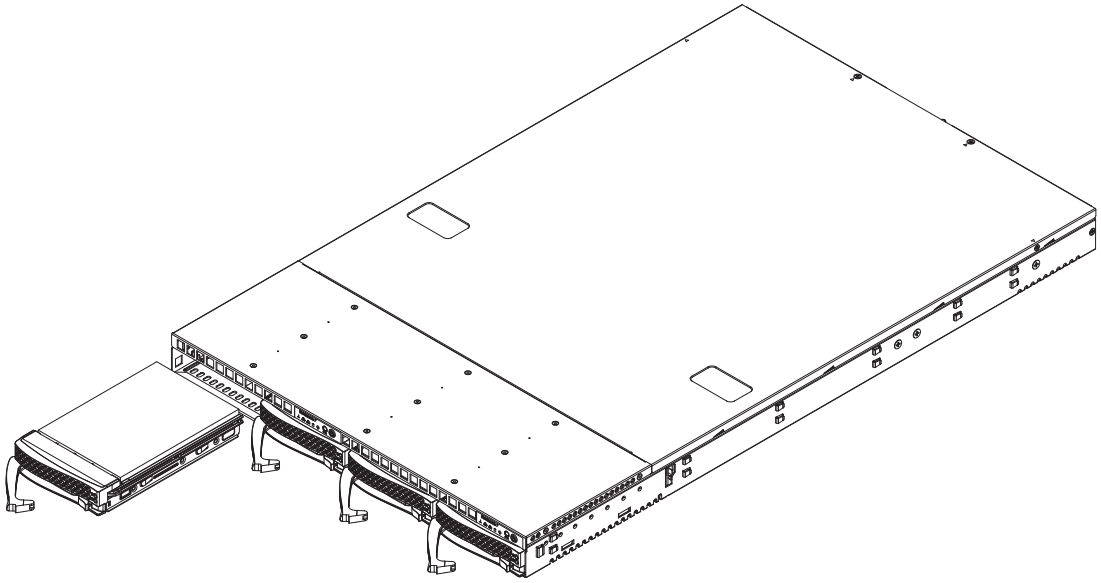


Installing/Removing Hot-swap SATA Drives

1. To remove a carrier, push the release button located beside the drive LEDs.

2. Swing the handle fully out and use it to pull the unit straight out (see Figure 6-4).

Figure 6-4. Removing a SATA Drive



6-5 Power Supply

The SuperServer 1021TM-T+/1021TM-INF+ has a single 980 watt power supply. This power supply has the capability of operating at 100 - 240 input volts. Depress both main power buttons on the front of the chassis and then unplug the AC power cord to completely remove power from the system before removing the power supply.

Power Supply Failure

If the power supply unit fails, the system will shut down and you will need to replace the power supply unit. Replacement units can be ordered directly from Supermicro (PWS-981-1S - see contact information in Chapter 1).

Replacing the Power Supply

Accessing the Inside of the System

1. Remove the top chassis cover by releasing the retention screws that secure the unit to the rack.

2. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").

3. The top cover of the chassis is secured with four screws: two at the top rear of the cover and one on each side lip, also near the back. Remove all four, then place both thumbs in the indentations and push the cover back until it slides off.

4. Lift the top cover from the chassis to gain full access to the inside of the server.

Removing the Power Supply

1. First unplug the power cord from the system.

2. To remove the failed power unit, remove the two screws on the back of the power supply, which secure it to the chassis.

3. Lift the unit straight out of the chassis. (See Figure 6-5.)

Installing a New Power Supply

1. Replace the failed unit with the exact same power supply model from Supermicro.

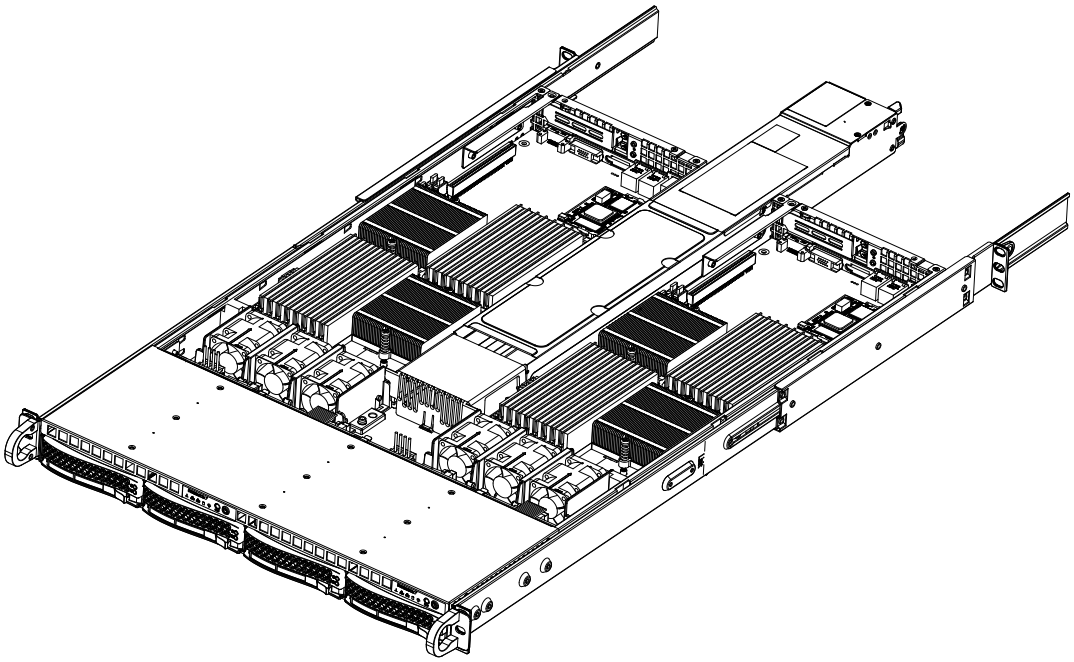
2. Carefully insert the new unit into position in the chassis and secure it with the two screws at the rear of the unit.

3. Before reconnecting the power cord, make sure the power switch on the power supply is in the off position.

4. Reconnect the power cord, replace the chassis top cover and push the unit back into the rack.

5. Finish by turning the power switch on the power supply on, and then depress the power buttons on the front of the chassis.

Figure 6-4. Removing the Power Supply



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the H8DMT+/H8DMT-INF+. The AMI ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of our web site for any changes to BIOS that may not be reflected in this manual.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.) Each main BIOS menu option is described in this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in **Bold** are the default values.

A "▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

7-2 Main Menu

When you first enter AMI BIOS Setup Utility, you will see the Main Menu screen. You can always return to the Main Menu by selecting the ***Main*** tab on the top of the screen with the arrow keys.

The Main Menu screen provides you with a system overview, which includes the version, built date and ID of the AMIBIOS, the type, speed and number of the processors in the system and the amount of memory installed in the system.

System Time/System Date

You can edit this field to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in DAY/MM/DD/YYYY format. The time is entered in HH:MM:SS format. Please note that time is in a 24-hour format. For example, 5:30 A.M. appears as 05:30:00 and 5:30 P.M. as 17:30:00.

7-3 Advanced Settings Menu

▶ BIOS Features

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for the system to boot up. The options are **Enabled** and Disabled.

Quiet Boot

If Disabled, normal POST messages will be displayed on boot-up. If **Enabled**, this display the OEM logo instead of POST messages.

OS Installation

Change this setting if using a 64-bit Linux operating system. The available options are **Other** and Linux.

Interrupt 19 Capture

Select Enabled to allow ROMs to trap Interrupt 19. The options are Enabled and **Disabled**.

Wait for F1 if Error

This setting controls the system response when an error is detected during the boot sequence. When enabled, BIOS will stop the boot sequence when an error is

detected, at which point you will need to press the F1 button to re-enter the BIOS setup menu. The options are **Enabled** and Disabled.

ACPI Mode

Use this setting to determine whether ACPI mode will be used. The options are **Yes** and No.

▶ Advanced ACPI Configuration

ACPI Version Features

Use this setting the determine which ACPI version to use. Options are **ACPI v1.0**, ACPI v2.0 and ACPI v3.0.

ACPI APIC Support

Determines whether to include the ACPI APIC table pointer in the RSDT pointer list. The available options are **Enabled** and Disabled.

ACPI OEMB Table

Determines whether to include the ACPI APIC table pointer in the RSDT pointer list. The available options are **Enabled** and Disabled.

Headless Mode

Use this setting to Enable or **Disable** headless operation mode through ACPI.

▶ General WHEA Configuration

WHEA Support

Use this setting to **Enable** or Disable WHEA (Windows Hardware Error Architecture) support. WHEA provides a common infrastructure for reporting hardware errors on Windows platforms and was designed to improve recovery following fatal hardware errors.

Power Button Mode

Allows the user to change the function of the power button. Options are **On/Off** and Suspend.

Watch Dog Timer Select

This setting is used to Enable or **Disable** the Watch Dog Timer function. It must be used in conjunction with the Watch Dog jumper (see Chapter 2 for details). To enable, choose from 1, 2, 3, 4, 8, 15 or 30 min.

Restore on AC Power Loss

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Power Off, Power On and **Last State**.

MPS Revision

This setting allows the user to select the MPS revision level. The options are 1.1 and **1.4.**

▶ SATA Configuration

Serial ATA Devices

This setting is used to determine if SATA drives will be used and how many. Options are Disabled, Device 0 and **Device 0/1**.

nVidia RAID Function

This setting is used to Enable or **Disable** the nVidia ROM. If Enabled, the setting below will appear.

SATA0/1 Primary/Secondary Channel

This setting is used to Enable or **Disable** the SATA0 Primary, SATA0 Secondary, SATA1 Primary and SATA1 Secondary, channels (four settings total). If enabled, the following settings will appear:

▶ SerialATA 0/1 Primary/Secondary Channel

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt. Select "Disabled" to allow the data to be transferred from and to the device one sector at a time. Select "Auto" to allows the data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4. Select Auto to allow BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 to allow BIOS to use PIO mode 0, which has a data transfer rate of 3.3 MBs. Select 1 to allow BIOS to use PIO mode 1, which has a data transfer rate of 5.2 MBs. Select 2 to allow BIOS to use PIO mode 2, which has a data transfer rate of 8.3 MBs. Select 3 to allow BIOS to use PIO mode 3, which has a data transfer rate of 11.1 MBs. Select 4 to allow BIOS to use PIO mode 4, which has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode

Selects the DMA Mode. Options are **Auto**, SWDMA0, SWDMA1, SWDMA2, MWDMA0. MDWDMA1, MWDMA2, UDMA0. UDMA1, UDMA2, UDMA3, UDMA4 and UDMA5. (SWDMA=Single Word DMA, MWDMA=Multi Word DMA, UDMA=UltraDMA.)

S.M.A.R.T.

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select "Auto" to allow BIOS to auto detect hard disk drive support. Select "Disabled" to prevent AMI BIOS from using the S.M.A.R.T. Select "Enabled" to allow AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32-Bit Data Transfer

Select "Enabled" to activate the function of 32-Bit data transfer. Select "Disabled" to deactivate the function. The options are **Enabled** and Disabled.

▶ PCI/PnP Configuration

Slot 1 OPROM

Use this setting to Enable or **Disable** the OPROM (Option ROM firmware) for slot 1. The options are **Yes** and No.

Load Onboard LAN Option ROM

Use this setting to Enable or **Disable** the onboard option ROM. This setting must be enabled to view the Boot Menu settings.

Clear NVRAM

Select Yes to clear NVRAM during boot-up. The options are Yes and **No**.

Plug & Play OS

Select Yes to allow the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow AMIBIOS to configure all devices in the system.

PCI Latency Timer

This option sets the latency of all PCI devices on the PCI bus. Select a value to set the PCI latency in PCI clock cycles. Options are 32, **64**, 96, 128, 160, 192, 224 and 248.

▶ Advanced Chipset Control

▶ NorthBridge Configuration

▶ Memory Configuration

Bank Interleaving

Select Auto to automatically enable a bank-interleaving memory scheme when this function is supported by the processor. The options are **Auto** and Disabled.

Channel Interleaving

Selects the channel-interleaving memory scheme when this function is supported by the processor. The options are Disabled, Address Bits 6, Address Bits 12, **XOR of Address Bits [20:16, 6]** and XOR of Address Bits [20:16, 9].

Enable Clock to All Dimms

Use this setting to enable unused clocks to all DIMMSs, even if some DIMM slots are unpopulated. Options are Enabled and **Disabled**.

Mem Clk Tristate C3/ALTVID

Use this setting to Enable or **Disable** memory clock tristate during C3 and ALT VID.

Memory Hole Remapping

When "Enabled", this feature enables hardware memory remapping around the memory hole. Options are **Enabled** and Disabled.

CS Sparing

This setting will reserve a spare memory rank in each node when enabled. Options are Enable and **Disable**.

DCT Unganged Mode

This setting enables unganged DRAM mode (64-bit). Options are Auto (ganged mode) and **Always** (unganged mode).

Power Down Enable

This setting enables or disables DDR power down mode. Options are **Enabled** and Disabled.

Power Down Mode

This sets the power down mode. Options are **Channel** and Chip Select.

8-DIMM Drive Strength

Use this setting to Enable or **Disable** 8-DIMM Drive Strength.

▶ ECC Configuration

ECC Mode

This setting affects the DRAM scrub rate based on its setting. Options are **Disabled,** Basic, Good, Super, Max and User.

DRAM ECC Enable

DRAM ECC allows hardware to report and correct memory errors automatically. Options are Enabled and **Disabled**.

DRAM Scrub Redirect

Allows system to correct DRAM ECC errors immediately, even with background scrubbing on. Options are Enabled and **Disabled**.

4-Bit ECC Mode

Allows the user to enabled 4-bit ECC mode (also known as ECC Chipkill). Options are Enabled and **Disabled**.

DRAM BG Scrub

Corrects memory errors so later reads are correct. Options are **Disabled** and various times in nanoseconds and microseconds.

Data Cache BG Scrub

Allows L1 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

L2 Cache BG Scrub

Allows L2 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

L3 Cache BG Scrub

Allows L3 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

▶ DRAM Timing Configuration

Memory Clock Mode

This setting specifies the memory clock mode. Options are **Auto**, Limit and Manual.

DRAM Timing Mode

This setting specifies the DRAM timing mode. Options are **Auto** and DCT.

▶ IOMMU Option Menu

IOMMU Mode

Used to disable or set the GART size in systems without AGP. Options are **AGP Present**, Disabled, 32 MB, 64 MB, 128 MB, 256 MB, 512 MB and 1 GB.

Alternate VID

Specify the alternate VID while in low power states. Options are **Auto** and various voltages from .800V to 1.050V in increments of .025V.

Memory Timing Parameters

Allows the user to select which CPU Node's timing parameters (memory clock, etc.) to display. Options are **CPU Node 0** and CPU Node1.

▶ SouthBridge/MCP55 Configuration

CPU/LDT Spread Spectrum

Enables spread spectrum for the CPU/LDT. Options are **Center Spread**, Down Spread or Disabled.

PCIE Spread Spectrum

Allows you to **Enable** or Disable spread spectrum for PCI-Express.

SATA Spread Spectrum

Enables spread spectrum for the SATA. Options are **Enabled** and Disabled.

USB 1.1 Controller

Allows you to **Enable** or Disable the USB 1.1 controller.

USB 2.0 Controller

Enable or Disable the USB 2.0 controller.

MAC0 LAN0

Settings are **Auto** and Disabled for MAC0 LAN0.

MAC0 LAN0 Bridge

Settings are **Enabled** and Disabled for MAC0 LAN0 bridge.

MAC1 LAN1

Settings are **Auto** and Disabled for MAC1 LAN1.

MAC1 LAN1 Bridge

Settings are **Enabled** and Disabled for MAC1 LAN1 bridge.

Legacy USB Support

Select "Enabled" to enable the support for USB Legacy. Disable Legacy support if there are no USB devices installed in the system. "Auto" disabled Legacy support if no USB devices are connected. The options are Disabled, **Enabled** and Auto.

▶ Processor & Clock Options

MTRR Mapping

This determines the method used for programming CPU MTRRs when 4 GB or more memory is present. The options are **Continuous**, which makes the PCI hole non-cacheable, and Discrete, which places the PCI hole below the 4 GB boundary.

Thermal Throttling

Used to Enable or **Disable** thermal to generate a power management event.

Power Now

This setting is used to Enable or **Disable** the AMD Power Now feature.

Secure Virtual Machine Mode

This setting is used to **Enable** or Disable SVM.

CPU Page Translation Table

This setting is used to **Enable** or Disable the CPU Page Translation Table.

▶ I/O Device Configuration

Serial Port1 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 1. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable. Select "3F8/IRQ4" to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options are Disabled, **3F8/IRQ4**, 3E8/IRQ4 and 2E8/IRQ3.

Serial Port2 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 2. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to "Disabled", the serial port physically becomes unavailable. Select "2F8/IRQ3" to allow the serial port to use 2F8 as its I/O port address and IRQ 3 for the interrupt address. The options are Disabled, **2F8/IRQ3**, 3E8/IRQ4 and 2E8/IRQ3.

▶ DMI Event Logging

View Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Mark All Events as Read

Highlight this item and press <Enter> to mark all events as read.

Clear Event Log

Select Yes and press <Enter> to clear all event logs. The options are Yes and No to verify.

▶ Console Redirection

Remote Access

Allows you to Enable or **Disable** remote access. If enabled, the settings below will appear.

Serial Port Number

Selects the serial port to use for console redirection. Options are **COM1** and COM2.

Serial Port Mode

Selects the serial port settings to use. Options are **(115200 8, n, 1)**, (57600 8, n, 1), (38400 8, n, 1), (19200 8, n, 1) and (09600 8, n, 1).

Flow Control

Selects the flow control to be used for console redirection. Options are **None,** Hardware and Software.

Redirection After BIOS POST

Options are Disable (no redirection after BIOS POST), Boot Loader (redirection during POST and during boot loader) and **Always** (redirection always active). Note that some OS's may not work with this set to Always.

Terminal Type

Selects the type of the target terminal. Options are **ANSI**, VT100 and VT-UTF8.

VT-UTF8 Combo Key Support

Allows you to **Enable** or Disable VT-UTF8 combination key support for ANSI/VT100 terminals.

Sredir Memory Display Delay

Use this setting to set the delay in seconds to display memory information. Options are **No Delay**, 1 sec, 2 secs and 4 secs.

▶ Hardware Health Monitor

CPU Overheat Alarm

Use the "+" and "-" keys to set the CPU temperature threshold to between 65° and 90° C. When this threshold is exceeded, the overheat LED on the chassis will light up and an alarm will sound. The LED and alarm will turn off once the CPU temperature has dropped to 5 degrees below the threshold set. The default setting is **72° C**.

▶ System Fan Monitor

Fan Speed Control

This feature allows the user to determine how the system will control the speed of the onboard fans. Select "Workstation" if your system is used as a Workstation. Select "Server" if your system is used as a Server. Select "Disable" to disable the fan speed control function to allow the onboard fans to continuously run at full speed (12V). The options are **1) Disable (Full Speed)** 2) 3-pin (Server) 3) 3-pin (Workstation).

FAN1 Speed through FAN8 Reading

The speeds of the onboard fans (in rpm) are displayed here.

Other items in the submenu are systems monitor displays for the following information:

CPU1 Temperature, CPU2 Temperature (for 2U systems), System Temperature, VCoreA, VCoreB (for 2U systems), HT Voltage, CPU1 Mem VTT, CPU2 Mem VTT, CPU1 Mem, CPU2 Mem, 12V, 3.3V, VDD, 5V VSB, MCP55VCore, 1.5V and VBAT.

▶ IPMI Configuration

▶ View BMC System Event Log

Pressing the Enter key will open the following settings. Use the "+" and "-" keys to navigate through the system event log.

Clear BMC System Event Log

Selecting this and pressing the Enter key will clear the BMC system event log.

▶ Set LAN Configuration

Use the "+" and "-" keys to choose the desired channel number.

▶ IP Address

Use the "+" and "-" keys to select the parameter. The IP address and current IP address in the BMC are shown.

▶ MAC Address

Use the "+" and "-" keys to select the parameter. The MAC address and current MAC address in the BMC are shown.

▶ Subnet Mask

Use the "+" and "-" keys to select the parameter. The subnet address and current subnet address in the BMC are shown.

▶ Set PEF Configuration

PEF Support

Use this setting to **Enable** or Disable PEF support. When enabled, the following settings will appear.

PEF Action Global Control

Options are **Alert**, Power Down, Reset Sysytem, Power Cycle, OEM Action and Diagnostic Int..

Alert Startup Delay

Use this setting to Enable or **Disable** the alert startup delay.

Startup Delay

Use this setting to Enable or **Disable** the startup delay.

Event Message for PEF Action

Use this setting to Enable or **Disable** event messages for a PEF action.

BMC Watch Dog Timer Action

This setting is used to set the Watch Dog function. The options are **Disabled**, Reset System, Power Down and Power Cycle.

7-4 Boot Menu

The Boot Menu is accessible only when the "Load Onboard LAN Option ROM" setting (in the PCI/PnP Configuration menu) is enabled.

▶ Boot Device Priority

This feature allows the user to prioritize the boot sequence from the available devices.

▶ Hard Disk Drives

This feature allows the user to specify the boot sequence from available hard disk drives.

7-5 Security Menu

AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

Change Supervisor Password

Select this option and press <Enter> to access the sub menu, and then type in the password.

Change User Password

Select this option and press <Enter> to access the sub menu, and then type in the password.

Boot Sector Virus Protection

This option is near the bottom of the Security Setup screen. Select "Disabled" to deactivate the Boot Sector Virus Protection. Select "Enabled" to enable boot sector protection. When "Enabled", AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

7-6 Exit Menu

Select the Exit tab from AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.

Save Changes and Exit

When you have completed the system configuration changes, select this option to leave BIOS Setup and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

Select this option to quit BIOS Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then Select "OK" to allow BIOS to automatically load the Optimal Defaults as the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not maximum performance.

Notes

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list (on the following page) correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

A-1 AMIBIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up.)
5 short, 1 long	Memory error	No memory detected in system
1 long, 8 short	Video error	Video adapter disabled or missing

Notes

Appendix B

BIOS POST Checkpoint Codes

When AMIBIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, diagnostic equipment can be attached to the computer to read I/O port 0080h.

B-1 Uncompressed Initialization Codes

The uncompressed initialization checkpoint codes are listed in order of execution:

Checkpoint	Code Description
D0h	The NMI is disabled. Power on delay is starting. Next, the initialization code checksum will be verified.
D1h	Initializing the DMA controller, performing the keyboard controller BAT test, starting memory refresh and entering 4 GB flat mode next.
D3h	Starting memory sizing next.
D4h	Returning to real mode. Executing any OEM patches and setting the Stack next.
D5h	Passing control to the uncompressed code in shadow RAM at E000:0000h. The initialization code is copied to segment 0 and control will be transferred to segment 0.

B-2 Bootblock Recovery Codes

The bootblock recovery checkpoint codes are listed in order of execution:

Checkpoint	Code Description
E0h	The onboard floppy controller if available is initialized. Next, beginning the base 512 KB memory test.
E1h	Initializing the interrupt vector table next.
E2h	Initializing the DMA and Interrupt controllers next.
E6h	Enabling the floppy drive controller and Timer IRQs. Enabling internal cache memory.
Edh	Initializing the floppy drive.
Eeh	Looking for a floppy diskette in drive A:. Reading the first sector of the diskette.
Efh	A read error occurred while reading the floppy drive in drive A:.
F0h	Next, searching for the AMIBOOT.ROM file in the root directory.
F1h	The AMIBOOT.ROM file is not in the root directory.
F2h	Next, reading and analyzing the floppy diskette FAT to find the clusters occupied by the AMIBOOT.ROM file.
F3h	Next, reading the AMIBOOT.ROM file, cluster by cluster.
F4h	The AMIBOOT.ROM file is not the correct size.
F5h	Next, disabling internal cache memory.
FBh	Next, detecting the type of flash ROM.
FCh	Next, erasing the flash ROM.
FDh	Next, programming the flash ROM.
FFh	Flash ROM programming was successful. Next, restarting the system BIOS.

B-3 Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution.

These codes are uncompressed in F0000h shadow RAM.

Checkpoint	Code Description
03h	The NMI is disabled. Next, checking for a soft reset or a power on condition.
05h	The BIOS stack has been built. Next, disabling cache memory.
06h	Uncompressing the POST code next.
07h	Next, initializing the CPU and the CPU data area.
08h	The CMOS checksum calculation is done next.
0Ah	The CMOS checksum calculation is done. Initializing the CMOS status register for date and time next.
0Bh	The CMOS status register is initialized. Next, performing any required initialization before the keyboard BAT command is issued.
0Ch	The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller.
0Eh	The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test.
0Fh	The initialization after the keyboard controller BAT command test is done. The keyboard command byte is written next.
10h	The keyboard controller command byte is written. Next, issuing the Pin 23 and 24 blocking and unblocking command.
11h	Next, checking if <End or <Ins> keys were pressed during power on. Initializing CMOS RAM if the Initialize CMOS RAM in every boot AMIBIOS POST option was set in AMIBCP or the <End> key was pressed.
12h	Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2.
13h	The video display has been disabled. Port B has been initialized. Next, initializing the chipset.
14h	The 8254 timer test will begin next.
19h	Next, programming the flash ROM.
1Ah	The memory refresh line is toggling. Checking the 15 second on/off time next.
2Bh	Passing control to the video ROM to perform any required configuration before the video ROM test.
2Ch	All necessary processing before passing control to the video ROM is done. Looking for the video ROM next and passing control to it.
2Dh	The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control
23h	Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors.
24h	The configuration required before interrupt vector initialization has completed. Interrupt vector initialization is about to begin.

Checkpoint	Code Description
25h	Interrupt vector initialization is done. Clearing the password if the POST DIAG switch is on.
27h	Any initialization before setting video mode will be done next.
28h	Initialization before setting the video mode is complete. Configuring the monochrome mode and color mode settings next.
2Ah	Bus initialization system, static, output devices will be done next, if present. See the last page for additional information.
2Eh	Completed post-video ROM test processing. If the EGA/VGA controller is not found, performing the display memory read/write test next.
2Fh	The EGA/VGA controller was not found. The display memory read/write test is about to begin.
30h	The display memory read/write test passed. Look for retrace checking next.
31h	The display memory read/write test or retrace checking failed. Performing the alternate display memory read/write test next.
32h	The alternate display memory read/write test passed. Looking for alternate display retrace checking next.
34h	Video display checking is over. Setting the display mode next.
37h	The display mode is set. Displaying the power on message next.
38h	Initializing the bus input, IPL, general devices next, if present. See the last page of this chapter for additional information.
39h	Displaying bus initialization error messages. See the last page of this chapter for additional information.
3Ah	The new cursor position has been read and saved. Displaying the Hit <DEL> message next.
3Bh	The Hit <DEL> message is displayed. The protected mode memory test is about to start.
40h	Preparing the descriptor tables next.
42h	The descriptor tables are prepared. Entering protected mode for the memory test next.
43h	Entered protected mode. Enabling interrupts for diagnostics mode next.
44h	Interrupts enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0 next.
45h	Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size next.
46h	The memory wraparound test is done. Memory size calculation has been done. Writing patterns to test memory next.
47h	The memory pattern has been written to extended memory. Writing patterns to the base 640 KB memory next.
48h	Patterns written in base memory. Determining the amount of memory below 1 MB next.
49h	The amount of memory below 1 MB has been found and verified.
4Bh	The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1 MB for the soft reset next. If this is a power on situation, going to checkpoint 4Eh next.

Checkpoint	Code Description
4Ch	The memory below 1 MB has been cleared via a soft reset. Clearing the memory above 1 MB next.
4Dh	The memory above 1 MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next.
4Eh	The memory test started, but not as the result of a soft reset. Displaying the first 64 KB memory size next.
4Fh	The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next.
50h	The memory below 1 MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing next.
51h	The memory size display was adjusted for relocation and shadowing.
52h	The memory above 1 MB has been tested and initialized. Saving the memory size information next.
53h	The memory size information and the CPU registers are saved. Entering real mode next.
54h	Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI next.
57h	The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing next.
58h	The memory size was adjusted for relocation and shadowing. Clearing the Hit <DEL> message next.
59h	The Hit <DEL> message is cleared. The <WAIT...> message is displayed. Starting the DMA and interrupt controller test next.
60h	The DMA page register test passed. Performing the DMA Controller 1 base register test next.
62h	The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next.
65h	The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
66h	Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next.
67h	Completed 8259 interrupt controller initialization.
7Fh	Extended NMI source enabling is in progress.
80h	The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next.
81h	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82h	The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next.
83h	The command byte was written and global data initialization has completed. Checking for a locked key next.
84h	Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next.
85h	The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS Setup next.

Checkpoint	Code Description
86h	The password was checked. Performing any required programming before WINBIOS Setup next.
87h	The programming before WINBIOS Setup has completed. Uncompressing the WINBIOS Setup code and executing the AMIBIOS Setup or WINBIOS Setup utility next.
88h	Returned from WINBIOS Setup and cleared the screen. Performing any necessary programming after WINBIOS Setup next.
89h	The programming after WINBIOS Setup has completed. Displaying the power on screen message next.
8Ch	Programming the WINBIOS Setup options next.
8Dh	The WINBIOS Setup options are programmed. Resetting the hard disk controller next.
8Fh	The hard disk controller has been reset. Configuring the floppy drive controller next.
91h	The floppy drive controller has been configured. Configuring the hard disk drive controller next.
95h	Initializing the bus option ROMs from C800 next. See the last page of this chapter for additional information.
96h	Initializing before passing control to the adaptor ROM at C800.
97h	Initialization before the C800 adaptor ROM gains control has completed. The adaptor ROM check is next.
98h	The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control.
99h	Any initialization required after the option ROM test has completed. Configuring the timer data area and printer base address next.
9Ah	Set the timer and printer base addresses. Setting the RS-232 base address next.
9Bh	Returned after setting the RS-232 base address. Performing any required initialization before the Coprocessor test next.
9Ch	Required initialization before the Coprocessor test is over. Initializing the Coprocessor next.
9Dh	Coprocessor initialized. Performing any required initialization after the Coprocessor test next.
9Eh	Initialization after the Coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID command next.
A2h	Displaying any soft errors next.
A3h	The soft error display has completed. Setting the keyboard typematic rate next.
A4h	The keyboard typematic rate is set. Programming the memory wait states next.
A5h	Memory wait state programming is over. Clearing the screen and enabling parity and the NMI next.
A7h	NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000 next.
A8h	Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next.

Checkpoint	Code Description
A9h	Returned from adaptor ROM at E000h control. Performing any initialization required after the E000 option ROM had control next.
Aah	Initialization after E000 option ROM control has completed. Displaying the system configuration next.
Abh	Uncompressing the DMI data and executing DMI POST initialization next.
B0h	The system configuration is displayed.
B1h	Copying any code to specific areas.
00h	Code copying to specific areas is done. Passing control to INT 19h boot loader next.

Notes

Appendix C

System Specifications

Note: unless noted specifications apply to a complete system (both serverboards).

Processors

Four AMD Opteron™ 2000 Series (Socket F) processors

Note: please refer to our website for details on supported processors.

Chipset

nVidia MCP55-V Pro

BIOS

AMI BIOS in 8 Mb Flash EEPROM (each serverboard)

Memory Capacity

Thirty two (32) DIMM slots to support a maximum up to 128 GB of DDR2-667/533/400 ECC registered SDRAM

Note: Refer to Section 5-6 before installing memory and our web site for recommended DIMMs.

Serial ATA Controller

On-chip controller to support four 3 Gb/s Serial ATA drives (RAID 0, 1)

SATA Drive Bays

Four (4) hot-swap drive bays to house four (4) standard SATA drives

PCI Expansion

Two (2) low-profile PCI-Express x16 slots (with pre-installed riser cards)

Serverboard

1021TM-T+: H8DMT+
1021TM-INF+: H8DMT-INF+
Dimensions (both): 6.5 x 16.4 in (165 x 417 mm)

Chassis

SC808TS-980 (1U Rackmount)

Dimensions: (WxHxD) 17.2 x 1.7 x 27.75 in. (437 x 43 x 705 mm)

Weight

Gross Weight: 40 lbs. (18.2 kg.)

System Cooling

Six (6) high performance 4-cm fans

System Input Requirements

AC Input Voltage: 100 - 240V AC auto-range
Rated Input Current: 14A - 6A max
Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 980W (Part# PWS-981-1S)
Rated Output Voltages: +12V (81A), +5Vsb (4A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions:
FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant
UL Listed (USA)
CUL Listed (Canada)
TUV Certified (Germany)
CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Note: please visit our web site for information on supported operating systems.

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Notes