

Intel® Entry Server Board SE7221BK1-E User Guide

Order Number: C72987-002

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Intel server boards contain a number of high-density VLSI and power delivery components that need adequate airflow for cooling. Intel's own chassis are designed and tested to meet the intended thermal requirements of these components when the fully integrated system is used together. It is the responsibility of the system integrator that chooses not to use Intel developed server building blocks to consult vendor datasheets and operating parameters to determine the amount of airflow required for their specific application and environmental conditions. Intel Corporation can not be held responsible if components fail or the server board does not operate correctly when used outside any of their published operating or non-operating limits.

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Preface

About This Manual

Thank you for purchasing and using the Intel® Entry Server Board SE7221BK1-E. This manual is written for system technicians who are responsible for troubleshooting, upgrading, and repairing this server board. This document provides a brief overview of the features of the board/chassis, a list of accessories or other components you may need, troubleshooting information, and instructions on how to add and replace components on the Intel® Entry Server Board SE7221BK1-E. For the latest version of this manual, refer to

<http://support.intel.com/support/motherboards/server/SE7221BK1-E>.

Manual Organization

Chapter 1 provides a brief overview of the Intel® Entry Server Board SE7221BK1-E. In this chapter, you will find a list of the server board features, photos of the product, and product diagrams to help you identify components and their locations.

Chapter 2 provides instructions on adding and replacing components. Use this chapter for step-by-step instructions and diagrams for installing or replacing components such as the memory, processor, the battery, and other components.

Chapter 3 provides instructions on using the utilities that are shipped with the board or that may be required to update the system. This includes how to navigate through the BIOS Setup screens, how to perform a BIOS update, and how to reset the password or CMOS. Information about the specific BIOS settings and screens is available in the Technical Product Specification. See <http://support.intel.com/support/motherboards/server/se7221bk1-e/spec.htm> for a link to the Technical Product Specification.

Chapter 4 provides troubleshooting information. In this chapter, you will find BIOS error messages and POST code messages. You will also find suggestions for performing troubleshooting activities to identify the source of a problem.

Product Accessories

This server board is compatible with the following Intel® Server Chassis:

Intel® Entry Server Platform SR1425BK1-E (Integrated 1U chassis and board)

Intel® Entry Server Chassis SC5250-E

You may need or want to purchase one or more of the following accessory items for your server:

Processor, memory DIMMs, hard drive, floppy drive, CDROM or DVDROM drive, operating system.

For information about which accessories, memory, processors, and third-party hardware have been tested and can be used with your board, and for ordering information for Intel products, see <http://support.intel.com/support/motherboards/server/SE7221BK1-E>

Additional Information and Software

If you need more information about this product or information about the accessories that can be used with this server board, go to this link to find the information below:

<http://support.intel.com/support/motherboards/server/SE7221BK1-E>

- In-depth technical information about this product, including the BIOS settings and chipset information in the *Intel® Entry Server Board SE7221BK1-E Technical Product Specification*.
- The latest product information
- Accessories or other Intel® server products
- Hardware (peripheral boards, adapter cards) and operating systems that have been tested with this product
- Chassis that have been tested with this product
- Processors that have been tested with this product
- DIMMs that have been tested with this product
- Power budget for this product
- Software to manage your Intel Server
- Diagnostics testing software
- Firmware and BIOS updates
- System drivers

- Safety Information



WARNING

Before working with your server product, whether you are using this guide or any other resource as a reference, pay close attention to the safety instructions. You must adhere to the assembly instructions in this guide to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL listing and other regulatory approvals of the product and will most likely result in noncompliance with product regulations in the region(s) in which the product is sold.

Emissions Disclaimer

To ensure EMC compliance with your local regional rules and regulations, the final configuration of your end system product may require additional EMC compliance testing. For more information please contact your local Intel Representative.

See the “[Regulatory and Integration Information](#)” for product safety compliance and EMC regulatory compliance information. This is an FCC Class A device. Integration of it into a Class B chassis does not result in a Class B device.

Intended Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (such as: medical, industrial, telecommunications, NEBS, residential, alarm systems, test equipment, etc.), other than an ITE application, may require further evaluation

EMC Testing

Before computer integration, make sure that the chassis, power supply, and other modules have passed EMC testing using a server board with a microprocessor from the same family (or higher) and operating at the same (or higher) speed as the microprocessor used on this server board.



WARNING

System power on/off: The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Electrostatic Discharge (ESD) and ESD Protection: ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist

strap attached to chassis ground—any unpainted metal surface—on your server when handling parts.

ESD and Handling Boards: Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available (not the board wrapper). Do not slide board over any surface.

Installing or Removing Jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool you use to remove a jumper, or you may bend or break the pins on the board.

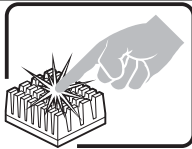
Safety Cautions

Read all caution and safety statements in this document before performing any of the instructions. See also *Intel Server Boards and Server Chassis Safety Information* on the Resource CD and/or at <http://support.intel.com/support/motherboards/server/sb/CS-010770.htm>.



SAFETY STEPS: Whenever you remove the chassis covers to access the inside of the system, follow these steps:

1. Turn off all peripheral devices connected to the system.
2. Turn off the system by pressing the power button.
3. Unplug all AC power cords from the system or from wall outlets.
4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system.
5. Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system—any unpainted metal surface—when handling components.
6. Do not operate the system with the chassis covers removed.



A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.

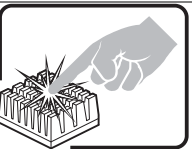
Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warn- und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und -Servergehäusen auf der Ressourcen-CD oder unter <http://support.intel.com/support/motherboards/server/sb/CS-010770.htm>.



SICHERHEISSMASSNAHMEN: Immer wenn Sie die Gehäuseabdeckung abnehmen um an das Systeminnere zu gelangen, sollten Sie folgende Schritte beachten:

1. Schalten Sie alle an Ihr System angeschlossenen Peripheriegeräte aus.
2. Schalten Sie das System mit dem Hauptschalter aus.
3. Ziehen Sie den Stromanschlußstecker Ihres Systems aus der Steckdose.
4. Auf der Rückseite des Systems beschrifteten und ziehen Sie alle Anschlußkabel von den I/O Anschlüssen oder Ports ab.
5. Tragen Sie ein geerdetes Antistatik Gelenkband, um elektrostatische Ladungen (ESD) über blanke Metallstellen bei der Handhabung der Komponenten zu vermeiden.
6. Schalten Sie das System niemals ohne ordnungsgemäß montiertes Gehäuse ein.



Der Mikroprozessor und der Kühler sind möglicherweise erhitzt, wenn das System in Betrieb ist. Außerdem können einige Platinen und Gehäuseteile scharfe Spitzen und Kanten aufweisen. Arbeiten an Platinen und Gehäuse sollten vorsichtig ausgeführt werden. Sie sollten Schutzhandschuhe tragen.

重要安全指

在行任何指令之前，本文档中的所有注意事及安全声明。参 Resource CD (源光) 和/或 <http://support.intel.com/support/motherboards/server/sb/CS-010770.htm> 上的 *Intel Server Boards and Server Chassis Safety Information* (《Intel 服务器主板与服务器机箱安全信息》)。

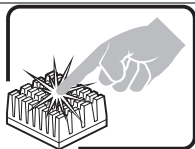
Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez *Intel Server Boards and Server Chassis Safety Information* sur le CD Resource CD ou bien rendez-vous sur le site <http://support.intel.com/support/motherboards/server/sb/CS-010770.htm>.



CONSIGNES DE SÉCURITÉ -Lorsque vous ouvrez le boîtier pour accéder à l'intérieur du système, suivez les consignes suivantes:

1. Mettez hors tension tous les périphériques connectés au système.
2. Mettez le système hors tension en mettant l'interrupteur général en position OFF (bouton-poussoir).
3. Débranchez tous les cordons d'alimentation c.a. du système et des prises murales.
4. Identifiez et débranchez tous les câbles reliés aux connecteurs d'E-S ou aux accès derrière le système.
5. Pour prévenir les décharges électrostatiques lorsque vous touchez aux composants, portez une bande antistatique pour poignet et reliez-la à la masse du système (toute surface métallique non peinte du boîtier).
6. Ne faites pas fonctionner le système tandis que le boîtier est ouvert.



Le microprocesseur et le dissipateur de chaleur peuvent être chauds si le système a été sous tension. Faites également attention aux broches aiguës des cartes et aux bords tranchants du capot. Nous vous recommandons l'usage de gants de protection.

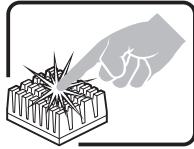
Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea *Intel Server Boards and Server Chassis Safety Information* en el CD Resource y/o en <http://support.intel.com/support/motherboards/server/sb/CS-010770.htm>.



INSTRUCCIONES DE SEGURIDAD: Cuando extraiga la tapa del chasis para acceder al interior del sistema, siga las siguientes instrucciones:

1. Apague todos los dispositivos periféricos conectados al sistema.
2. Apague el sistema presionando el interruptor encendido/apagado.
3. Desconecte todos los cables de alimentación CA del sistema o de las tomas de corriente alterna.
4. Identifique y desconecte todos los cables enchufados a los conectores E/S o a los puertos situados en la parte posterior del sistema.
5. Cuando manipule los componentes, es importante protegerse contra la descarga electrostática (ESD). Puede hacerlo si utiliza una muñequera antiestática sujeta a la toma de tierra del chasis — o a cualquier tipo de superficie de metal sin pintar.
6. No ponga en marcha el sistema si se han extraído las tapas del chasis.



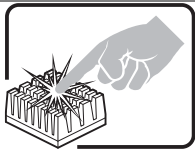
Si el sistema ha estado en funcionamiento, el microprocesador y el disipador de calor pueden estar aún calientes. También conviene tener en cuenta que en el chasis o en el tablero puede haber piezas cortantes o punzantes. Por ello, se recomienda precaución y el uso de guantes protectores.

AVVERTENZA: Italiano



PASSI DI SICUREZZA: Qualora si rimuovano le coperture del telaio per accedere all'interno del sistema, seguire i seguenti passi:

1. Spegner tutti i dispositivi periferici collegati al sistema.
2. Spegner il sistema, usando il pulsante spento/accesso dell'interruttore del sistema.
3. Togliere tutte le spine dei cavi del sistema dalle prese elettriche.
4. Identificare e sconnettere tutti i cavi attaccati ai collegamenti I/O od alle prese installate sul retro del sistema.
5. Qualora si tocchino i componenti, proteggersi dallo scarico elettrostatico (SES), portando un cinghia anti-statica da polso che è attaccata alla presa a terra del telaio del sistema – qualsiasi superficie non dipinta – .
6. Non far operare il sistema quando il telaio è senza le coperture.



Se il sistema è stato a lungo in funzione, il microprocessore e il dissipatore di calore potrebbero essere surriscaldati. Fare attenzione alla presenza di piedini appuntiti e parti taglienti sulle schede e sul telaio. È consigliabile l'uso di guanti di protezione.

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1 Server Board Features

This chapter briefly describes the main features of Intel® Entry Server Board SE7221BK1-E. This chapter provides a photograph of the product, a list of the server board features, and diagrams showing the location of important components and connections on the server board. This server board is available in three options:

- The Intel® Entry Server Board SE7221BK1-E includes Serial ATA host controller for 4 ports with support for RAID 0, 1, and 10 provided. It also includes dual-channel Parallel ATA support and an on-board Intel® 82541PI Ethernet Controller.
- The Intel® Entry Server Board SE7221BK1-E (LX SKU) adds a second Intel® 82541PI Ethernet Controller, Intel® Adaptive Slot technology, additional fan headers, and LED diagnostics.
- The Intel® Entry Server Platform SR1425BK1-E based on the Intel® Server Chassis SR1400 and the Intel® Entry Server Board SE7221BK1-E (LX SKU).

The Intel® Server Board SE7221BK1-E with second NIC and Adaptive Slot is shown.

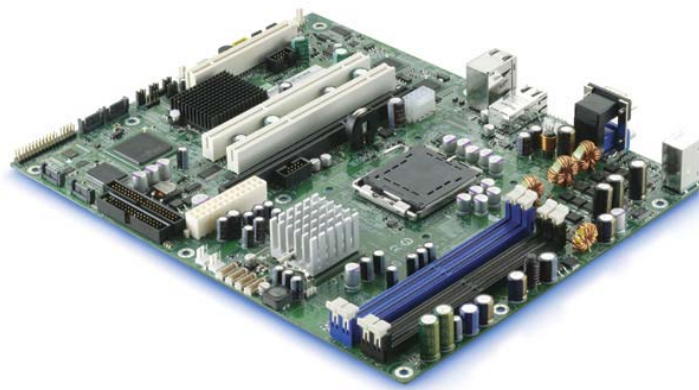


Figure 1. Intel® Server Board SE7221BK1-E

Table 1. Server Board Features

Feature	Description
Processors	Support for an Intel® Pentium® 4 processor with Intel® Hyper-Threading Technology in an LGA775 package with an 800 MHz system bus. Frequencies starting at 2.8 GHz
Memory	<ul style="list-style-type: none"> ▪ Four DDR2 SDRAM Dual Inline Memory Module (DIMM) sockets ▪ Support for 256MB to 4 GB Unbuffered ECC on Non-ECC DDR2 400/533 system memory ▪ Support for single-sided or double-sided DIMMs (DDR2 400/533) <ul style="list-style-type: none"> - To run DDR2 400 MHz memory at full speed requires an Intel® Pentium® 4 processor with 800 MHz system bus frequency. - DIMMs must be ECC x8 or Non-ECC x8 or x16 DDR2 unbuffered. - Supports Intel x4 SDDC only with x4 DIMMS
Chipset	Intel® E7221 chipset, consisting of: <ul style="list-style-type: none"> ▪ Intel® E7221 Memory Controller Hub (GMCH) ▪ Intel® ICH6R I/O Controller Hub ▪ Intel® PXH PCI-X Hub ▪ National Semiconductor* PC87431M mini-Baseboard Management Controller
I/O Control	National Semiconductor* PC87427 Super I/O controller chip
Peripheral Interfaces	<ul style="list-style-type: none"> ▪ Two external USB 2.0 ports on the back panel with an additional internal header, which provides support for two additional USB ports with front panel support (four total possible USB 2.0 ports) ▪ One external serial port and one serial header ▪ One 40 pin ATA-100 IDE connector ▪ An integrated Serial ATA controller with 4 serial ports output. Support for Raid 0, 1, and 10 ▪ One standard 34 pin front panel connector supporting floppy drive interface with support for one drive, for use with or without backplane ▪ PS/2* keyboard and mouse ports
LAN	<ul style="list-style-type: none"> ▪ One Intel® 82541PI Ethernet Controller Platform LAN Connect (PLC) device for 10/100/1000 Mb/s Ethernet LAN connectivity ▪ Intel® Entry Server Board SE7221BK1-E (LX and SR SKUs only) Additional Intel® 82547EI Platform LAN Connect (PLC) device for 10/100/1000 Mbps Ethernet LAN connectivity
Expansion Capabilities	Four independent PCI buses <ol style="list-style-type: none"> 1. One PCI 2.3 32-bit/33 MHz, 5 V connector supporting full length PCI add-in cards and one 82541PI Gigabit Ethernet Controller 2. A second 32-bit/33 MHz 82541PI Gigabit Ethernet Controller (Intel® Entry Server Board SE7221BK1-E (LX and SR SKUs only)) 3. Two PCI-X 64 bit 3.3 volt slots which can support either: <ul style="list-style-type: none"> ▪ Two full length PCI / PCI-X add-in cards at 66 MHz or ▪ One PCI-X 64-bit/100 MHz, 3.3 V card 4. One x8 PCI-Express* slot supporting x1, 2, x4 or x8 (SC5250E) or One riser card supporting PCI, PCI-X or PCI-Express* add-in card (SR1425BK1-E)
Integrated Graphics	Integrated graphics supporting SVGA
Fans	Support for up to four system fan modules and one processor fan

Feature	Description
BIOS	Intel/AMI BIOS with support for: <ul style="list-style-type: none">▪ Advanced Configuration and Power Interface (ACPI)▪ 8 megabit symmetrical flash memory▪ Support for SMBIOS
Power Management	Support for ACPI: <ul style="list-style-type: none">▪ Support for S0, S1, S4, and S5▪ Wake on USB, PCI, RS-232, PS/2, LAN, and front panel
Server Management	Intel® Server Management support via National Semiconductor* mini-Baseboard Management Controller (mBMC)

Connector and Component Locations

The connections you make depend on the chassis and the components you are installing.

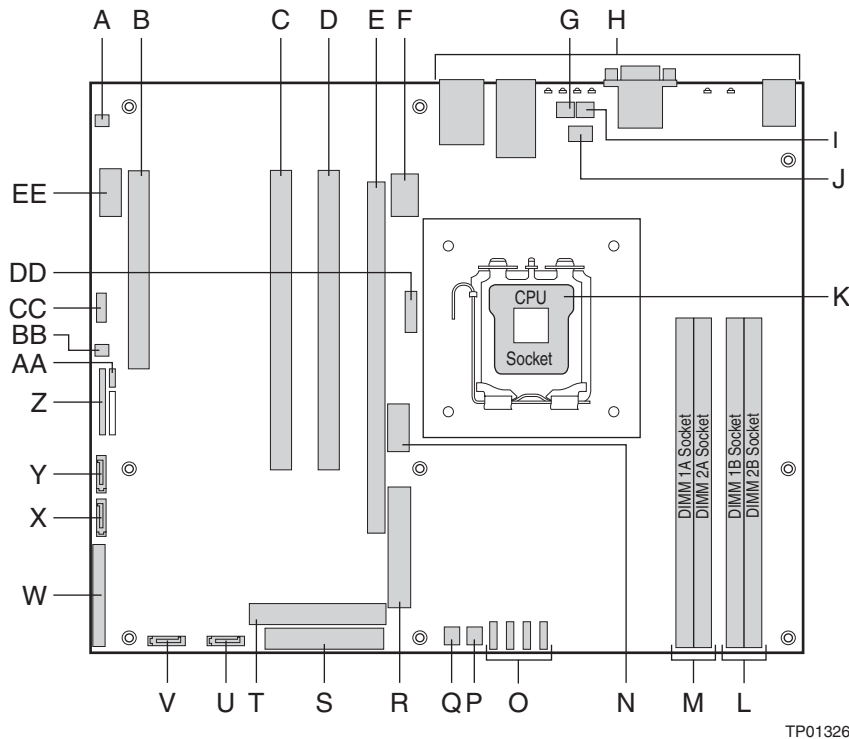


Figure 2. Intel® Entry Server Board SE7221BK1-E Connections

A Chassis Intrusion Header	M DIMM Sockets (two – from left to right: DIMM 1A, DIMM 2A)	W 34-pin Front Panel Connector
B PCI Slot	N Front USB Header (optional)	X Serial ATA (SATA) 2 Connector
C PCI-X 100 SLOT	O System Fan Headers (for Intel® Server Board SR1425BK1-E)	Y SATA 1 Connector
D PCI-X 100 SLOT	P System Fan #4	Z BIOS Control Jumper
E PCI-Express* or Riser Connector Slot	Q System Fan #3 (optional)	AA BIOS Select Jumper
F +12v CPU Power	R Main Power Connector	BB HDD LED Header
G System Fan #1 (optional)	S Floppy Connector	CC HSBP Header
H Back Panel I/O Connectors	T IDE Connector	DD Battery
I System Fan #2 (optional)	U SATA 4 Connector	EE Serial B Header
J CPU Fan (optional)	V SATA 3 Connector	
K CPU Socket		
L DIMM Sockets (two – from left to right: DIMM 1B, DIMM 2B)		

Configuration Jumpers

System Recovery and Update

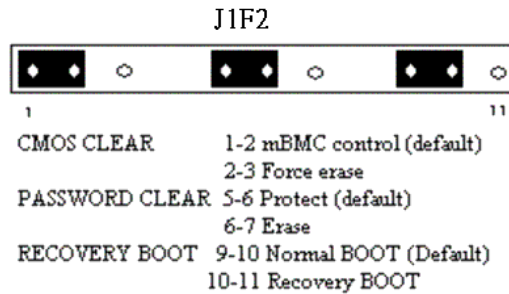


Figure 3. Configuration Jumper Location (J1F2)

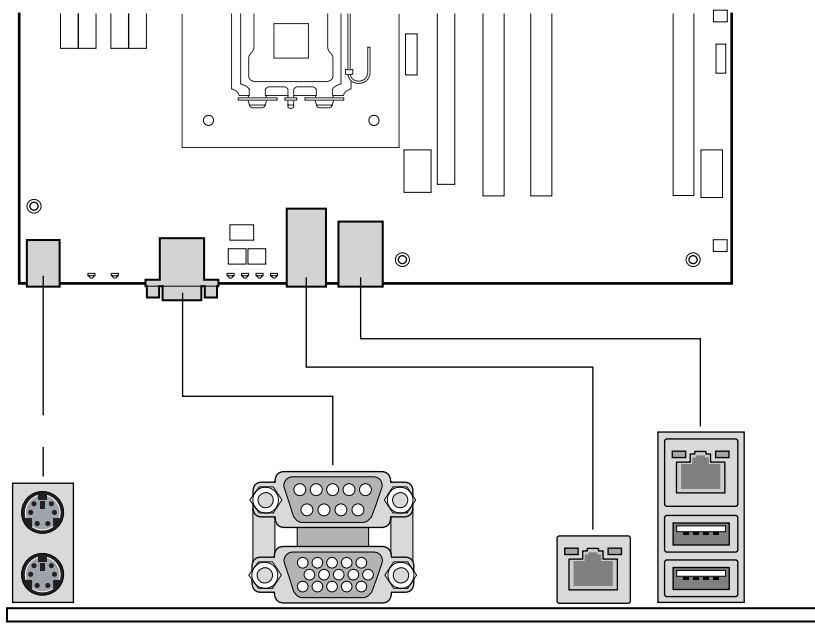
NOTE

Pin 1 is close to the SATA Header. This view is from the CPU side insert.

Table 2. Configuration Jumper [J1F2]

Function	Pin – Pin	Function	Description
CMOS CLEAR	1-2	<i>mBMC control</i>	CMOS settings will be cleared on the next reset.
	2-3	Force erase	Normal operation – Jumper 1-2
PASSWORD CLEAR	5-6	<i>Protect</i>	Administrator and user passwords will be cleared on the next reset.
	6-7	Erase	Normal operation – Jumper 5-6
RECOVERY BOOT	9-10	<i>Normal BOOT</i>	BIOS recovery can be attempted by loading BIOS code into flash device from a floppy.
	10-11	Recovery BOOT	

Back Panel Connectors



TP01330

Figure 4. Back Panel Connectors

The NIC LEDs at the right and left of each NIC provide the following information.

Table 3. NIC LEDs

NIC	LED Color	LED State	Description
NIC1 Gigabit	Left LED	Off	No network connection
		Solid Green	Network connection in place
		Blinking Green	Transmit/receive activity
	Right LED	Off	10 Mbps connection (if left LED is on or blinking)
		Solid Green	100 Mbps connection
		Solid Amber	1000 Mbps connection
NIC 2 Gigabit (Optional)	Left LED	Off	No network connection
		Solid Green	Network connection in place
		Blinking Green	Transmit/receive activity
	Right LED	Off	10 Mbps connection (if left LED is on or blinking)
		Solid Green	100 Mbps connection
		Solid Amber	1000 Mbps connection

Hardware Requirements

To avoid integration difficulties and possible board damage, your system must meet the requirements outlined below. For a list of qualified components see the links under <http://www.support.intel.com/support/motherboards/server/SE7221BK1-E>.

Processor

One 2.8 GHz or greater Intel® Pentium® 4 processor in an LGA775 package for an 800 MHz system bus. For a complete list of supported processors, see the links under <http://www.support.intel.com/support/motherboards/server/SE7221BK1-E>.

Memory

One to four DIMMs

Unbuffered DDR2 400/533 MHz

ECC or non-ECC (ECC will be disabled if any non-ECC DIMMs are used)

256MB to 1GB DIMMs

Should support Serial Presence Detect (SPD) data structure. This allows the BIOS to read the SPD data and program the chipset to accurately configure memory settings for optimum performance. If non-SPD memory is installed, the BIOS will attempt to correctly configure the memory settings, but performance and reliability may be impacted or the DIMMs may not function under the determined frequency.

For a complete list of supported memory DIMMs, see the links under <http://support.intel.com/support/motherboards/server/SE7221BK1-E>.

Power Supply

The Power Supply must be a minimum of 450 Watts. Suggested connectors include:

- 2x12 for Main Power Connector
- 2x2 (yellow/black) wires in a 2x4 connector for +12v auxiliary power to Processor
- Split 12v rails to SATA
- Standard IDE 4 wire connector

Table 4. Board Power Supply Voltage Specification

PARAM	TOLERANCE	MIN	NOM	MAX	UNITS
+ 3.3V	- 5% / +5%	+3.14	+3.30	+3.46	V _{rms}
+ 5V	- 5% / +5%	+4.75	+5.00	+5.25	V _{rms}
+ 12V	- 5% / +5%	+11.40	+12.00	+12.60	V _{rms}
- 12V	- 10% / +10%	-11.40	-12.00	-13.08	V _{rms}
+ 5VSB	- 5% / +5%	+4.75	+5.00	+5.25	V _{rms}

PCI Buses

There are four independent PCI bus segments (dependent on model). The PCI buses comply with the *PCI Local Bus Specification, Rev 2.3*.

- P32-A supports Slot 1 and NIC 1 on a 32-bit/33 MHz bus routed from the ICH6R.
- P32-B supports the optional second NIC routed through the PXH.
- P64-C supports two PCI-X slots routed through the PXH. In some models PC64-C will instead support the riser slot if used for PCI-X.
- x8 PCI-Express* is available (optional) from the Intel® Adaptive Slot technology slot and routed from the MCH.
- The Adaptive Slot is only available on Intel® Entry Server Board SE7221BK1-E (LX SKU) and the Intel® Entry Server Platform SR1425BK1-E.

Table 5. PCI Buses

PCI Bus Segment	Voltage	Width	Speed	Type	PCI I/O Card Slots
SC5250-E Pedestal Chassis					
PCI	5V	32 bits	33 MHz	P32-A	Slot 1
PCI-X	3.3V	64 bits	100 MHz	P64-C	Slot 4 ; Slot 5,
PCI-E (x8)	3.3	8 lanes	100 MHz		Slot 6
SR1425BK1-E Rack Chassis					
PCI-E (x8)	3.3	8 lanes	100 MHz		Adaptive Riser Slot
PCI-X	3.3V	64 bits	66 MHz		Adaptive Riser Slot

Riser Options

Peripherals and add-in cards are not included in your system and must be purchased separately.

For 1U models, you must use the 90° riser option to add in PCI, PCI-X or PCI-Express* adapters. The 64-bit (white) slots cannot be used for 1u or if a 90° riser card is installed. Riser cards for the Intel® Entry Server Board SE7221BK1-E are custom fit and provide either PCI 2.3 or PCI-Express* capability. Please see the available accessories list at <http://support.intel.com/support/motherboards/server/SE7221BK1-E>.

2 Hardware Installations and Upgrades

Before You Begin

Before working with your server product, pay close attention to the Safety Information at the beginning of this manual.

Tools and Supplies Needed

Phillips* (cross head) screwdriver (#1 bit and #2 bit)

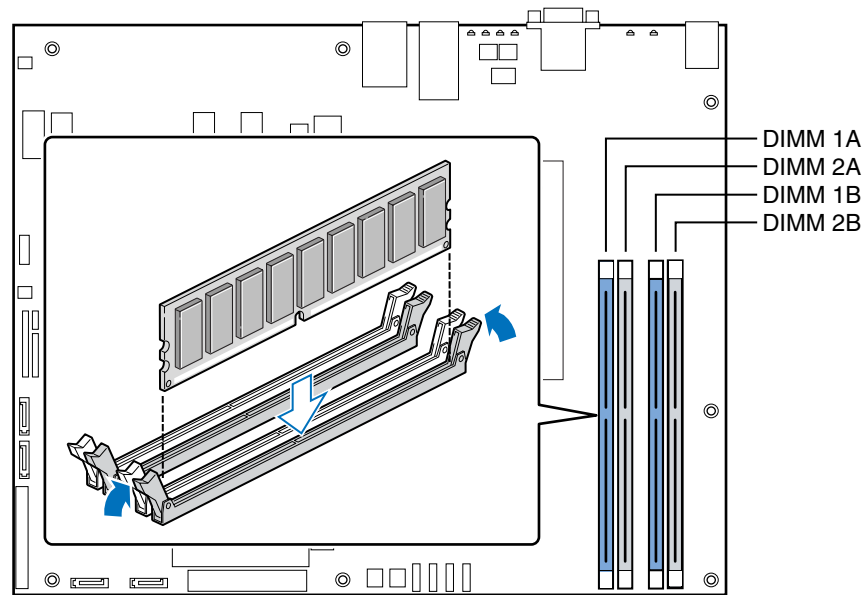
Flat head screwdriver

Needle nosed pliers

Antistatic wrist strap and conductive foam pad (recommended)

Gloves to avoid sharp edges (recommended)

Installing and Removing Memory



TP01327

Figure 5. DIMM Install

Installing DIMMs

Note: You must use DDR2 DIMMs.

1. Observe the safety and ESD precautions at the beginning of this user guide.
2. Turn off all peripheral devices connected to the server.
3. Turn off the server.
4. Disconnect the AC power cord.
5. Remove the chassis cover and locate the DIMM sockets.
6. Make sure the clips at either end of the DIMM socket(s) are pushed outward to the open position.
7. Holding the DIMM by the edges, remove it from its anti-static package.
8. Position the DIMM above the socket. Align the small notch in the bottom edge of the DIMM with the keys in the socket (see inset in Figure).
9. Insert the bottom edge of the DIMM into the socket.
10. When the DIMM is inserted, push down on the top edge of the DIMM until the retaining clips snap into place. Make sure the clips are firmly in place.
11. Replace the server's cover and reconnect the AC power cord.

Note: Populate in this order: 1A, 1B, 2A, 2B. Match DIMMs in the same Channel.

Removing DIMMs

To remove a DIMM, follow these steps:

1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Remove the AC power cord from the server.
4. Remove the server's cover.
5. Gently spread the retaining clips at each end of the socket. The DIMM pops out of the socket.
6. Hold the DIMM by the edges, lift it away from the socket, and store it in an anti-static package.
7. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.
8. Replace the server cover and reconnect the AC power cord.

Installing or Replacing the Processor

Also see <http://support.intel.com/support/processors/pentium4/sb/CS-012311.htm>.



CAUTIONS

Processor must be appropriate: You may damage the server board if you install a processor that is inappropriate for your server. See <http://support.intel.com/support/motherboards/server/SE7221BK1-E> for a link to the list of compatible processors.

IMPORTANT: Do not touch the gold contacts on the CPU or the socket!

ESD and handling processors:

Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following:

1. Touch the metal chassis before touching the processor or server board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor.
2. Avoid moving around unnecessarily.

Installing the Processor

To install a processor, follow these instructions:

Observe the safety and ESD precautions previously listed. Please refer to matching visuals on next page.

- A. Locate the processor socket
- B. Raise the socket handle completely
- C. Using fingertip on back prong,
- D. Raise the socket cover
- E. Remove the processor from package
 - i. Hold only by edges
 - ii. Do NOT touch gold contacts
- F. Locate the triangular shape on the pin 1 corner of the processor and line up to the alignment key
- G. Insert the processor into the socket. It should drop into the socket without any force
- H. The CPU socket is shipped with a protective Pick and Place Cover
Use both hands to remove the Plastic Cap
Keep the cover to protect the socket if the processor is removed
- I. Close the socket handle completely to lock in the processor

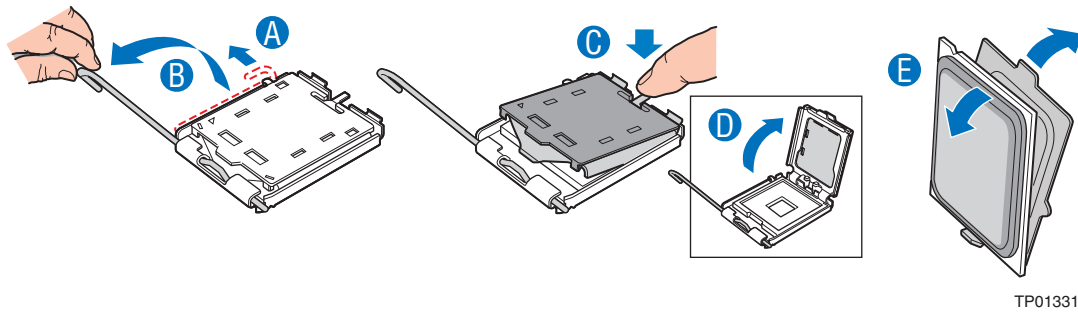


Figure 6. Processor Install

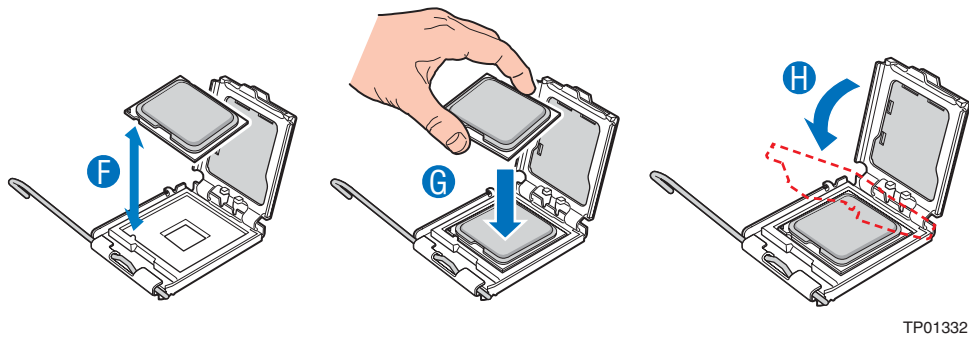


Figure 7. Installing the Processor in the Processor Socket

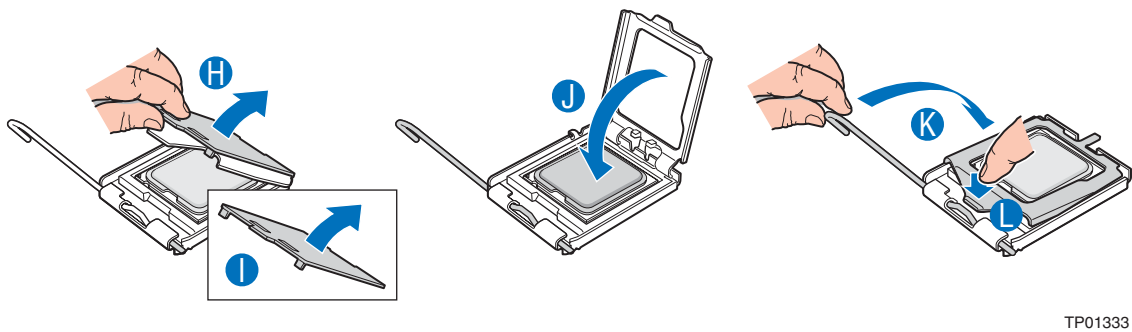


Figure 8. Processor Install

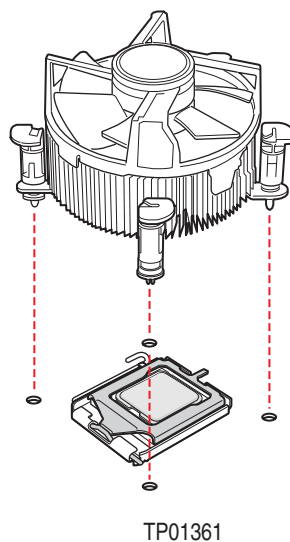


Figure 9. Attaching the Heat Sink to the Processor

- I. Install the heatsink onto the processor.
 - i. Use one's thumb and turn connector quarter turn to lock in.

The bottom of the heat sink has thermal interface material (TIM) already applied. Be careful not to damage the thermal interface material. Platform models must use an active heat sink with fan.

Note: SR1425BK1-E models come with a custom copper 1u passive heat sink. Solid areas go on the left and the right (not the front and back of the processor).

If TIM is covered by a protective sheet, remove the sheet.

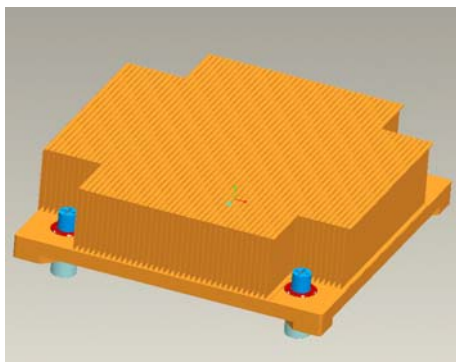
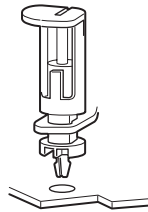


Figure 10. Heat Sink

Removing the Processor

To remove the processor, follow these instructions:

1. Observe the safety and ESD precautions previously listed.
2. Use a flat blade screwdriver to turn each connector 1/4 turn so it pops out of the server board. Lift firmly since TIM may create some "stickiness" between heat sink and processor.
3. Lift the heat sink from the processor.
4. Lift the processor lever.
5. Remove the processor. Hold it by the edges only.
6. Return the processor cover to the processor and the PnP to the socket while not in use.



TP01360

Figure 11. Heat Sink Snap

Installing a PCI, PCI-X, or PCI-Express* Card

Peripherals and add-in cards are not included in your system and must be purchased separately. The process for adding PCI adapters is dependant upon the chassis configuration (pedestal or rack mount).

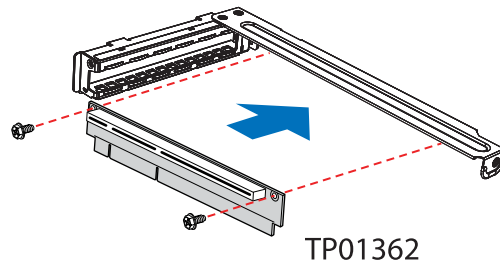


Figure 12. Add-in Riser

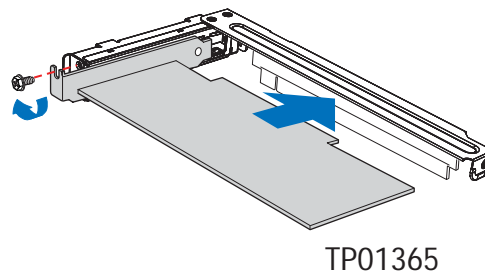


Figure 13. Add-in Card

Pedestal chassis add-in procedure

In the pedestal configuration, the PCI slots support add-in cards with full height brackets.

1. Remove the screw that fastens the PCI bracket to the rear of the chassis. Retain the screw.
2. Insert the PCI card into the PCI slot. (Keep the add-in card level during insertion. Tilting it during installation may damage the card or the slot).
3. Use the screw removed in step 1 to secure the PCI card to the chassis.

Rack-mount chassis add-in procedure

The PCI Riser Bracket Assembly fits tightly against power connections on the server board. Be very careful not to pinch or damage the electrical connections when installing and removing the Bracket Assembly.

1. Remove the riser bracket.
2. Attach the riser connector to the bracket with the 2 screws accompanying the chassis.
3. Insert the add-in PCI card into the riser connector. Tilting card while forcing into riser will damage the add-in card.
4. Use the 3rd screw to connect the add-in card's bracket to the main bracket assembly.
5. Install the bracket assembly aligning the I/O edge with the slots in the back of the chassis and the riser card into the server board adaptive slot.
6. Push down firmly but carefully.

Replacing the Backup Battery

The lithium battery on the server board powers the RTC for up to ten years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.



WARNING

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.



ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.



ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.



WARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

**VAROITUS**

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

1. Observe the safety and ESD precautions at the beginning of this book.
2. Turn off all peripheral devices connected to the server. Turn off the server.
3. Disconnect the AC power cord from the server.
4. Remove the server's cover and locate the battery. It stands upright next to the processor.
5. Insert the tip of a small flat bladed screwdriver, or an equivalent, under the tab in the plastic retainer. Gently push down on the screwdriver to lift the battery.
6. Remove the battery from its socket.
7. Dispose of the battery according to local ordinance.
8. Remove the new lithium battery from its package, and being careful to observe the correct polarity, insert it in the battery socket.
9. Close the chassis.
10. Run the Setup to restore the configuration settings to the RTC.

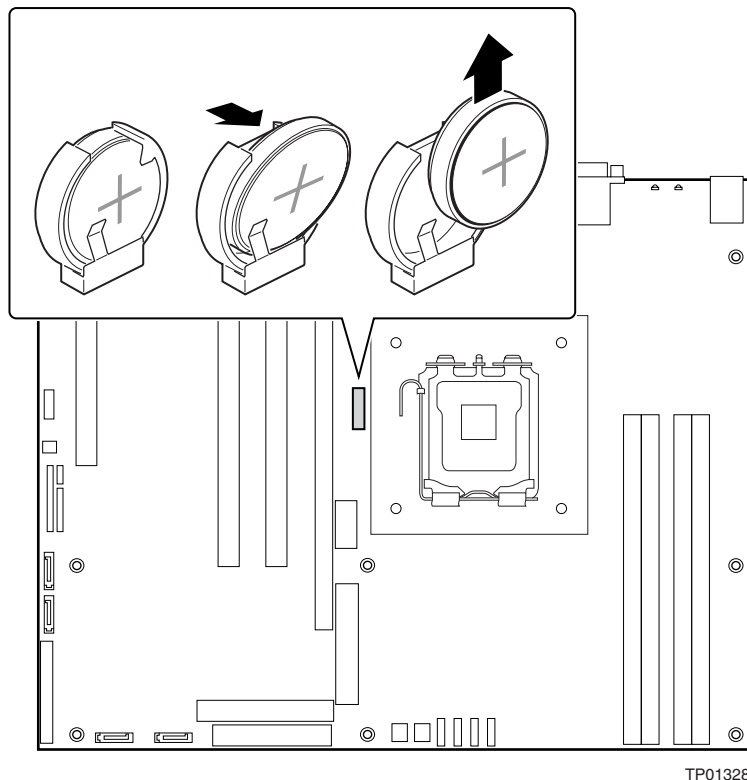


Figure 14. Replacing the Battery

3 Server Utilities

BIOS Setup

The BIOS Setup utility is provided to perform system configuration changes and to display current settings and environment information.

The BIOS Setup utility stores configuration settings in the system's non-volatile memory. Changes affected by the BIOS Setup will not take effect until the system is rebooted. The BIOS Setup Utility can be accessed when prompted during POST by using the F2 key.

Localization

The BIOS Setup utility uses the Unicode standard and is capable of displaying setup forms in English, French, Italian, German, and Spanish. The BIOS supports these languages for console strings as well.

Console Redirection

The BIOS Setup is functional via console redirection over various terminal emulation standards. Due to emulation compatibility reasons, some functionality may be limited, e.g., usage of colors, some keys and/or key sequences, and support of some pointing devices.

Configuration Reset

There are different mechanisms for resetting the system configuration to default values. When a reset system configuration request is detected, the BIOS will load the default system configuration values during the next POST.

A reset system configuration request can be generated by moving the Clear CMOS jumper.

Keyboard Commands

The Keyboard Command Bar supports the following keys:

Table 6. BIOS Setup Keyboard Command Bar Options

Key	Option	Description
Enter	Execute Command	The Enter key is used to activate choices. If a pick list is displayed, the Enter key will undo the pick list, and allow another selection in the parent menu.
ESC	Exit	When the ESC key is pressed in any sub-menu, the parent menu is re-entered. When the ESC key is pressed in any parent menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded. If “No” is selected and the Enter key is pressed, or if the ESC key is pressed, the user is returned to where they were before ESC was pressed without affecting any existing any settings. If “Yes” is selected and the Enter key is pressed, setup is exited and the BIOS continues with POST.
↑	Select Item	The up arrow is used to select the previous value in a pick list, or the previous options in a menu item's option list. Select then press enter.
↓	Select Item	The down arrow is used to select the next value in a menu item's option list, or a value field's pick list. The selected item must then be activated by pressing the Enter key.
←→	Select Menu	The left and right arrow keys are used to move between the major menu pages. The keys have no affect if a sub-menu or pick list is displayed.
Tab	Select Field	The Tab key is used to move between fields. For example, Tab can be used to move from hours to minutes in the time item in the main menu.
-	Change Value	The minus key on the keypad is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
+	Change Value	The plus key on the keypad is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboard, but will have the same effect.
F9	Setup Defaults	Pressing F9 causes the following to appear: Load Setup Defaults? [OK] [Cancel] If “OK” is selected and the Enter key is pressed, all setup fields are set to their default values. If “Cancel” is selected and the Enter key is pressed, or if the ESC key is pressed, the user is returned to where they were before F9 was pressed without affecting any existing field values.
F7	Discard Changes	Pressing F7 causes the following message to appear: Discard Changes? [OK] [Cancel] If “OK” is selected and the Enter key is pressed, all changes are not saved and setup is exited. If “Cancel” is selected and the Enter key is pressed, or the ESC key is pressed, the user is returned to where they were before F7 was pressed without affecting any existing values.

Key	Option	Description
F10	Save Changes and Exit	<p>Pressing F10 causes the following message to appear:</p> <p>Save configuration changes and exit setup? [OK] [Cancel]</p> <p>If “OK” is selected and the Enter key is pressed, all changes are saved and setup is exited. If “Cancel” is selected and the Enter key is pressed, or the ESC key is pressed, the user is returned to where they were before F10 was pressed without affecting any existing values.</p>

Upgrading the BIOS

The upgrade utility allows you to upgrade the BIOS in flash memory. The code and data in the upgrade file include the following:

- On-board BIOS, ATA-100 RAID BIOS, and PXE option ROMs for the devices that are embedded on the system board
- The Setup Utility
- The System BIOS

Preparing for the Upgrade

Before you upgrade the BIOS, prepare for the upgrade by recording the current BIOS settings, obtaining the upgrade utility, reviewing the release notes, and making a copy of the current BIOS.

In the unlikely event that a BIOS error occurs during the BIOS update process, see [“Recovering the BIOS”](#) for instructions on performing a BIOS recovery.

Recording the Current BIOS Settings

1. Boot the computer and press <F2> when you see the message:
`Press <F2> Key if you want to run SETUP`
2. Write down the current settings in the BIOS Setup program.

NOTE

Do not skip step 2. You will need these settings to configure your computer at the end of the procedure.

Obtaining the Upgrade

Download the BIOS image file to a temporary folder on your hard drive. See <http://support.intel.com/support/motherboards/server/SE7221BK1-E> for a link to the update software. If you chose to “Save Custom Defaults,” after the new BIOS is flashed, you can restore your settings from the “Load Custom Default” option.

 **NOTE**

Review the instructions distributed with the upgrade utility before attempting a BIOS upgrade. Review also any release notes in the release notes file that accompanies the new version of the BIOS. The release notes may contain critical information regarding jumper settings, specific fixes, or other information to complete the upgrade.

Creating a Bootable Diskette

1. Use a DOS system to create the diskette as follows:
2. Insert a diskette in diskette drive A.
3. At the C:\ prompt, for an unformatted diskette, type:

```
format a:/s
```

or, for a diskette that is already formatted, type:

```
sys a:
```
4. Press <Enter>.

Flash Update Utility

The BIOS flash utility suite is compatible with DOS, Windows*, and Linux*.

The afuXXX AMI Firmware Update Utilities are required for the BIOS updates.

DOS:

The flash bootable disk must have ROM image and afudos utility.

Type “run afudos /i<romfilename> [/n] [/p[b][n][c]].

Windows:

The flash disk must have ROM image, AMIFLDRV.SYS and AFUWIN.EXE.

From a command prompt, type AFUWIN /i<ROM filename> [/n] [/p[b][n][c]].

Linux

The flash disk must have ROM image and AFULNX.

Type (include floppy device) ./afulnx /i<ROM filename> [/n] [/p[b][n][c]].

From EFI Shell

The flash disk must have ROM image and AFUEFI.

Boot to EFI Shell with the flash disk.

Do a map -r to obtain the file system on the disk.

Change the drive to the flash disk. E.g., if the flash disk is fs0: type fs0: at the prompt.

Type `afuefi [/n] [/p[b][n][c]] <ROM filename>`

`/n` - don't check ROM ID

`/pbnc` - b - Program Boot Block

n - Program NVRAM

c - Destroy System CMOS

`/r` - registry path to store result of operation (only for Windows version)

`/k` - Program non-critical block only

`/q` - silent execution `/h` - print help

Wait while the BIOS files are updated. Do not power down the system during the BIOS update process! The system will reset automatically when the BIOS update process is completed. Remove the diskette from the diskette drive.

1. After the BIOS updates:
2. Check to make sure the BIOS version displayed during POST is the new version as the system reboots.
3. Enter Setup by pressing the F2 key during boot.
4. In Setup, press the F9 and <Enter> to set the parameters back to default values.
5. Re-enter the values you wrote down at the beginning of this process. Press F10 and <Enter> to exit the BIOS Setup and Save Changes.
6. If you do not set the CMOS values back to defaults using the F9 key, the system may function erratically.



NOTE

You may encounter a CMOS Checksum error or other problem after reboot. If this happens, shut down the system and boot it again. CMOS checksum errors require that you enter Setup, check your settings, save your settings, and exit Setup.

BIOS Selection and On-line Updates

An Online Update is the ability to update the BIOS while the server is in operation. Because the system contains two copies of the BIOS, you may update one while running from the other. Then select the second BIOS and boot to it. Rolling the BIOS also provides the ability to roll back to the other BIOS in case of a failure with the new version.

The active partition from which the system boots shall be referred to as the primary partition. The AMI FLASH update suite and Intel On-line updates preserve the existing BIOS image on the primary partition. The BIOS updates are diverted to the secondary partition. After the update, a

notification flag will be set. During the subsequent boot following the BIOS update, the system will continue to attempt to boot from the primary BIOS partition. On determining that a BIOS update occurred in the previous boot, the system will attempt to boot the new BIOS. If a failure happens, specialized hardware will switch back to the BIOS on the other partition, thus affecting a “Roll Back”.

Recovering the BIOS

In the rare event the system BIOS becomes corrupted and will not boot as a result, use the following BIOS recovery method to return the system to normal operation.

NOTE

BIOS recovery should only be used as last resort when the main system BIOS will not come up.

Manually Recovering the BIOS

1. Power down and unplug the system from the AC power source.
2. Move the recovery jumper at J1F2 from pins 9 and 10 to cover pins 10 and 11.

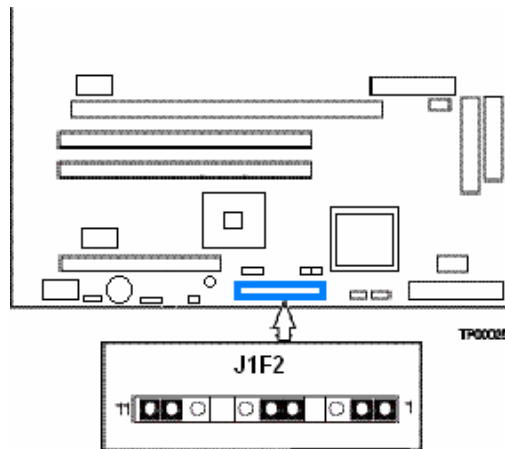


Figure 15. BIOS Recovery Jumper

1. Insert a bootable disk containing the file AMIBOOT.ROM (USB disk on key, CDRom or DVD, or split the ROM file among multiple diskettes using a “splitter” utility such as “split.exe”).
2. Plug the system into the AC power source and power it on.
3. The recovery process will automatically run. The system may beep throughout the recovery process. The recovery process is complete when the beeping stops.
4. Remove the flash media.
5. Power down and unplug the system from the AC power source.

6. Move the BIOS recovery jumper at J1F2 back to the original position, covering pins 9 and 10.
7. Plug the system into the AC power source and power it up to confirm that the recovery was successful.

NOTE

To use splitter.exe type the following command at the command prompt:

split AMIBOOT.ROM AMIBOOT 1024

The above command will create the files of sizes 1MB each with names AMIBOOT.000, AMIBOOT.001... and so on, depending upon the AMIBOOT.ROM file size.

Load the first disk with AMIBOOT.000. It will search the same disk for AMIBOOT.001. If it doesn't find the file in the floppy it will beep for one (1) second and search again.

Clearing the Password

If the user or administrator password(s) is lost or forgotten, moving the password clear jumper into the "clear" position clears both passwords. The password clear jumper must be restored to its original position before a new password(s) can be set. The password clear jumper is located on jumper block J1F2.

1. Power down the system and disconnect the AC power.
2. Open the server chassis.
3. Move the jumper from pins five and six to the Clear Password position, covering pins six and seven.
4. Reconnect the AC power, power up the system.
5. Power down the system and disconnect the AC power.
6. Return the Password Clear jumper to the spare location, covering pins five and six.
7. Close the server chassis.

Clearing the CMOS

If you are not able to access the BIOS setup screens, the CMOS Clear jumper will need to be used to reset the configuration RAM. The CMOS Clear jumper is located on jumper block J1F2.

1. Power down the system and disconnect the AC power.
2. Open the server.
3. Move the jumper from pins one and two to the Clear CMOS position, covering pins two and three.
4. Reconnect the AC power, power up the system.
5. When the system begins beeping, power it down and disconnect the AC power.
6. Return the CMOS Clear jumper to the original location, covering pins one and two.
7. Close the server chassis, reconnect the AC power and power up the system.

4 Troubleshooting

This chapter helps you identify and solve problems that might occur while you are using the system.

For any issue, first ensure you are using the latest firmware and files. Firmware upgrades include updates for the BIOS, and the mini baseboard management controller (mBMC). See <http://support.intel.com/support/motherboards/server/SE7221BK1-E> or a link to the software updates. In addition to the server firmware and files, also update any drivers used for components you have installed in your system, such as video drivers, network drivers, and other add-in cards.

If you are unable to resolve your server problems on your own, see <http://support.intel.com/support/motherboards/server/SE7221BK1-E> for assistance.

Resetting the System

Before proceeding with in-depth troubleshooting, first attempt to reset your system using one of the methods below.

To do this:	Press:
Soft boot reset to clear the system memory and reload the operating system.	<Ctrl+Alt+Del>
Clear system memory. Restart POST, and reload the operating system.	Reset button
Cold boot reset. Turn the system power off and then on. This clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals.	Power off/on

Problems Following Initial System Installation

Problems that occur at initial system startup are usually caused by an incorrect installation or configuration. Hardware failure is a less frequent cause. If the problem you are experiencing is with a specific software application, see [Problems With Newly Installed Application Software](#).

First Steps Checklist

- Is AC power available at the wall outlet?
- Are the power supplies plugged in? Check the AC cable(s) on the back of the chassis and at the AC source.
- Are all cables correctly connected and secured?
- Are the processors fully seated in their sockets on the server board?
- Are all standoffs in the proper location and not touching any components, causing a potential short?
- Are all add-in PCI boards fully seated in their slots on the server board?
- Are all jumper settings on the server board correct?
- Are all jumper and switch settings on add-in boards and peripheral devices correct? To check these settings, refer to the manufacturer’s documentation that comes with them. If applicable, ensure that there are no conflicts—for example, two add-in boards sharing the same interrupt.

- Are all peripheral devices installed correctly?
- If the system has a hard disk drive, is it properly formatted or configured?
- Are all device drivers properly installed?
- Are the configuration settings made in Setup correct?
- Is the operating system properly loaded? Refer to the operating system documentation.
- Did you press the system power on/off switch on the front panel to turn the server on (power on light should be lit)?
- Is the system power cord properly connected to the system and plugged into a NEMA 5-15R outlet for 100-120 V~ or a NEMA 6-15R outlet for 200-240 V~?
- Are all integrated components from the tested components lists? Check the tested memory, and chassis lists, as well as the supported hardware and operating system list. See <http://support.intel.com/support/motherboards/server/SE7221BK1-E> for links to the tested component lists.

Hardware Diagnostic Testing

This section provides a more detailed approach to identifying a hardware problem and locating its source.



CAUTION

Turn off devices before disconnecting cables: Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.

1. Turn off the system and all external peripheral devices. Disconnect each device from the system, except for the keyboard and the video monitor.
2. Make sure the system power cord is plugged into a properly grounded AC outlet.
3. Make sure your video display monitor and keyboard are correctly connected to the system. Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges (see the documentation supplied with your video display monitor).
4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in drive A and no CD-ROM disk in the CD-ROM drive.
5. If the power LED does light, attempt to boot from a floppy diskette or from a CD-ROM disk.
6. Turn on the system. If the power LED does not light, see [Power Light Does Not Light](#).

Verifying Proper Operation of Key System Lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly. Check for the following:

- Does the diskette drive activity light turn on briefly? If not, see [Diskette Drive Activity Light Does Not Light](#).
- If system LEDs are illuminated, see Error Handling and Reporting in section on Troubleshooting.

Confirming Loading of the Operating System

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see [No Characters Appear on Screen](#).

Specific Problems and Corrective Actions

This section provides possible solutions for these specific problems:

- Power light does not light.
- No characters appear on screen.
- Characters on the screen appear distorted or incorrect.
- System cooling fans do not rotate.
- Diskette drive activity light does not light.
- Hard disk drive activity light does not light.
- CD-ROM drive activity light does not light.
- There are problems with application software.
- The bootable CD-ROM is not detected.

Try the solutions below in the order given. If you cannot correct the problem, contact your service representative or authorized dealer for help.

Power Light Does Not Light

Check the following:

- Did you press the power-on button?
- Is the system operating normally? If so, the power LED might be defective or the cable from the front panel to the server board might be loose.
- Have you securely plugged the server AC power cord into the power supply?
- Is the power supply correctly set to 110V?
- Will other items plugged into the same power outlet function correctly?

- Some ATX power supplies have a power switch on the back of the power supply, next to the fan. If your system has one, is it turned on?
- Remove all add-in cards and see if the system boots. If successful, add the cards back in one at a time with a reboot between each addition.
- Make sure the memory DIMMs comply with the system requirements.
- Make sure the memory DIMMs have been populated according to the system requirements.
- Remove the memory DIMMs and re-seat them.
- Make sure the processor(s) comply with the system requirements.
- Make sure the processor(s) have been populated according to the system requirements.
- Remove the processor(s) and re-seat them.
- Make sure the chassis standoffs are installed only below mounting holes. Misplaced standoffs can contact the pins on the bottom of the server board and cause a short.

No Characters Appear on Screen

Check the following:

- Is the keyboard functioning? Test it by turning the “Num Lock” function on and off to make sure the Num Lock light is functioning.
- Is the video monitor plugged in and turned on? If you are using a switch box, is it switched to the correct system?
- Are the brightness and contrast controls on the video monitor properly adjusted?
- Is the video monitor signal cable properly installed?
- Does this video monitor work correctly if plugged into a different system?
- Is the onboard video controller enabled in the BIOS?
- Remove all add-in cards and see if the video returns. If successful, add the cards back in one at a time with a reboot between each addition.
- Make sure the memory DIMMs comply with the system requirements.
- Make sure the memory DIMMs have been populated according to the system requirements.
- Remove the memory DIMMs and re-seat them.
- Make sure the processor(s) comply with the system requirements.
- Make sure the processor(s) have been populated according to the system requirements.
- Remove the processor(s) and re-seat them.

Characters Are Distorted or Incorrect

Check the following:

- Are the brightness and contrast controls properly adjusted on the video monitor? See the manufacturer’s documentation.
- Are the video monitor’s signal and power cables properly installed?
- Does this video monitor work correctly if plugged into a different system?

System Cooling Fans Do Not Rotate Properly

If the system cooling fans are not operating properly, it is an indication of possible system component failure.

Check the following:

- Is the power-on light lit? If not, see [Power Light Does Not Light](#).
- If your system has LED lights for the fans, is one or more of these LEDs lit?
- Are any other front panel LEDs lit?
- Have any of the fan motors stopped? Use the server management subsystem to check the fan status.
- Have your fans speeded up in response to an overheating situation?
- Have your fans speeded up in response to a fan that has failed?
- Are the fan power connectors properly connected to the server board?
- Is the cable from the front panel board connected to the both the front panel board and to the server board?
- Are the power supply cables properly connected to the server board?
- Are there any shorted wires caused by pinched-cables or have power connector plugs been forced into power connector sockets the wrong way?

Diskette Drive Activity Light Does Not Light

Check the following:

- Is the diskette drive's power and signal cables properly installed?
- Are all relevant switches and jumpers on the diskette drive set correctly?
- Is the diskette drive properly configured?
- Is the diskette drive activity light always on? If so, the signal cable may be plugged in incorrectly.

If you are using the onboard diskette controller, use the BIOS setup to make sure that "Onboard Floppy" is set to "Enabled." If you are using an add-in diskette controller, make sure that "Onboard Floppy" is set to "Disabled."

CD-ROM Drive or DVD-ROM Drive Activity Light Does Not Light

Check the following:

- Are the CD-ROM/DVD-ROM drive's power and signal cables properly installed?
- Are all relevant switches and jumpers on the drive set correctly?
- Is the drive properly configured?

Cannot Connect to a Server

- Make sure the network cable is securely attached to the correct connector at the system back panel.
- Try a different network cable.
- Make sure you are using the most recent version of the correct device drivers. Please see http://downloadfinder.intel.com/scripts-df/support_intel.asp# for a link to the current drivers.
- Make sure the driver is loaded and the protocols are bound.
- Make sure the hub port is configured for the same duplex mode as the network controller.
- Make sure the correct networking software is installed.
- If you are directly connecting two servers (without a hub), you will need a crossover cable.
- Check the network controller LEDs next to the NIC connectors.

Problems with Network

The server hangs when the drivers are loaded.

- Certain drivers may require interrupts that are not shared with other PCI drivers. For these drivers, it may be necessary to alter settings so that interrupts are not shared. See the documentation that came with your PCI card(s) for information on changing interrupts..

Diagnostics pass but the connection fails.

- Make sure the network cable is securely attached.
- Make sure you specify the correct frame type in your NET.CFG file.

The controller stopped working when an add-in adapter was installed.

- Make sure the cable is connected to the port from the onboard network controller.
- Make sure your BIOS is current. See <http://support.intel.com/support/motherboards/server/SE7221BK1-E> for a link to the current version.
- Make sure the other adapter supports shared interrupts. Make sure your operating system supports shared interrupts.
- Try reseating the add-in adapter.
- The add-in adapter stopped working without apparent cause.
- Try reseating the adapter first; then try a different slot if necessary.
- The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- Run the diagnostics.

System Boots When Installing PCI Card

System Server Management features require full-time “standby” power. This means some parts of the system have power going to them whenever the power cord is plugged in, even if you have turned the system power off with the power button on the front panel. If you install a PCI card with the AC power cord plugged in, a signal may be sent to the command the system to boot. Before installing a PCI card, you should always:

- Turn off the server power by using the power button on the front of the system.
- Unplug the AC power cord(s) from the server.

Problems With Newly Installed Application Software

Problems that occur when you run new application software are usually related to the software, not the server hardware. Faulty equipment is unlikely, especially if other software runs correctly.

Check the following:

- Make sure the system meets the minimum hardware requirements for the software. See the software documentation.
- Make sure the software is properly installed and configured for the system. See the software documentation.
- Use only an authorized copy. Unauthorized copies often do not work.
- If you are running the software from a diskette, CD-ROM or DVD-ROM, try a different diskette.
- Make sure the correct device drivers installed.

If the problems persist, contact the software vendor’s customer service representative.

Problems With Application Software That Ran Correctly Earlier

Problems that occur after the system hardware and software have been running correctly sometimes indicate equipment failure. However, they can also be caused by file corruption or changes to the software configuration.

Check the following:

- If you are running the software from a diskette, CD-ROM or DVD-ROM, try a different diskette.
- Uninstall and reinstall the software. Make sure all necessary files are installed.
- If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.
- If you suspect that a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.

 **NOTE:**

Random errors in data files: If you are getting random errors in your data files, they may be getting corrupted by voltage spikes on your power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, you may want to install a surge suppressor between the power outlet and the system power cord.

Devices Are Not Recognized Under Device Manager (Windows* Operating System)

The Windows* operating systems do not include all of the drivers for the Intel® chipsets, onboard NICs, and other components. See <http://support.intel.com> or a link to the current drivers and chipset files.

Hard Drive(s) Are Not Recognized

Check the following:

- Make sure the drive is not disabled in the BIOS Setup.
- Make sure the drive is connected correctly and that is plugged into the power supply.
- Make sure the drive is compatible. See <http://www.support.intel.com/support/motherboards/server/SE7221BK1-E> for a link to the tested drives.
- Make sure you have not exceeded the power budget for the server. See <http://www.support.intel.com/support/motherboards/server/SE7221BK1-E> for a link to software to check your power budget.
- If using IDE drives, verify that the master/slave settings are set correctly. See your drive documentation for details on setting the master/slave settings.
- If using a RAID configuration with SATA drives, make sure the RAID is setup correctly.

Bootable CD-ROM Is Not Detected

Check the following:

- Make sure the BIOS is configured to allow the CD-ROM to be the first bootable device.

Error Handling and Reporting

LED Information

The Intel® Server Board SE7221BK1-E includes LEDs that can aid in troubleshooting your system. A table of these LEDs with a description of their use is listed below.

Table 7. LED Information

LED Name	Function	Location	Color	Correction
ID	Aid in server identification from the back panel	Front Panel and board rear	Blue	Press ID LED button or user Server Management software to turn off the LED.
System fault	Visible fault warning	Front panel and board rear	Green or Amber	<ul style="list-style-type: none"> ▪ On = No Fault ▪ Green Blink = degraded ▪ Amber = critical error or non-recoverable ▪ Amber blink = non-critical Blinking = Activity. No action required.
IDE activity	Front panel	Front panel and board left side	Green	Blinking = Activity. No action required.
Memory fault 1–4	Identify failing memory module	DIMM end front of board	Amber	On = Fault
POST code 1–4 (LSB, bit1, bit2, MSB)	Display boot 80 POST code	Rear of board	Each LED can be Off, Green, Amber, Red	See the POST code table
Fan Pack Fault	Warn on fan failure	Front center board	Amber	On = Fault
CPU Fan Fault	Identify fan failure	Front center board	Amber	On = Fault
CPU Fault	Identify processor failure	1" behind processor socket	Amber	On = Fault
5v Standby	Identify 5v standby power on state	Front left board	Amber	On = 5v standby power on
Power LED	Identify the power state of the system	Front Panel	Green	<ul style="list-style-type: none"> ▪ Off = Power is off (off or S5) ▪ On = Power on or S0) ▪ Slow Blink = Low power state (S1 – S3)

BIOS Event Log

The BIOS will output the current boot progress codes on the video screen. Progress codes are 32 bit quantities plus optional data. The 32 bit numbers include Class, Subclass and Operation information. Class and Subclass point to the type of the hardware that is being initialized, where as the Operation field represents the specific initialization activity. Based upon the data bit availability to display Progress Code, a progress code can be customized to fit the data width. The higher the data bit, higher the granularity of information, which could send on the progress port. The progress codes may be reported by the system BIOS or the option ROMs.

The Response section in following table is divided in 3 different types

Warning – The message is displayed on screen and error is logged in SEL. System will continue booting with degraded state. User may want to replace erroneous unit

Pause – The message is displayed on screen and user input is required to continue. User can take immediate corrective action or can choose to continue booting.

Halt – System cannot boot unless error is resolved. User needs to replace faulty part and restart the system.

Table 8. Post Error Messages and Handling

Error Code	Error Message	Response
100	Timer Error	Warning
103	CMOS Battery Low	Warning
104	CMOS Settings Wrong	Warning
105	CMOS Checksum Bad	Warning
10B	CMOS Memory Size different	Warning
112	CMOS Time Not Set	Warning
140	Refresh Timer Test Failed	Halt
141	Display Memory Test Failed	Warning
142	CMOS Display Type Wrong	Pause
147	Unknown BIOS error. Error code = 147 (this is really a PMM_MEM_ALLOC_ERR)	Halt
148	Password Check Failed	Halt
149	Unknown BIOS Error. Error code = 149 (this is really SEGMENT_REG_ERR)	Halt
14A	Unknown BIOS Error. Error code = 14A (this is really ADM_MODULE_ERR)	Warning
14B	Unknown BIOS Error. Error code = 14B (this is really LANGUAGE_MODULE_ERR)	Warning
14D	Primary Master Hard Disk Error	Pause
14E	Primary Slave Hard Disk Error	Pause
14F	Secondary Master Hard Disk Error	Pause
150	Secondary Slave Hard Disk Error	Pause
151	Primary Master Drive - ATAPI Incompatible	Pause
152	Primary Slave Drive - ATAPI Incompatible	Pause

Error Code	Error Message	Response
153	Secondary Master Drive - ATAPI Incompatible	Pause
154	Secondary Slave Drive - ATAPI Incompatible	Pause
8100	Processor Failed BIST	Warning
8110	Processor Internal Error (IERR)	Warning
8120	Processor Thermal Trip Error	Warning
8160	Processor Unable to Apply BIOS Update	Pause
8170	Processor L2 Cache Failed	Pause
8180	BIOS does not support current stepping for Processor	Pause
8190	Watchdog Timer failed on last boot	Warning
8191	12:1 Core to bus ratio: Processor Cache disabled	Pause
8192	L2 Cache size mismatch	Pause
8193	CPUID, Processor Stepping are different	Pause
8194	CPUID, Processor Family are different	Pause
8195	Front Side Bus Speedismatch. System Halted	Pause
8197	CPU Speed mismatch	Pause
8300	Baseboard Management Controller failed to function	Pause
8301	Front Panel Controller failed to Function	Pause
84F2	Server Management Interface Failed	Pause
84F3	BMC in Update Mode	Pause
84F4	Sensor Data Record Empty	Pause
84FF	System Event Log Full	Warning

BIOS POST Beep Codes

The table below lists the POST error beep codes. Prior to system video initialization, the BIOS uses these beep codes to inform users of error conditions. The beep code occurs only when a critical error occurs or when the BIOS fails to boot to the operating system. Please note that not all error conditions are supported by the BIOS beep codes.

Table 9. Beep Codes

Number of Beeps	Description
1	Refresh failure
2	Parity cannot be reset
3	First 64 Kb memory failure
4	Timer not operational
5	Processor failure (Reserved; not used)
6	8042 GateA20 cannot be toggled (memory failure or not present)
7	Exception interrupt error
8	Display memory R/W error
9	(Reserved; not used)
10	CMOS Shutdown register test error
11	Invalid BIOS (such as, POST module not found)

An error or warning condition at boot can result in a series of beeps being issued known as "beep codes. These beeps have a code that identifies system or PCI card events. For example, some Intel® RAID cards have beep codes. Before checking for a system beep code error make sure the PCI card is not causing the beeping.

In the case of a Bootblock update, where video is not available for text messages to be displayed, speaker beeps are necessary to inform the user of errors. For beep codes associated with a Bootblock update refer to the *Intel® Server Board SE7221BK1-E Technical Product Specification*.

Regulatory and Compliance Information

Product Regulatory Compliance

Product Safety Compliance

The server board SE7221BK1-E complies with the following safety requirements:

- UL60950 – CSA 60950(USA / Canada)
- EN60950 (Europe)
- IEC60950 (International)
- CB Certificate & Report, IEC60950 (report to include all country national deviations)
- GOST R 50377-92 – Listed on one System License (Russia)
- Belarus License – Listed on System License (Belarus)
- CE - Low Voltage Directive 73/23/EEE (Europe)
- IRAM Certification (Argentina)

Product EMC Compliance – Class A Compliance

Note: Legally the product is required to comply with Class A emission requirements as it is intended for a commercial type market place. Intel targets 10db margin to Class A Limits

The server board SE7221BK1-E has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations when installed a compatible Intel® host system. For information on compatible host system(s) refer to Intel's Server Builder Web site or contact your local Intel representative.

- FCC /ICES-003 - Emissions (USA/Canada) Verification
- CISPR 22 – Emissions (International)
- EN55022 - Emissions (Europe)
- EN55024 - Immunity (Europe)
- CE – EMC Directive 89/336/EEC (Europe)
- AS/NZS 3548 Emissions (Australia / New Zealand)
- BSMI CNS13438 Emissions (Taiwan)
- GOST R 29216-91 Emissions - Listed on one System License (Russia)
- GOST R 50628-95 Immunity –Listed on one System License (Russia)
- Belarus License – Listed on one System License (Belarus)
- RRL MIC Notice No. 1997-41 (EMC) & 1997-42 (EMI) (Korea)

Certifications / Registrations / Declarations





- UL Certification (US/Canada)
- CE Declaration of Conformity (CENELEC Europe)
- FCC/ICES-003 Class A Attestation (USA/Canada)

- C-Tick Declaration of Conformity (Australia)
- MED Declaration of Conformity (New Zealand)
- BSMI Certification (Taiwan)
- GOST – Listed on one System License (Russia)
- Belarus – Listed on one System License (Belarus)
- RRL Certification (Korea)
- Ecology Declaration (International)

Product Regulatory Compliance Markings

This product is marked with the following Product Certification Markings:

Table 10. Product Certification Markings

Regulatory Compliance	Country	Marking
UL Mark	USA/Canada	
CE Mark	Europe	
FCC Marking (Class A)	USA	This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. Manufactured by Intel Corporation
EMC Marking (Class A)	Canada	CANADA ICES-003 CLASS A CANADA NMB-003 CLASSE A
BSMI Marking (Class A)	Taiwan	 <div style="border: 1px solid black; padding: 5px; width: fit-content;">警告使用者： 這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策</div>
RRL MIC Mark	Korea	

Electromagnetic Compatibility Notices

FCC (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124-6497
1-800-628-8686

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals, that are not shielded and grounded may result in interference to radio and TV reception.

Industry Canada (ICES-003)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadien des Communications.
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This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled: "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

Europe (CE Declaration of Conformity)

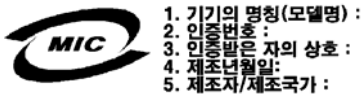
This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

Taiwan Declaration of Conformity (BSMI)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

The BSMI Certification Marking and EMC warning is located on the outside rear area of the product.

Korean Compliance (RRL)



English translation of the notice above:

1. Type of Equipment (Model Name): On License and Product
2. Certification No.: On RRL certificate. Obtain certificate from local Intel representative
3. Name of Certification Recipient: Intel Corporation
4. Date of Manufacturer: Refer to date code on product
5. Manufacturer/Nation: Intel Corporation/Refer to country of origin marked on product

Getting Help

World Wide Web

<http://support.intel.com/support/motherboards/server/SE7221BK1-E>

Telephone

All calls are billed US \$25.00 per incident, levied in local currency at the applicable credit card exchange rate plus applicable taxes. (Intel reserves the right to change the pricing for telephone support at any time without notice).

Before calling, fill out an Intel® Server Issue Report. A sample form is provided on the following pages. However, for the fastest service, please submit your form via the Internet.

In U.S. and Canada	1-800-404-2284
In Europe	
UK 0870 6072439	Finland 9 693 79297
France 01 41 918529	Denmark 38 487077
Germany 069 9509 6099	Norway 23 1620 50
Italy 02 696 33276	Sweden 08 445 1251
Spain 91 377 8166	Holland 020 487 4562
Belgium 02 714 3182	
In Asia-Pacific region	
Australia 1800 649931	Indonesia 803 65 7249
Hong Kong 852 2 844 4456	Malaysia 1 800 80 1390
Korea 822 767 2595	New Zealand 0800 444 365
China 800 820 1100 (toll-free)	Pakistan 632 63684 15 (IDD via Philippines)
8 621 33104691 (not toll-free)	Philippines 1 800 1 651 0117
Singapore 65 6213-1311	Thailand 1 800 631 0003
India 0006517 2 68303634 (manual toll-free. From India, you need an IDD-equipped telephone)	Vietnam 632 6368416 (IDD via Philippines)
Taiwan 2 2545-1640	Myanmar 63 2 636 9796 (via Philippines)
	Cambodia 63 2 636 9797 (via Philippines)
In Japan	
0120 868686 (Domestic)	81 298 47 0800 (outside country)

In Latin America	
Brazil	001-916 377 0180
Mexico	Contact AT&T USA at 001 800 462 628 4240. Once connected, dial 800 843 4481
Colombia	Contact AT&T USA at 01 800 911 0010. Once connected, dial 800 843 4481
Costa Rica	Contact AT&T USA at 0 800 0 114 114. Once connected, dial 800 843 4481
Panama	Contact AT&T USA at 00 800 001 0109. Once connected, dial 800 843 4481
Chile (Easter Island)	Contact AT&T USA at 800 800 311. Once connected, dial 800 843 4481
Chile (Mainland and Juan)	Contact AT&T USA at 800 225 288. Once connected, dial 800 843 4481
Miami	1 800 621 8423
Ecuador (Andimate)	Contact AT&T USA at 1 999 119. Once connected, dial 800 843 4481
Ecuador (Pacifictel)	Contact AT&T USA at 1 800 225 528. Once connected, dial 800 843 4481
Guatemala	Contact AT&T USA at 99 99 190. Once connected, dial 800 843 4481
Venezuela	Contact AT&T USA at 0 800 2255 288. Once connected, dial 800 843 4481
Argentina	Contact AT&T USA at 0-800 222 1288. Once connected, dial 800 843 4481
Paraguay	001 916 377 0114
Peru	001 916 377 0114
Uruguay	001 916 377 0114

For an updated support contact list, see <http://support.intel.com/support/9089.htm>

Intel® Server Issue Report Form

Date Submitted: _____

Company Name: _____

Contact Name: _____

Email Address: _____

Intel Server Product: _____

Priority (Critical, Hot, High, Low): _____

Brief Problem Description. Provide a brief description below. See the last page for space to include a detailed problem description.

Board / Chassis Information

Baseboard Revision – PBA#:	DIMM Configuration
Baseboard Serial Number:	DIMM1A MB:
CPU1 Speed/Stepping/Spec:	DIMM1A Vendor/part number:
System BIOS Version:	DIMM1B Vendor/part number:
HSC Firmware Version:	DIMM2A MB:
Chassis Model	DIMM2A Vendor/part number:
<input type="checkbox"/> Intel® SC5250-E	
<input type="checkbox"/> Intel® SR1425BK1-E	
<input type="checkbox"/> Other (Vendor / Model):	

Operating System Information

Operating System _____

Version _____

Service Pack _____

Peripheral Information

Check each box below that is used, and provide the requested information

Peripheral	Card Or Peripheral Description	Driver Revision	IRQ #	I/O Base Address	FW Rev#
	PCI Slot 1 (32/33)				
	PCI Slot 3 (64/100)				
	PCI Slot 4 (64/100)				
	PCI Slot 5 (adaptive or PCI-Express*)				
Video					
<input type="checkbox"/>	On-Board Video				
NIC					
<input type="checkbox"/>	On-Board NIC1				
<input type="checkbox"/>	On-Board NIC2 (1.0 Gb)				

Hard Drive Information:

- SATA # of drives installed: _____
Make/Model/Firmware Revision _____
- IDE # of drives installed: _____
Make/Model/Firmware Revision _____
- SCSI # of drives installed: _____
Make/Model/Firmware Revision _____

