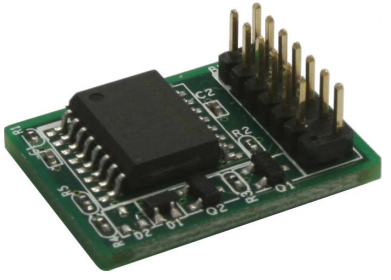
ASMB4-iKVM/ ASMB4-SOL PLUS

Server Management Board



E6568

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Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

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

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

The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

REACH

Complying with the REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS website at http://csr.asus.com/english/REACH.htm.

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to http://csr.asus.com/english/Takeback.htm for detailed recycling information in different regions.

DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the server.
- When adding or removing devices to or from the server, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing server before you add a device.
- Before connecting or removing signal cables from the server, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing any component to the server, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the server management board.

How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the server management board features and the new technologies it supports.

- **Chapter 2: Installation**

  This chapter provides instructions on how to install the board to the server system and install the utilities that the board supports.

- **Chapter 3: ASUS Remote Console**

  This chapter tells you how to use the ASUS Remote Console (ARC) that the server management board supports.

- **Chapter 4: Web-based user interface (ASMB4-iKVM only)**

  This chapter tells you how to use the web-based user interface that the server management board supports.

- **Appendix: Reference Information**

  The Appendix shows the location of the LAN ports for server management and BMC connector on server motherboards. This section also presents common problems that you may encounter when installing or using the server management board.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

   The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

   Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. Example: <Enter> means that you must press the Enter or Return key.
<Key1+Key2+Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: <Ctrl+Alt+D>
`Command`	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets. Example: At the DOS prompt, type the command line: `format a:`

ASMB4-iKVM/ASMB4-SOL PLUS specifications summary

Chipset	Aspeed 2050
Internal RAM	56 Mb for system 8 Mb for video
Internal ROM	16 Mb
Timers	32-bit Watchdog Timer
Main features	IPMI 2.0-compliant and supports KVM over LAN Web-based user interface (remote management) Virtual media
Form factor	22 mm x 17 mm

*** Specifications are subject to change without notice.**

This chapter describes the server management board features and the new technologies it supports.

1 Product introduction

1.1 Welcome!

Thank you for buying an ASUS® ASMB4-iKVM/ASMB4-SOL PLUS server management board!

The ASUS ASMB4-iKVM/ASMB4-SOL PLUS is an Intelligent Platform Management Interface (IPMI) 2.0-compliant board that allows you to monitor, control, and manage a remote server from the local or central server in your local area network (LAN). With ASMB4-iKVM/ASMB4-SOL PLUS plugging in a server motherboard, you can completely and efficiently monitor your server in real-time. The solution allows you to reduce IT management costs and increase the productivity.

Before you start installing the server management board, check the items in your package with the list below.

1.2 Package contents

Check your server management board package for the following items.

- ASUS ASMB4-iKVM/ASMB4-SOL PLUS board
- Support CD
- User guide

If any of the above items is damaged or missing, contact your retailer.

1.3 Features

1. IPMI 2.0

- System interface (KCS)
- LAN interface (support RMCP+)
- System Event Log (SEL)
- Sensor Data Record (SDR)
- Field Replaceable Unit (FRU)
- Remote Power on/off, reboot
- Serial Over LAN (SOL)
- Authentication Type: RAKP-HMAC-SHA1
- Encryption (AES)
- Platform Event Filtering (PEF)
- Platform Event Trap (PET)
- Watchdog Timer

2. Private I2C Bus

- Auto Monitoring sensors (temperature, voltage, fan speed and logging events

3. PMBus*

- Support Power supply for PMBus device

4. PSMI*

- Support Power supply for PSMI bus device

5. Web-base GUI

- Monitor Sensor, show SDR, SEL, FRU, configure BMC, LAN
- Support SSL (HTTPS)
- Multiple user permission level
- Upgrade BMC firmware

6. Update Firmware

- DOS Tool
- Web GUI (Windows® XP/Vista/2003/2008, RHEL5.2, SLES10SP2

7. Notification

- PET
- SNMP Trap
- e-Mail

8. KVM over Internet (ASMB4-iKVM only)

- Web-based remote console

9. Remote Update BIOS (ASMB4-iKVM only)

- Use Remote floppy to update BIOS

10. Remote Storage (Virtual Media) (ASMB4-iKVM only)

- Support two remote storage for USB/CD-ROM/DVD and image

11. Remote Install OS (ASMB4-iKVM only)

- Use remote storage to remote install OS

*** A power supply supported PMBus and PSMI is necessary.**
**** Specifications are subject to change without notice.**

1.4 System requirements

Before you install the ASMB4-iKVM/ASMB4-SOL PLUS board, check if the remote server system meets the following requirements:

- ASUS server motherboard with Baseboard Management Controller (BMC) connector*
- LAN (RJ-45) port for server management**
- Microsoft® Internet Explorer 5.5 or later; Firefox

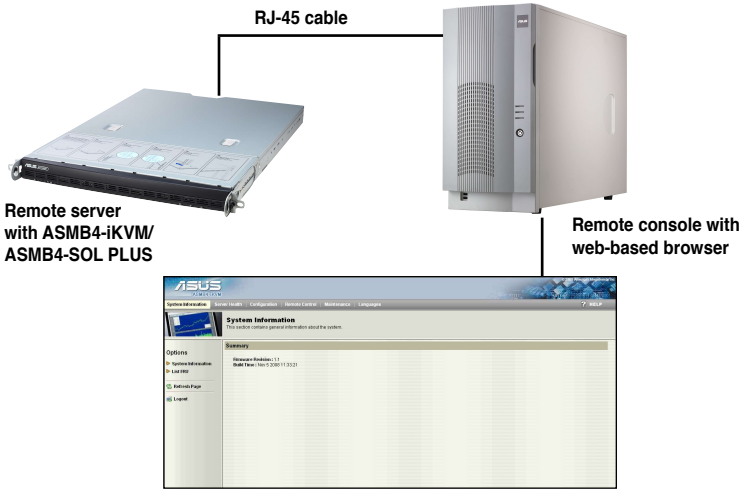
* Visit the ASUS website (www.asus.com) for an updated list of server motherboards that support the ASMB4-iKVM/ASMB4-SOL PLUS.

** See the Appendix for details.

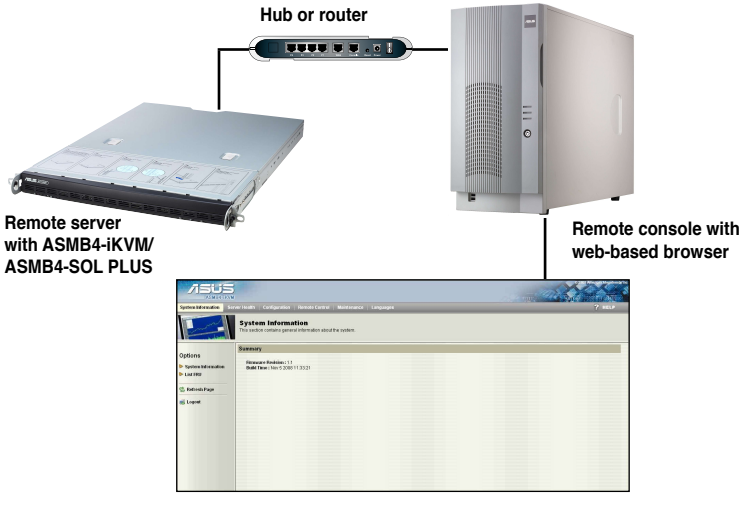
1.5 Network setup

The ASMB4-iKVM/ASMB4-SOL PLUS server management board installed on the remote server connects to a local/central server via direct LAN connection or through a network hub. Below are the supported server management configurations.

Direct LAN connection



LAN connection through a network hub



This chapter provides instructions on how to install the board to the server system and install the utilities that the board supports.

2 Installation

2.1 Before you proceed

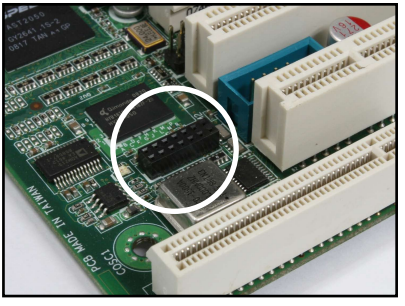
Take note of the following precautions before you install the server management board to the remote server system.

- Unplug the server system power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or to a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, ensure that the power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.2 Hardware installation

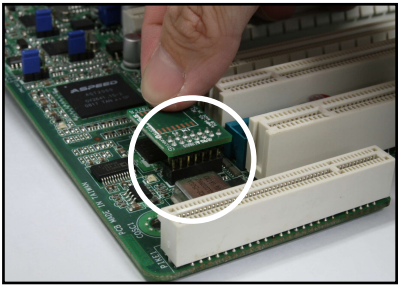
To install the server management board:

1. Remove the remote server system cover, and then locate the Baseboard Management Controller (BMC) connector on the motherboard.

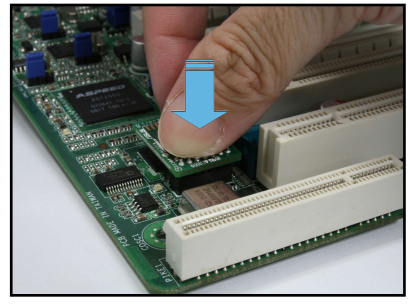


Refer to the Appendix section for the location of the BMC connector on supported motherboards.

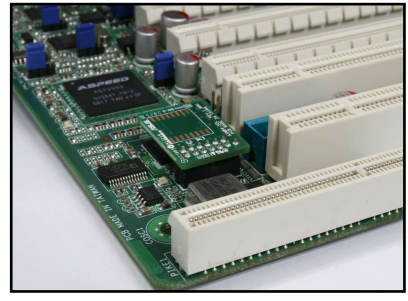
2. Place the board on the BMC connector of the motherboard, aligning with the pin connectors.



3. Press the board firmly until it is completely seated in place.



4. When installed, the board appears as shown.



5. Reinstall the remote server system cover, then connect the power plug to a grounded wall socket.

Everytime after the AC power is re-plugged, you have to wait for about 30 seconds for the system power up.

6. Insert the LAN cable plug to the LAN port for server management.

Refer to the Appendix for the location of the LAN port for server management.

7. For direct LAN configuration, connect the other end of the LAN cable to the local/central server LAN port.

   For connection to a network hub or router, connect the other end of the LAN cable to the network hub or router.

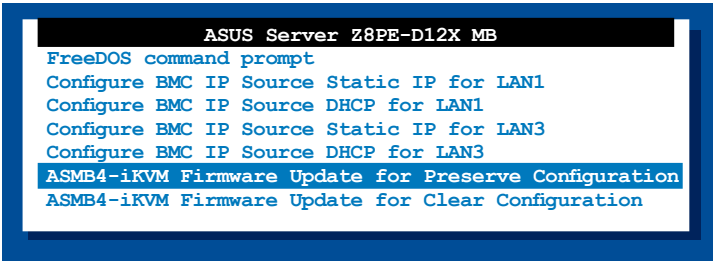
2.3 Firmware update and IP configuration

You need to update the ASMB4-iKVM/ASMB4-SOL PLUS firmware and configure IP source before you start using the ASMB4-iKVM/ASMB4-SOL PLUS board.

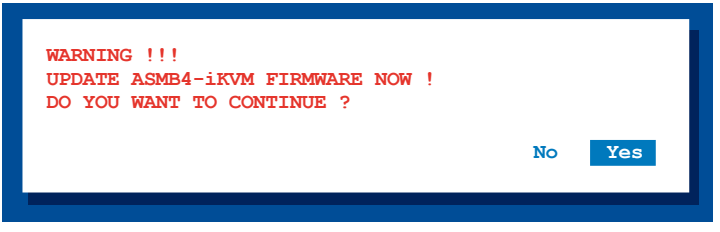
2.3.1 Firmware update

To update the firmware:

1. Insert the support CD into the optical drive.
2. Restart the remote server, then press <Del> during POST to enter the BIOS setup.
3. Go to Boot menu and set the Boot Device Priority item to [CD-ROM].
4. When finished, press <F10> to save your changes and exit the BIOS setup.
5. On reboot, the main menu appears. Select **ASMB4-iKVM (or ASMB4-SOL PLUS) Firmware Update for Preserve Configuration**, and press <Enter> to enter the sub-menu.



6. A confirmation message appears, asking whether you want to update the firmware or not. Select <Yes> to update.



The firmware updating process starts.

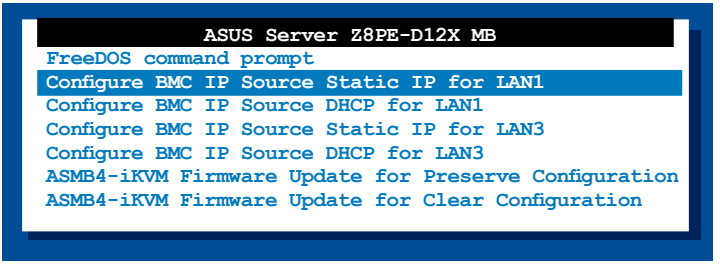
7. When the update process is completed, the following screen appears.

```
NewImageSize = 10MB, offs = 0

Uploading Firmware Image : Completed


Flash Update Completed


Device Firmware has been upgraded successfully.
The device will be reset within 10 seconds for the new firmware
to take effectt.
Press any key to continue ...
```

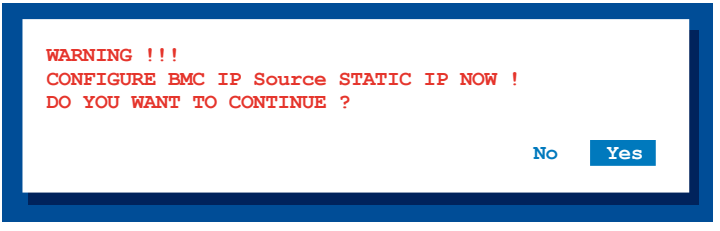
You may update firmware from the web-based user interface. Refer to page 4-13 for details.

2.3.2 Configure BMC IP source static IP

1. Repeat the step 1-4 in the previous sub-section.
2. On reboot, the main menu appears.Select **Configure BMC IP Source Static IP for LAN1 (or LAN3)**, and press <Enter> to enter the sub-menu.



3. A confirmation message appears, asking if you want to configure the BMC IP source static IP now. Select <Yes> to continue.

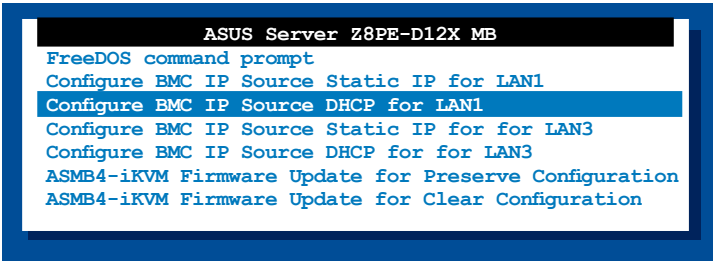


4. When the configuration is completed, the below screen appears.

5. Go to BIOS menu to set the IP. Refer to section 2.4 for IP settings in BIOS menu.

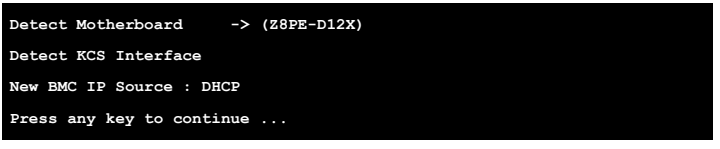
2.3.3 Configure BMC IP source DHCP

1. Repeat the step 1-4 in the previous sub-section.
2. On reboot, the main menu appears.Select **Configure BMC IP Source DHCP for LAN1 (or LAN3)**, and press <Enter> to enter the sub-menu.



3. A confirmation message appears, asking if you want to configure the BMC IP source DHCP now. Select <Yes> to continue.

4. When the configuration is completed, the below screen appears.



5. Then you can get IP from DHCP server.

2.4 BIOS configuration

You need to adjust the settings in the BIOS setup of the remote server for correct configuration and connection to the central server.

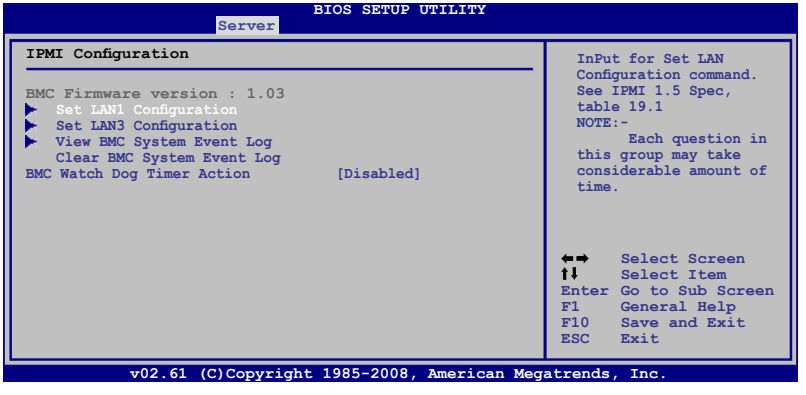
- Update the remote server BIOS file following the instructions in the motherboard/system user guide. Visit the ASUS website (www.asus.com) to download the latest BIOS file for the motherboard.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

Running the BIOS IPMI configuration

To configure the IPMI in the BIOS:

1. Restart the remote server, then press <Del> during POST to enter the BIOS setup.
2. Go to the **Server** menu, then select the **IPMI Configuration** sub-menu. Use this sub-menu to configure the IPMI settings.
3. When finished, press <F10> to save your changes and exit the BIOS setup.

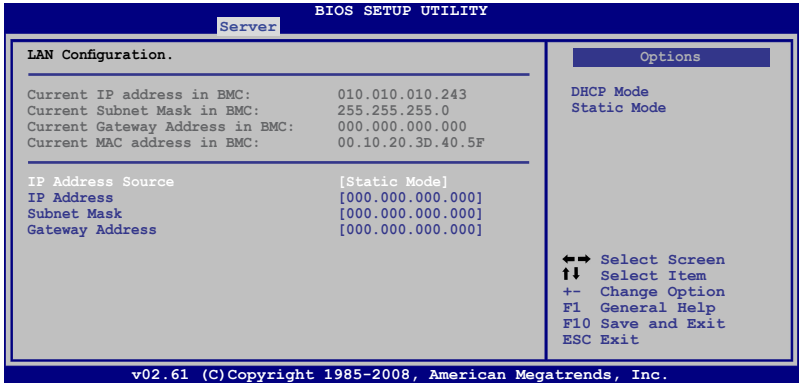
IPMI Configuration



Select **Set LAN1 Configuration** for shared LAN; select **Set LAN3 Configuration** for dedicated LAN.

Set LAN1/LAN3 Configuration

Allows you to set the BMC LAN Parameter settings.



IP Address Source

Allows you to select the IP address source type. When set to [Static Mode], the following three items become configurable, and you have to assign the IP address, subnet mask and gateway address for the remote server. When set to [DHCP Mode], you don't have to assign the IP address, subnet mask and gateway address for the remote server.

IP Address

Allows you to set the BMC IP address.

Subnet Mask

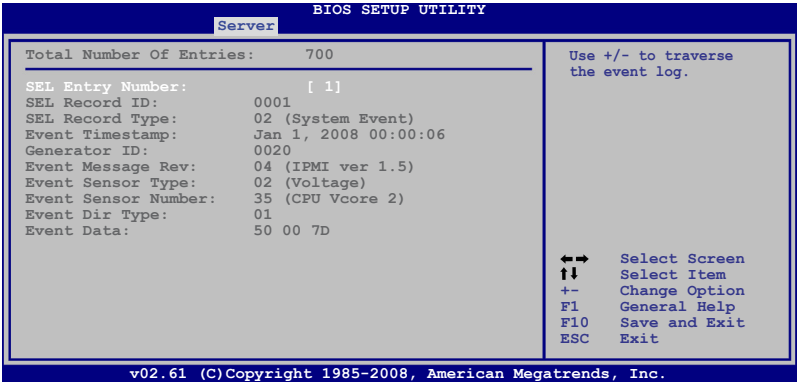
Allows you to set the BMC subnet mask. We recommend that you use the same Subnet Mask you have specified on the operating system network for the used network card.

Gateway Address

Allows you to set the gateway address. We recommend that you use the same gateway address you have specified on the operating system network for the used network card.

View BMC System Event Log

Allows you to view all the events in the BMC event log. It will take a maximum of 15 seconds to read all the BMC SEL records.



Clear BMC System Event Log

Allows you to clear the system event log. Press <Enter> to go to the sub screen, and then select **Ok** to clear BMC System Event Log.

BMC Watch Dog Timer Action [Disabled]

Allows the BMC to reset or power down the system when the operating system crashes or hangs. Configuration options: [Disabled] [Reset System] [Power Down] [Power Cycle]

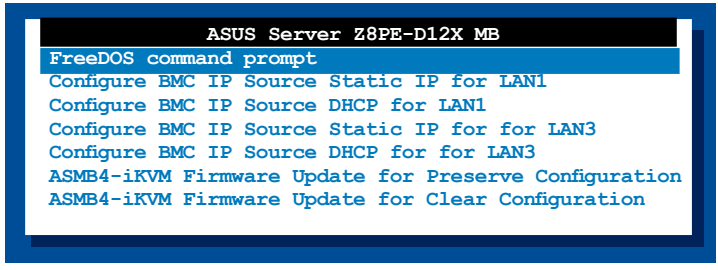
It is necessary to install ASWM (ASUS System Web-based Management) for using this function.

2.5 Running the ASMC4 utility

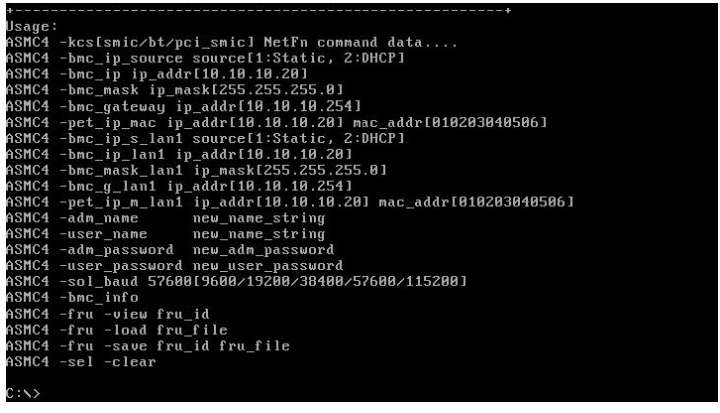
The ASMC4 utility allows you to update the ASMB4-iKVM/ASMB4-SOL PLUS firmware, configure the LAN setting for the remote server and change the user name/ password in DOS environment. This utility is available from the support CD that came with the package.

To run the ASMC4 utility:

1. Insert the support CD into the optical drive.
2. Restart the remote server, then press <Del> during POST to enter the BIOS setup.
3. Go to Boot menu and set the Boot Device Priority item to [CD-ROM].
4. When finished, press <F10> to save your changes and exit the BIOS setup.
5. On reboot, the main menu appears. Select **FreeDOS command prompt**, and then press <Enter> .



6. When the **C:>** prompt appears, type **ASMC4 -?**, then press <Enter> to display the ASMC4 Utility Help Menu. The screen appears as shown.



Refer to the table on the next page for a description of the help menu options.

ASMC4 Help Menu options

Options	Description
-kcs[smic/bt/pci_smic] NetFn command data....	Send IPMI command
-bmc_ip_source source[1: Static, 2: DHCP]	Set the IP source
-bmc_ip [ip_addr] (e.g., bmc_ip 10.10.10.20)	Write the BMC IP address for dedicated LAN
-bmc_mask [ip_mask] (e.g., bmc_mask 255.255.255.0)	Write the subnet mask for dedicated LAN
-bmc_gateway [ip_addr] (e.g., bmc_gateway 10.10.10.254)	Write the gateway address for dedicated LAN
-pet_ip_mac [ip_addr] [mac_addr] (e.g., pet_ip_mac 10.10.10.20 010203040506)	Write the PET destination IP and MAC addresses for dedicated LAN
-bmc_ip_s_lan1 source[1: Static, 2: DHCP]	Set the IP source for shared LAN
-bmc_ip_lan1 [ip_addr] (e.g., bmc_ip 10.10.10.20)	Write the BMC IP address for shared LAN
-bmc_mask_lan1 [ip_mask] (e.g., bmc_mask 255.255.255.0)	Write the subnet mask for shared LAN
-bmc_g_lan1 [ip_addr] (e.g., bmc_gateway 10.10.10.254)	Write the gateway address for shared LAN
-pet_ip_m_lan1 [ip_addr] [mac_addr] (e.g., pet_ip_mac 10.10.10.20 010203040506)	Write the PET destination IP and MAC addresses for shared LAN
-adm_name new_name_string	Change the administration name
-user_name new_name_string	Change the user name
-adm_password new_adm_password	Change the administration password
-user_password new_user_password	Change the user password
-sol_baud [baud rate] (e.g., sol_baud 57600)	Set the communication Baud rate
-bmc_info	Displays the BMC and PET IP and MAC addresses
-fru -view fru_id	Displays the system FRU information
-fru -load fru_file	Update system FRU data from file
-fru -save fru_id fru_file	Save system FRU data to file
-sel -clear	Clear system event log

2.5.1 Configuring the LAN controller

Before you can establish connection to the ASMB4-iKVM/ASMB4-SOL PLUS board, you must configure the LAN port for server management used by the remote server to connect to the local/central server.

To configure the LAN port of the remote server:

1. Run the ASMC4 utility from the support CD following the instructions in the previous section.
2. Set IP source:
   (a) Type asmc4 -bmc_ip_source 1 if you want to set a static IP address.
   (b) Type asmc4 -bmc_ip_source 2 if you want to get IP from DHCP server.
3. Type asmc4 -bmc_ip xxx.xxx.xxx.xxx, then press <Enter> to assign any IP address to the remote server LAN port (if necessary). The screen displays the request and response buffer. Write the remote server IP address in a piece of paper for reference.

```
c:\>asmc4 -bmc_ip  10.10.10.243
Detect MotherBoard     -> (Z8PE-D12X)
Detect KCS Interface
New BMC IP : 10.10.10.243
c:\>
```

   When finished, the utility returns to the DOS prompt.

Make sure that the assigned IP address for both remote and local/central servers are in the same subnet. You can use the network settings utility in your OS to check.

4. Configure your (a) subnet mask and (b) gateway address if necessary.
   (a) Type asmc4 -bmc_mask xxx.xxx.xxx.xxx (your subnet mask encoded in hexadecimal system)
   (b) Type asmc4 -bmc_gateway xxx.xxx.xxx.xxx (your gateway address encoded in hexadecimal system)
5. Restart the remote server, enter the BIOS setup, then boot from the hard disk drive.
6. Adjust the local/central server network settings, if necessary.

2.5.2 Configuring the user name and password

You may change your user name and password from the ASMC4 utility.

To change the user name and password:

1. Follow steps 1-5 on page 2-11.
2. When the **C:>** prompt appears, type **asmc4 -user_name xxxxx**, then press <Enter> to change the user name.

```
C:\>asmc4 -user_name super
Detect MotherBoard     -> (Z8PE-D12X)
Detect KCS Interface

Change User Name to super
C:\>
```

3. Type **asmc4 -user_password xxxxxxxx**, then press <Enter> to change the password.
4. Restart the remote server, enter the BIOS setup, then boot from the hard disk drive.

2.6 Software installation

You can monitor, control, or manage the remote server from the local/central server using the ASUS Remote Console (ARC). The ARC is a web-based application available from the support CD that came with theASMB4-iKVM/ASMB4-SOL PLUS package. You must install the ARC on the local/central server to access the remote server.

Before you install the ARC:

- For SNMP Service: View the Platform Event Trap (PET) information. See page 3-17 for details.
- For Microsoft® ActiveSync: Enable the SMS feature. See page 3-15 for details.

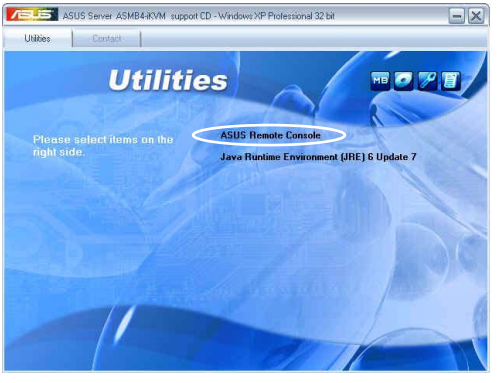
2.6.1 Installing the ARC

To install the ARC to the local/central server:

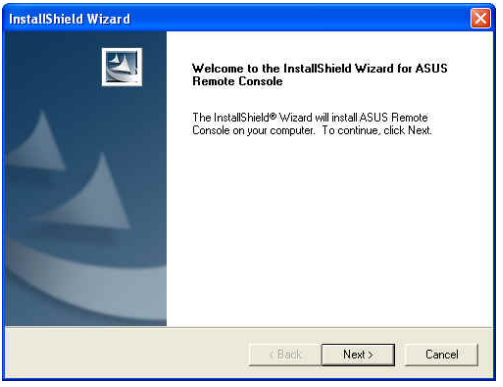
1. Place the support CD to the optical drive. The CD automatically displays the Drivers menu if Autorun is enabled in your computer.

If Autorun is NOT enabled in your computer, browse the contents of the support CD to locate the file ARC.EXE in the ARC folder. Double-click the ARC.EXE to install the application.

2. Click the **Utilities** tab, then click the item **ASUS Remote Console**.

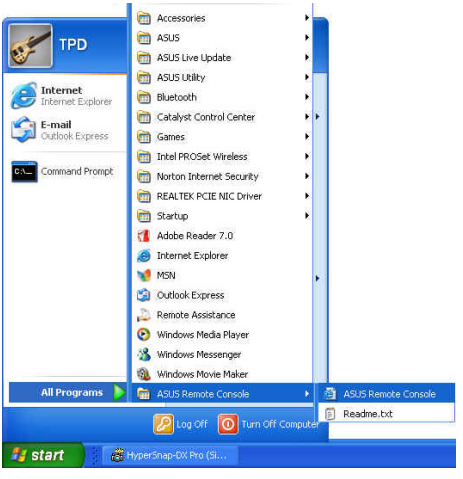


3. Follow the installation wizard instructions to install the utility.



2.6.2 Launching ARC

To launch the ARC utility, click **Start** > **All Programs** > **ASUS Remote Console** > **ASUS Remote Console** from the Windows® desktop.



OR

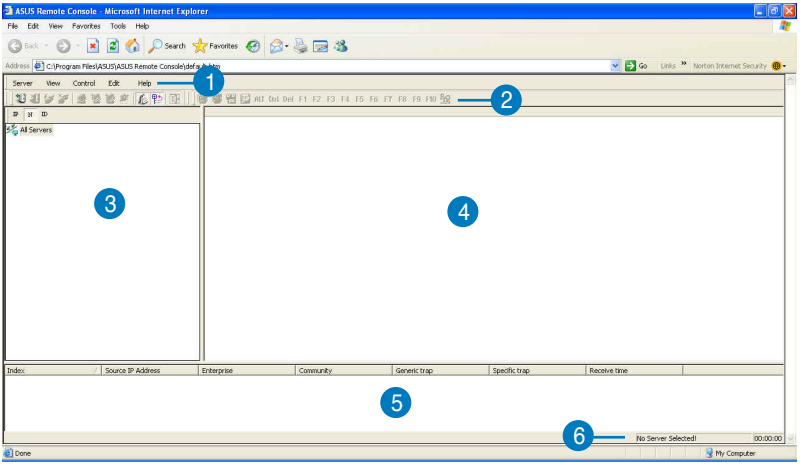
Double-click the ASUS Remote Console icon on the Windows® desktop.

This chapter tells you how to use the ASUS Remote Console (ARC) that the server management board supports.

3 ASUS Remote Console

3.1 ASUS Remote Console (ARC)

The ASUS Remote Console (ARC) is a web-based utility, designed for ASMB4-SOL PLUS, that allows you to monitor the remote host's hardware information including temperatures, fan rotations, voltages, and power. This application also lets you instantly power on/off or reset the remote server.



The ARC window is made up of six sections:

1. Menu bar
2. Tool bar
3. Navigation window
4. Detail/SEL window
5. Event window
6. Status bar

Refer to the following sections for details.

3.1.1 ARC sections

Menu bar

The Menu bar contains all the commands for the ARC application. Click on a menu to display a list of available commands.

Menu	Available commands
Server	add, delete, connect, disconnect server or change the server settings; load/save server node list; general setting; dump/restore all configuration
View	show or hide the tool bar, status bar, navigation, and PET windows
Control	power down/up, reset, power cycle, power on Lan
Edit	delete the System Event Log (SEL), PET log, Reset PET destination, Reset Baud Rate; Set MAC address
Help	open Help contents or view information about the ARC application

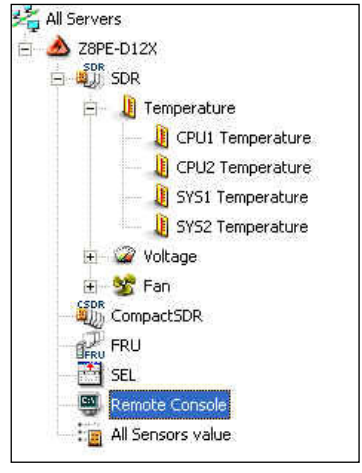
Tool bar

The Tool bar buttons correspond to commonly used commands. The Tool bar offers faster access and execution of these commands. Roll the mouse pointer over a button to display its function.

Navigation window

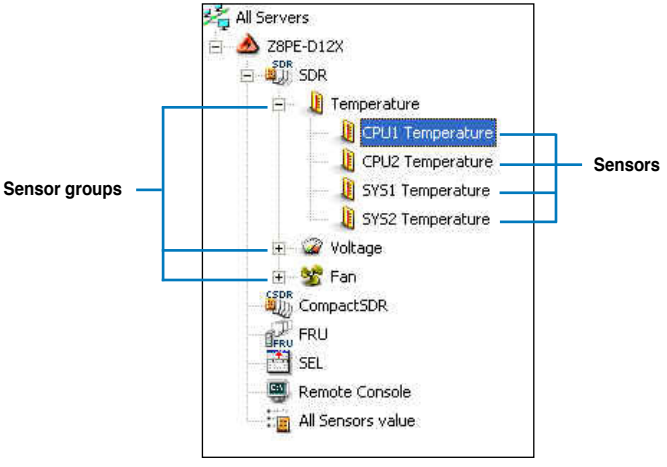
The Navigation window displays the directory of connected and disconnected remote server(s). For multiple monitoring, this window allows you to navigate through the remote servers. Click the **All Servers** root directory to display all connected and disconnected servers, then click on the server you want to monitor or control.

Click ⊞ before the server connection to display available remote server information including the **SDR (Sensor Data Record)**, **FRU (Field Replaceable Unit)**, **SEL (System Event Log)**, and **Remote Console**.

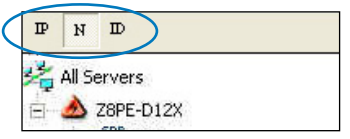


Some remote server information (such as the SDR) contains several sensor groups such as **Temperature**, **Voltage**, and **Fan**. Click ⊞ before the remote server information to display the sensor groups.

Click ⊞ before a sensor group to display individual sensors. For example, clicking ⊞ before the sensor group Temperature displays the CPU1 and system temperatures.

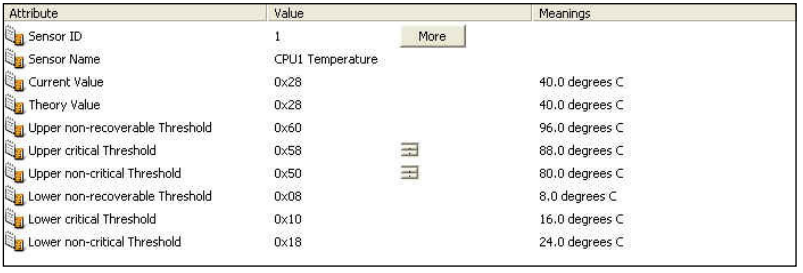


You can also change the server directory display by clicking the buttons on top of the window. For example, clicking the IP button displays the remote server IP address instead of the remote server name (N). Selecting ID displays the remote server ID instead of the server name or IP address.



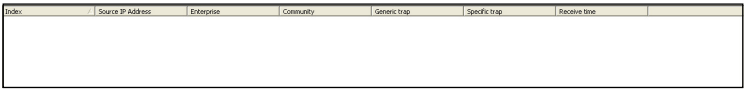
Detail/SEL window

The **Detail/SEL** window displays the detailed SDR and FRU information, and the SEL (System Event Log). The window provides the link for detailed sensor information or system events and allows you to adjust the sensor threshold values.



Event window

The **Event** window displays the Platform Event Trap (PET) received by the ARC. The PET information includes the event index, source IP address, enterprise, community, generic and specific traps, and time ticks. The PET information is a system management alert in SNMP Trap format and is used for IPMI alerting.



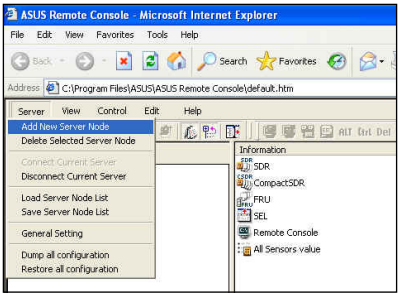
Status bar

The **Status** bar located at the bottom of the ARC window displays the connection status to the remote server, connection duration, IP address of the remote server, and the progress of SDR/SEL/FRU information download.

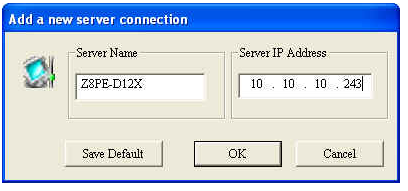
3.1.2 Connecting to the remote server

To connect to the remote server:

1. From the menu bar, click **Server**, then select **Add New Server Node**. An **Add new server connection** window appears.

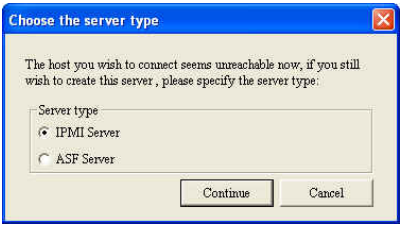


2. Type the remote server name and IP address on the fields. Click **Save Default** to set the remote server connection as the default. Otherwise, click **OK** to continue or **Cancel** to close the window.

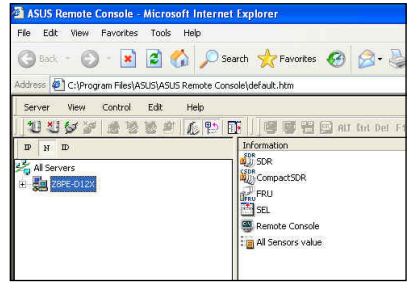


The default server connection name and IP address are automatically displayed everytime you add a new server connection.

3. When prompted, select **IPMI Server**, then click **Continue**.



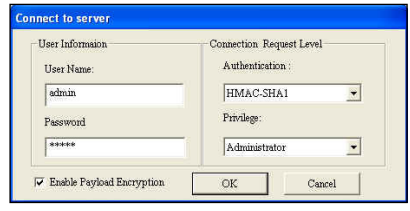
The navigation window displays the remote server. The available remote server information are displayed on the **Detail/SEL** window.



4. Use any of these options to connect to the server:

- Click ⊞ before the remote server to display the remote server information, then select from the list.
- Double-click a remote server information from the **Detail/SEL** window.
- Click **Server**, then select **Connect**.

5. When prompted, enter the default user name (admin) and password (admin).
6. Set the connection request level authentication and privilege, then click **OK**.



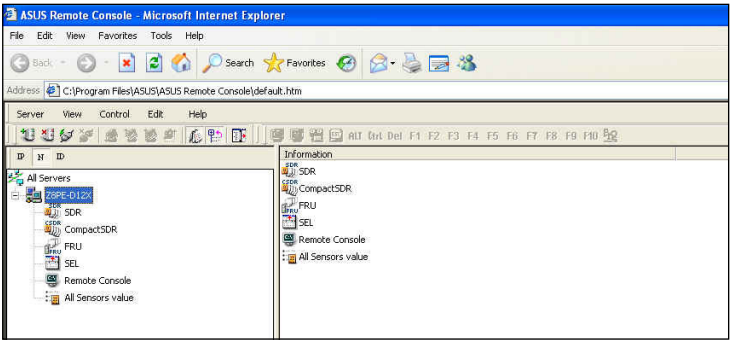
- The default connection request level authentication is HMAC-SHA1 with Administrator privileges. You may change these configuration according to your network settings or preference.
- Check the box before **Enable Payload Encryption** if you want to use Advanced Encryption Standard (AES).

3.1.3 Retrieving sensor information

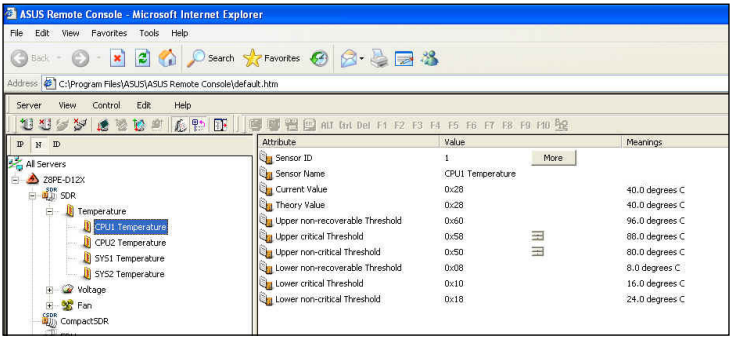
The Sensor Data Record (SDR) provides remote server system information through available sensors including CPU/system/power temperatures, voltages, fan speeds, chassis intrusion, etc. The SDR also provides information on the sensor location (e.g. CPU1, CPU2, FAN1), event generation, and access information.

To retrieve a sensor information:

1. From the navigation window, click ⊞ before the server name to display the remote server information.



2. Click ⊞ before the **SDR** to display the sensor groups (e.g. Temperature), then click ⊞ before a sensor group to display the individual sensors. Select a sensor (e.g. CPU1 Temperature) to display its values in the **Detail/SEL** window.

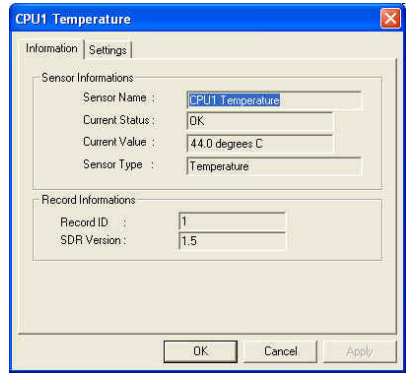


The **Detail/SEL** window displays the sensor data attributes, values, and meanings. From this window, you can adjust the sensor threshold values by clicking the up/down arrow button after each value.

3. Click **More**. A sensor window appears displaying additional information on the sensor.

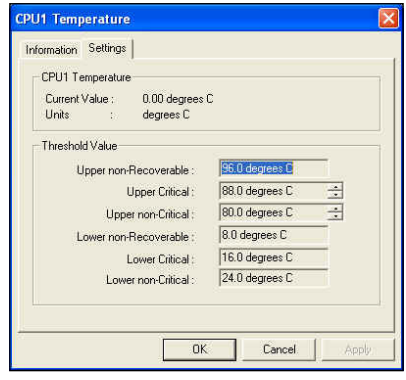
   The Information tab displays basic sensor information including the sensor name, current status, current value, and sensor type.

   The tab also displays the sensor record ID and SDR version.



4. Click the **Settings** tab to adjust the sensor threshold values. Click on the up/down arrow button after each threshold value to adjust.

   Click **OK** to close the window.



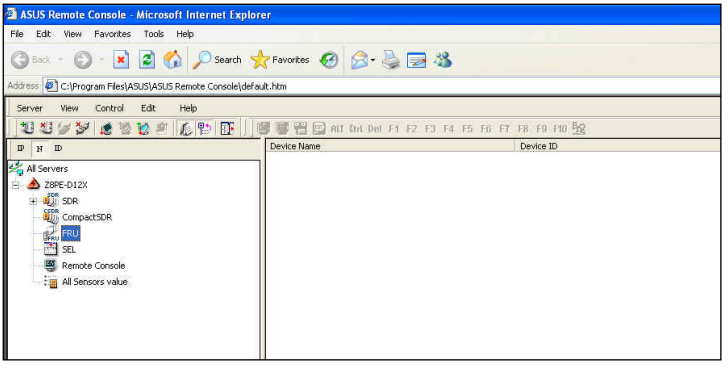
3.1.4 Displaying FRU information

The Field Replaceable Unit (FRU) information provides the manufacturer, product name, and/or serial number of various modules and components installed on the remote server. For example, the FRU feature can display the remote server motherboard name, model, and serial number. You can use this feature when retrieving information on a module or component installed on the remote server.

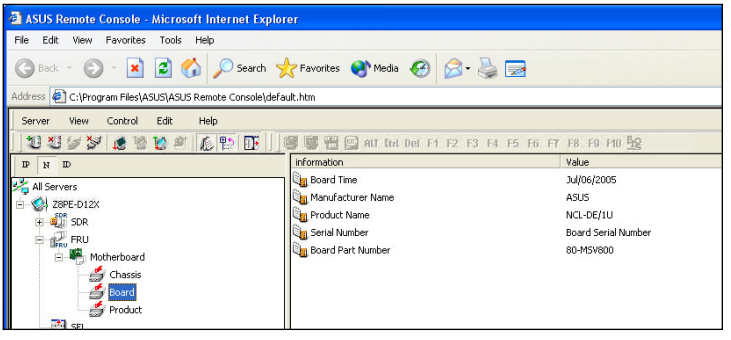
- The FRU information feature allows you to obtain component or module information even when the remote server is down or off.
- The motherboard information is not included in the FRU information.

To display the FRU information:

1. From the navigation window, click ⊞ before the server name to open the remote server information.



2. Click ⊞ before the **FRU** to display available FRU information, then click ⊞ before the module/component. Select a module or component from the list to display the FRU information in the **Detail/SEL** window.

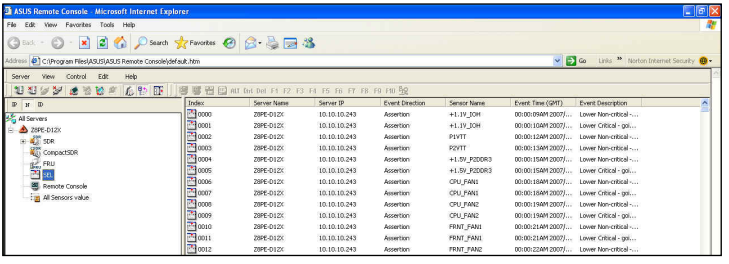


3.1.5 Displaying system event logs

The System Event Log (SEL) is a non-volatile storage area where all remote server system events are stored for real-time tracking or later retrieval. The ARC application can display system events for efficient remote server monitoring and troubleshooting.

To display the sytem events:

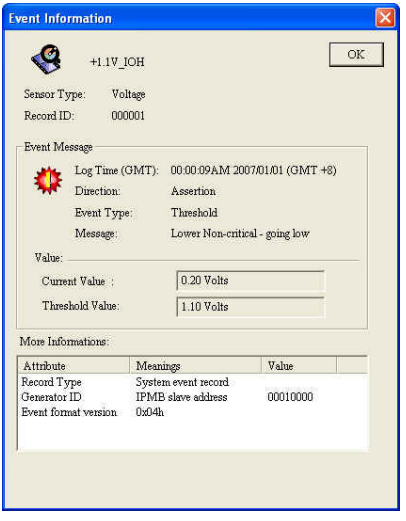
1. From the navigation window, click ⊞ before the server connection, then click **SEL**. The status bar displays the progress of the SEL download. When finished, the **Detail/SEL** window displays the system events in chronological order.



2. Double-click an event to display an **Event Information** window.

   This window displays the sensor type and record ID, event message, current and threshold values, and other system event information.

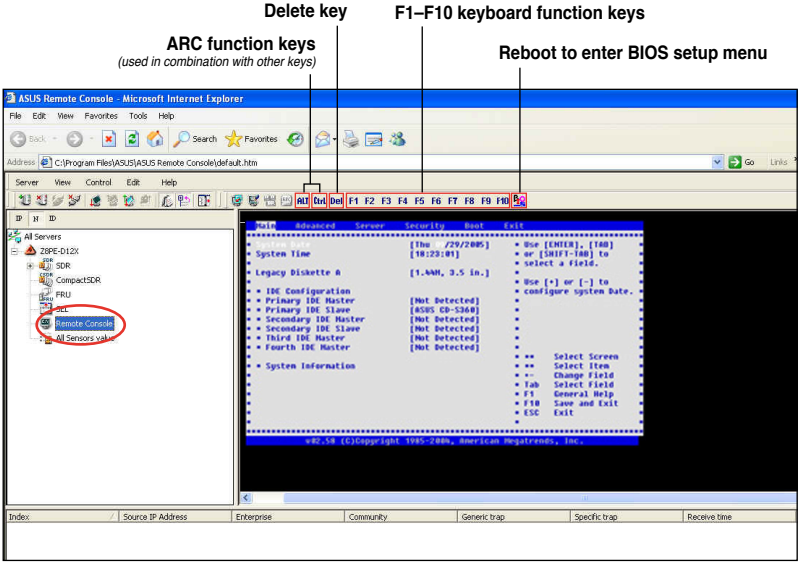
3. Click **OK** to close the window.



3.1.6 Using Remote Console

The Remote Console feature lets you see the remote server screen (text only) and is useful when you adjust the remote server BIOS settings.

To display the remote server console, press the **Remote Console** item from the navigation window. The remote server screen appears in the **Detail/SEL** window.

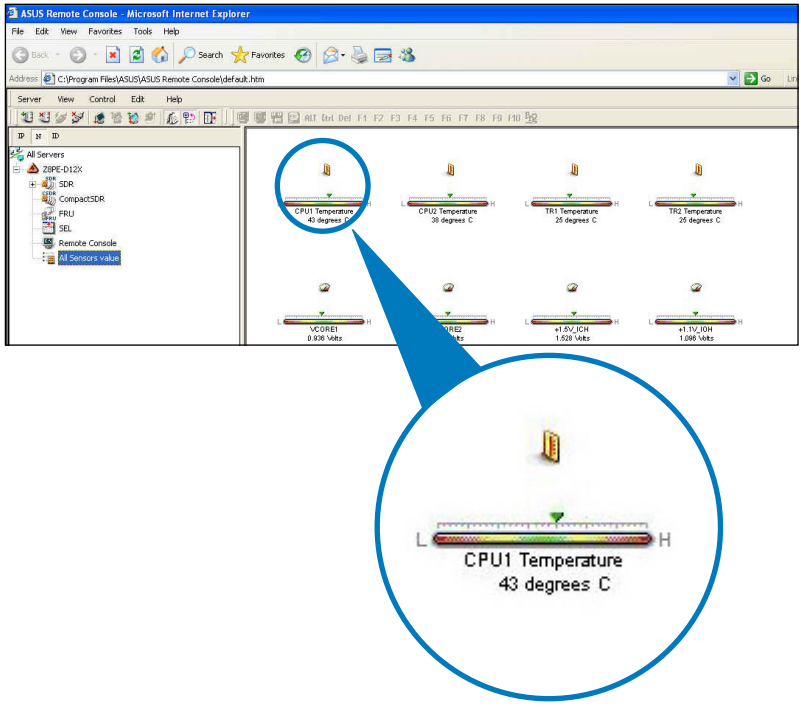


3.1.7 Displaying all remote server sensors

To display all remote server sensors in graphical format:

1. From the navigation window, click ⊞ before the server name to open the remote server information.
2. Click **All Sensors value**. All remote server sensors are displayed on the Information window in graphical format.

   The color bar represents the upper/lower threshold values of each sensor. The green pointer indicates the current value of the sensor.

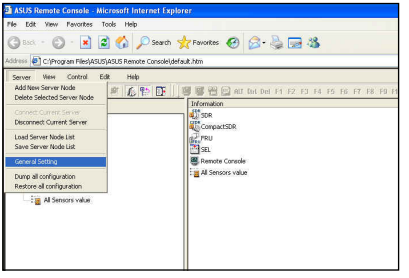


3.1.8 Adjusting the monitoring settings

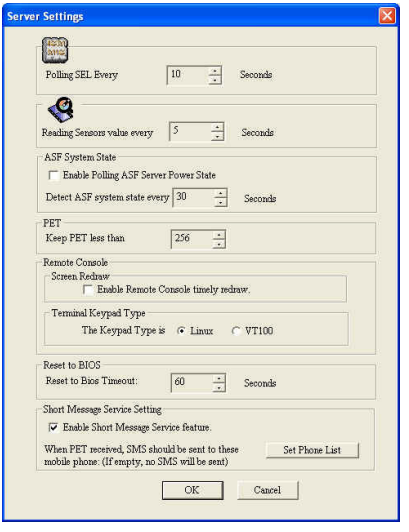
The ARC application allows you to adjust the remote server monitoring settings including SEL polling, SDR reading, and PET.

To adjust the monitoring settings:

1. Click **Server** on the menu bar, then select **General Setting** from the drop-down menu. A **Server Settings** window appears.



2. Click on the up/down arrow button after each setting to adjust the value.
3. Click **OK** to save your changes and close the window; otherwise, click **Cancel** to ignore your changes.



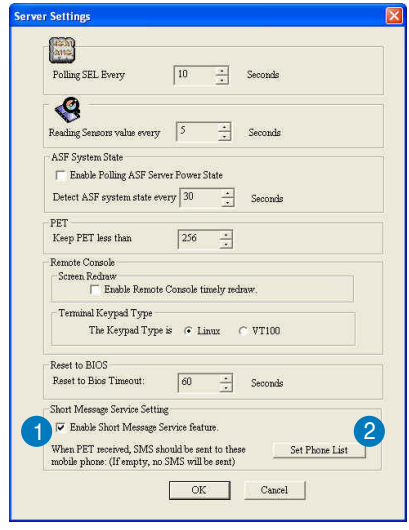
Enabling the Short Message Service (SMS) feature

The Short Message Service or SMS feature allows you to receive Platform Event Trap (PET) information on your smart phone (ASUS P505).

You must install Microsoft® ActiveSync® before you enable the SMS feature. Visit www.microsoft.com to download Microsoft® ActiveSync® .

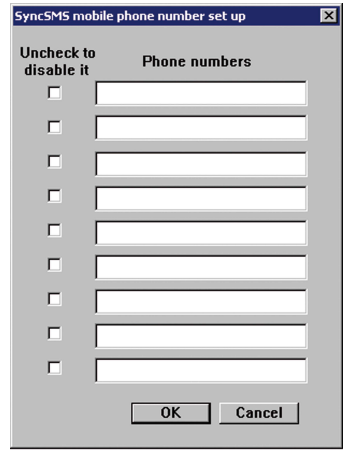
To enable the SMS feature:

1. Check the box before the **Enable Short Message Service** feature.
2. Click **Set Phone List**.



3. When the **SyncSMS mobile phone number setup** window opens, key-in the mobile or PDA phone number in the box.

   You may click the box before each phone number to disable it.
4. Press **OK**.



3.1.9 Controlling the remote server power

ARC allows you to power up, power down, or reset the remote server using the power menu.

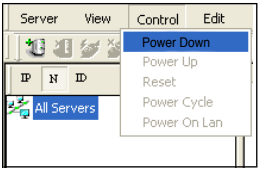
Before turning off or resetting the remote server, make sure that it is not being used and that no application is currently running on it to avoid data loss.

To power down the remote server:

1. Click **Control** on the menu bar, then select **Power down** from the drop-down menu.

   OR

   Click the power down button on the tool bar.



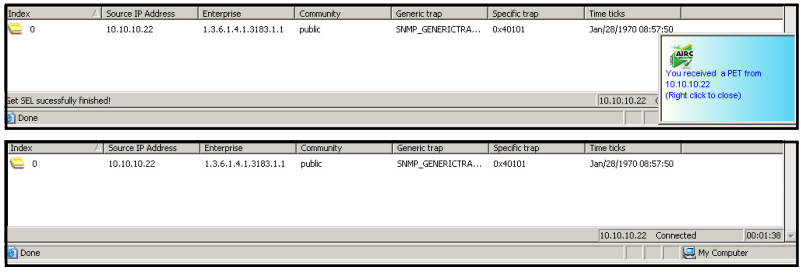
2. Click **Yes** when the Confirm power down window appears.

3. The remote server is turned off. Click **OK** to close the window.

   Use the same instructions as reference when powering up or resetting the remote server.

3.1.10 Viewing PET information

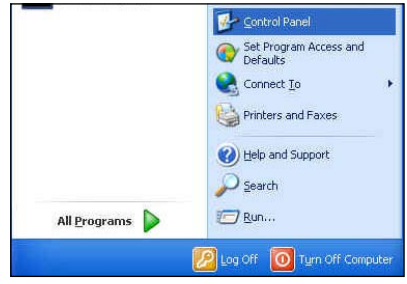
The Platform Event Trap or PET is an SNMP trap used for system management alerts. When the ARC receives a PET, it displays a pop-up window notifying you of the alert and its source (IP address). Right-click the window to close.



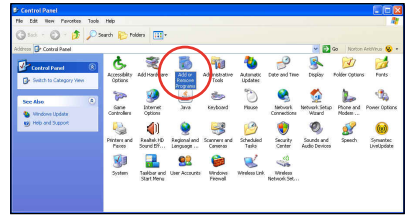
You need to install an SNMP service to the remote server to receive PET information.

To install an SNMP service to the remote service:

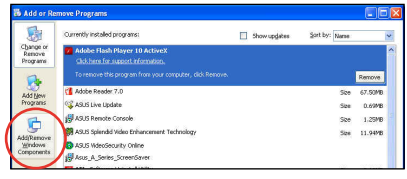
1. On the Windows® taskbar, click **Start > All Programs > Control Panel.**



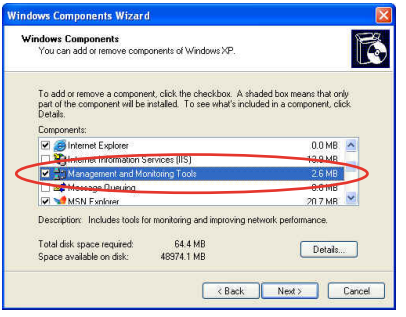
2. Double-click **Add/Remove Programs.**



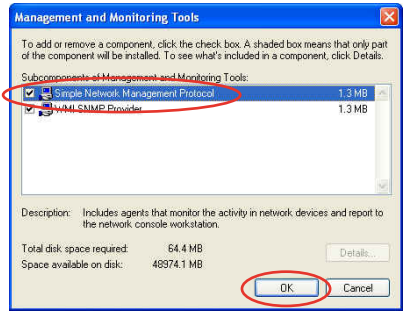
3. Double-click **Add Windows Components.**



4. Double-click **Management and Monitoring Tools**.



5. Select **Simple Network Management Protocol (SNMP).**
6. Click **OK**.



Important notice for Windows® XP (Service Pack 2) users

If the local server system is behind a firewall, you must create a UDP port to receive PET information.

To create a UDP port:

1. Double-click the **My Computer** icon from the Windows® desktop, then click the **My Network Places** link.
2. Click the **View network connections** link, then select the LAN connection the remote server system is using.
3. Right-click the LAN connection, then select **Properties** from the drop-down menu.
4. Click the **Advanced** tab, then click the **Settings** button in the **Network Connection Sharing** area.
5. On the **Services** tab, click the **Add** button to display a **Service Settings** window.
6. Type a name on the **Description of service field** (i.e. ASUS ARC).
7. Type the IP address of the local/central server, then set the **External** and **Internal Port number** to **162**.
8. Select **UDP**, then click **OK**. The created service is displayed in the Services list. Check the box before the service, then click **OK**.

You must also adjust the Internet Explorer settings to allow active contents to run in the local/central server. To do this:

1. From the **Internet Explorer** menu, click **Tools**, then select **Internet Options** from the drop-down menu.
2. Click the **Advanced** tab.
3. Enable the item "**Allow active content to run in files on My Computer**".
4. Click the **Apply** button, then click **OK** to close the window.

3.2 ASUS Host Management Controller Setup

The ASUS Host Management Controller Setup utility provides precise configuration and basic functions including System Event Log (SEL) generation and System Data Record (SDR) reading in DOS mode.

This utility also supplies configuration sequences for the type of host interface as well as direct real-time monitoring of system information including CPU temperature(s), fan speeds and system voltages.

3.2.1 Installing and launching the ASUS Host Management Controller Setup utility

To install the ASUS Host Management Controller Setup utility:

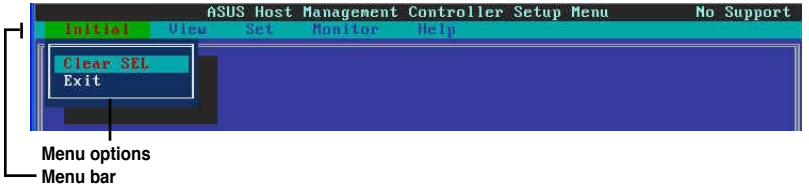
1. Boot the server in DOS mode using the support CD.
2. At the prompt, type **asmc4**, then press <Enter> to display the ASMC4 Utility Help Menu. The screen appears as shown.

```
C:\>asmc4
```

3. The main utility screen appears. Press <Enter>.

3.2.2 Command fields

The utility menu bar has five commands: Initial, View, Set, Monitor and Help. You can select a command using the left or right arrow button on the keyboard. After selecting a command, use the down arrow key to display available options. Select a command, then press <Enter> to execute.

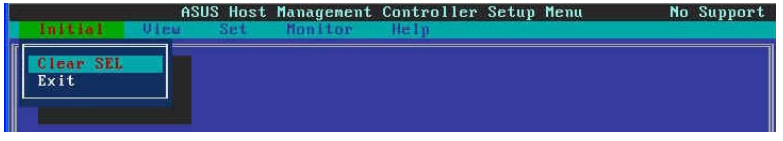


3.2.3 Initial

The Initial command allows you to clear the SEL information or exit the utility.

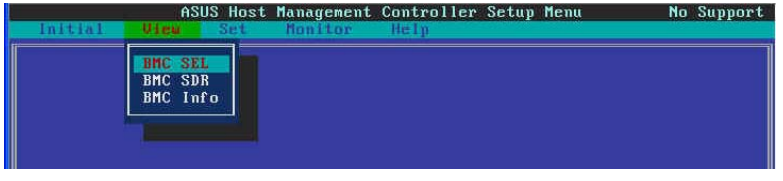
Go to **Initial** command, then select **Clear SEL** to empty all System Event Log information for a refresh set of data records. Use the **Clear SEL** command when creating a new log that begins at an exact time for precise system monitoring.

Select **Exit** to close the utility and return to the DOS prompt.



3.2.4 View

The View command displays the Baseboard Management Controller (BMC) data record including the System Event Log (SEL), the System Data Record (SDR), and general BMC information.

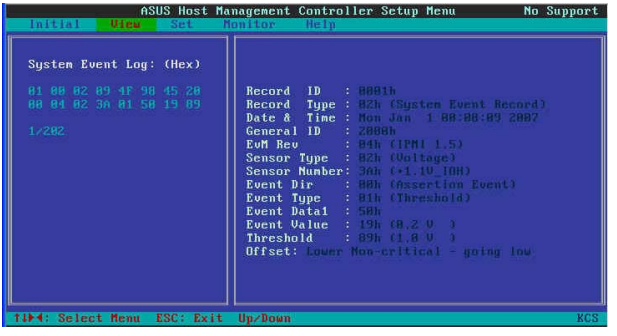


To view the System Event Log (SEL):

1. Select **BMC SEL** from the **View** command option, then press <Enter>. A complete list of system event records appear on the left pane. The right pane displaies the SEL information.

   The number on the left bottom of the window shows the system event displayed in the right window pane over the total number of system events in the remote host.

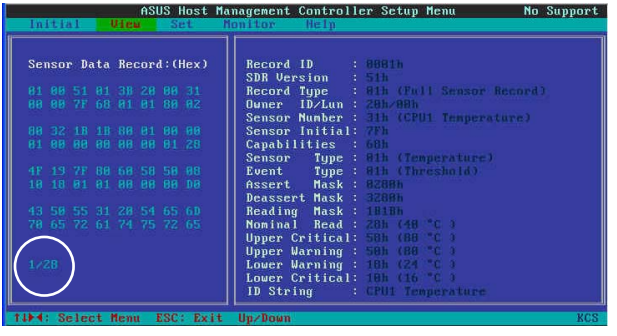
2. Use the down arrow key to display the next sensor event.
3. Press <Esc> to return to the main screen.



To view the System Data Record (SDR):

1. Select **BMC SDR** from the **View** command option, then press <Enter>. A complete list of data records appears on the left pane. The right pane displays the sensor data information.

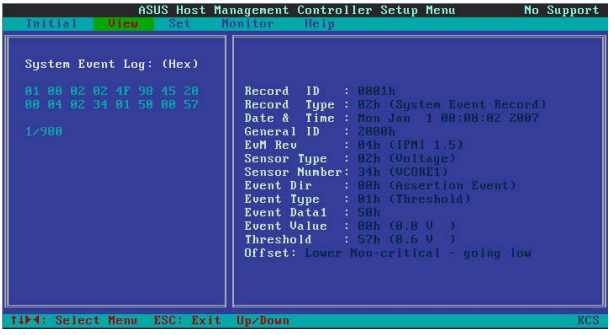
   The number on the bottom left of the screen indicates the data record displayed in the right window pane over the total number of sensor data records in the remote host.



2. Use the down arrow key to display the next sensor data record.
3. Press <Esc> to return to the main screen.

To view the BMC information:

1. Select **BMC Info** from the **View** command option, then press <Enter>. A list of BMC information appears on the left pane.
2. Use the down arrow button to select a BMC information. The BMC information is displayed in the right pane.



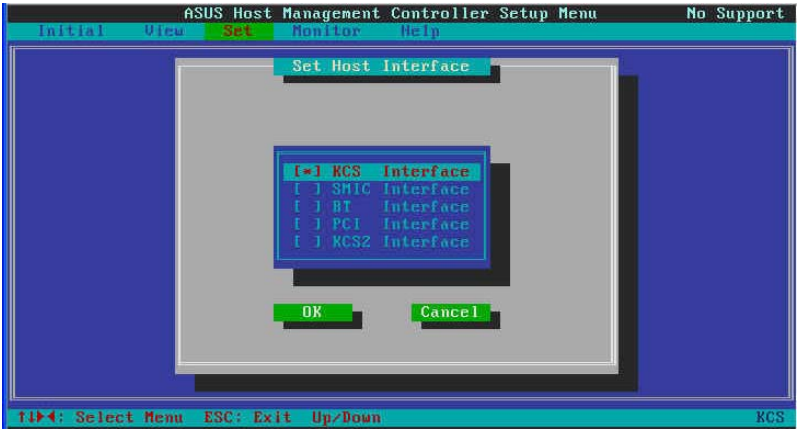
3. Press <Esc> to return to the main screen.

3.2.5 Set

The **Set** command controls the host interface type and the correct BMC time.

To select the host interface:

1. Select **Host Interface** from the **Set** command option, then press <Enter>. The screen displays the host interfaces supported by the server management board.
2. Use the down arrow button to select a host interface, then press <Enter>.



You can select from the following interfaces:

KCS Interface - Keyboard Controller Style
SMIC Interface - Server Management Interface Chip
BT Interface - Block Transfer
PCI Interface - Peripheral Component Interconnect
KCS2 Interface - Keyboard Controller 2 Style

3. When finished, press <Esc> to return to the main screen.

To set the BMC Timer:

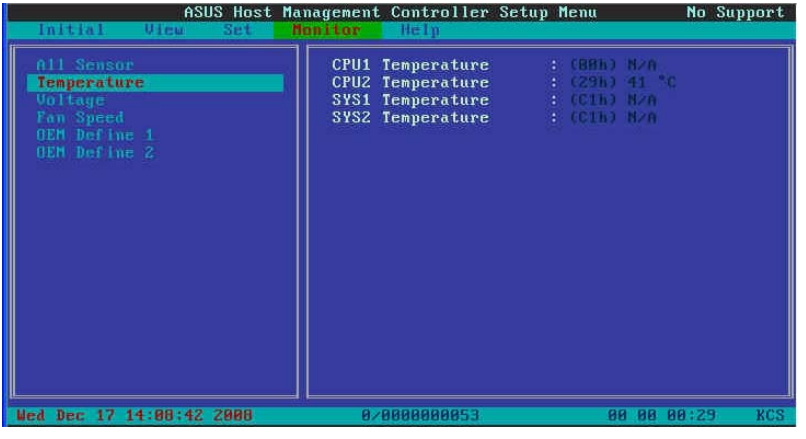
1. Select **BMC Timer** from the **Set** command option, then press <Enter>.
2. Set the BMC IPMI timer to the current system time.
3. When finished, press <Esc> to return to the main screen.

3.2.6 Monitor

The **Monitor** command displays real-time data on the remote server system and CPU temperatures, voltages, and fan speeds.

To display a remote server information:

1. Select a sensor from the **Monitor** command options, then press <Enter>. A list of server information appears on the left pane.
2. Use the down arrow button to select a monitor information. The selected monitor information details are displayed in the right pane.



3. Press <Esc> to return to the main screen.

3.2.7 Help

The **Help** command displays the available utility options, utility version, and copyright information.

This chapter tells you how to use the web-based user interface that the server management board supports.

4 Web-based user interface

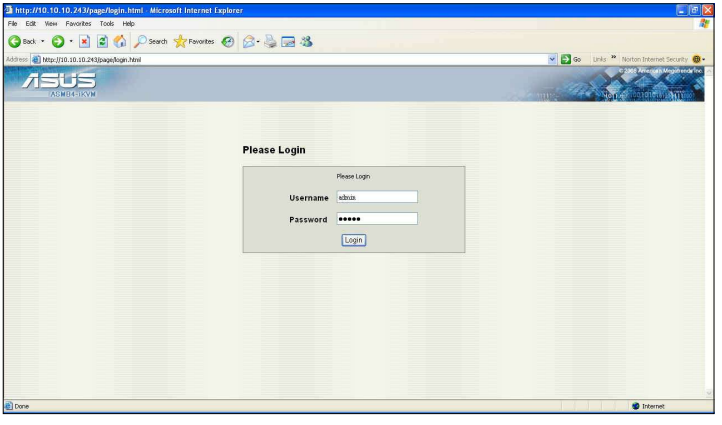
4.1 Web-based user interface

The web-based user interface allows you to easily monitor the remote server's hardware information including temperatures, fan rotations, voltages, and power. This application also lets you instantly power on/off or reset the remote server.

You should install JRE on remote console first before using web-based management. You can find **JRE** from the folder **JAVA** of the ASMB4-iKVM support CD. You can also download JRE from **http://java.sun.com/javase/downloads**.

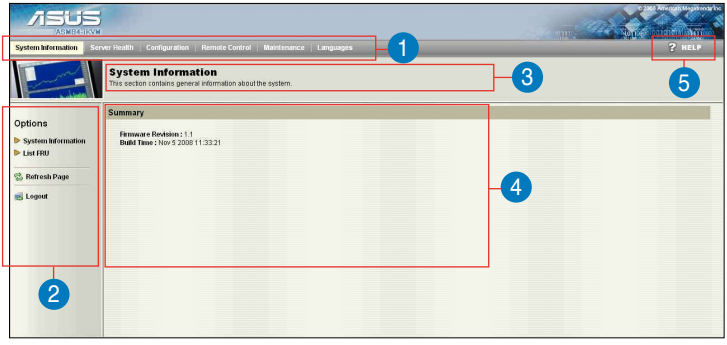
4.1.1 Loging in the utility

1. Ensure that the LAN cable of the computer is connected to the LAN port of the remote server.
2. Open the web browser and type in the same IP address as the one in the remote server.
3. The below screen appears. Enter the default user name (admin) and password (admin). Then click Login.



4.1.2 Using the utility

The web-based graphics user interface displays when you login in the utility successfully.



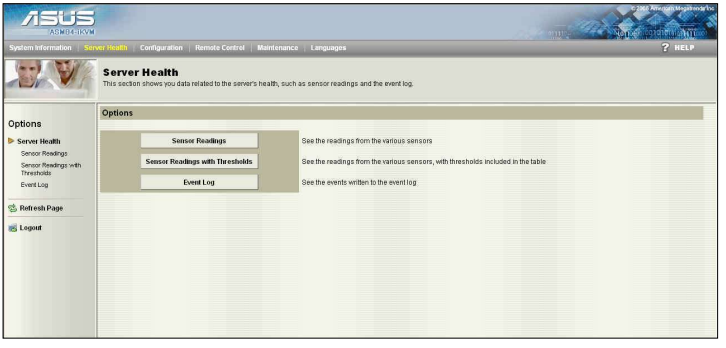
1. **Menu bar:** Click a menu to display available function lists.
2. **Function list:** Click each function key to start using its specific functions.
3. **Function title:** Displays the function title.
4. **Section information:** Displays the section information.
5. **Help menu:** Click to display the brief description of the selected function.

4.2 System Information

This section contains the general information about the system, such as firmware version and detected FRUs.

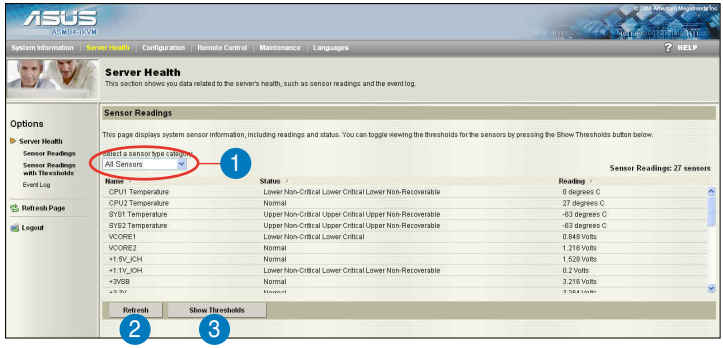
4.3 Server Health

This section contains the data related to the server health, such as the sensor readings and event log. Click each function key to start using its specific functions



4.3.1 Sensor Readings (with Thresholds)

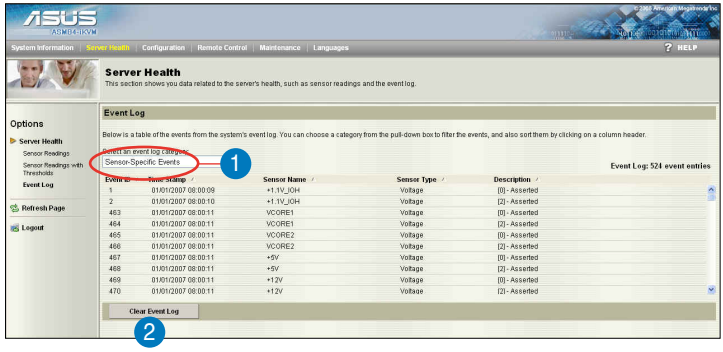
The Sensor Readings page displays the system sensor information, including readings and status.



1. **Select a sensor type category:** Allows you to select the type of sensor readings to be displayed in the list.
2. **Refresh:** Click to refresh the sensor readings.
3. **Show/Hide Thresholds:** Click to display/hide the thresholds assigned to each sensor.

4.3.2 Event Log

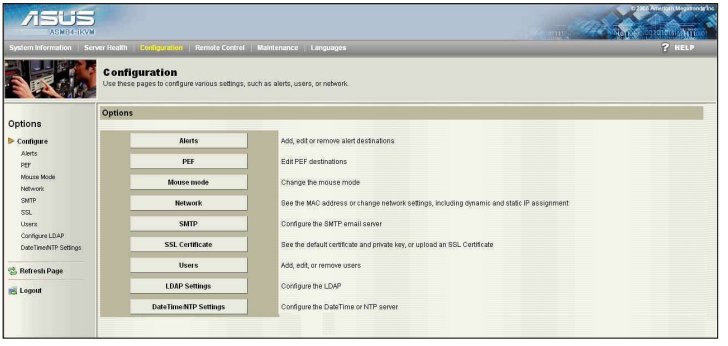
The Event Log page displays a table of system event log.



1. **Select an event log category:** Allows you to select the type of events to be displayed in the list.
2. **Refresh:** Click to clear the event log.

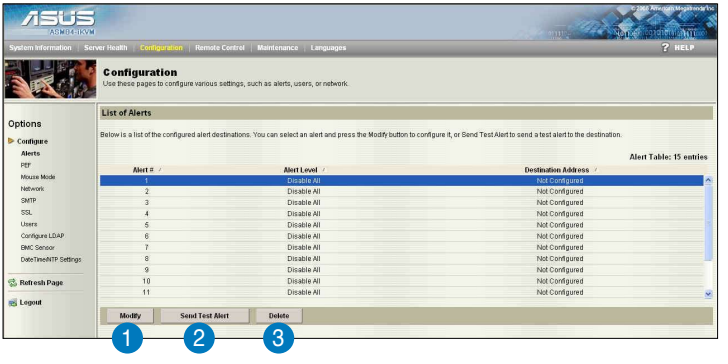
4.4 Configuration

This section allows you to configure the system settings. Click each function key to start using its specific functions



4.4.1 Alerts

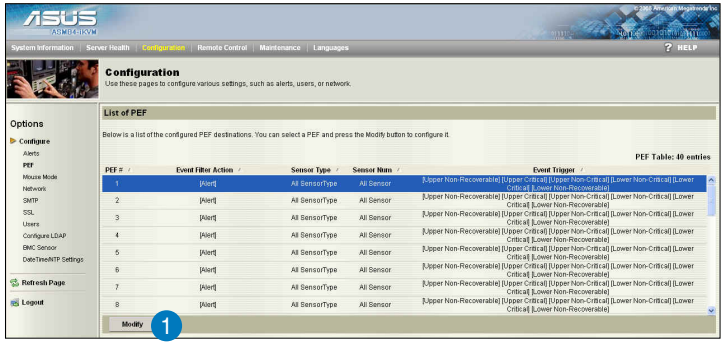
The Alert page allows you to configure the alert settings. Click to select the alert item that you want to modify, delete or send a test alert.



1. **Modify:** Click Modify button to redirect the alert modification page.
2. **Send Test Alert:** Click to send a test alert to the set-up destination.
3. **Delete:** Click to delete the selected test alert.

4.4.2 PEF

The PEF page allows you to modify the PEF configuration.



1. **Modify:** Click to select the PEF item that you want to modify. Click Modify button to redirect the PEF modification page.

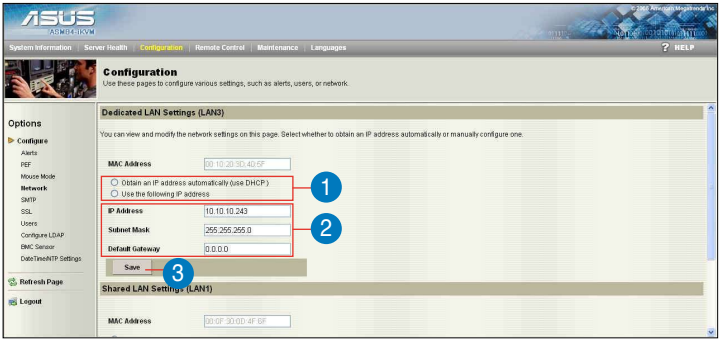
4.4.3 Mouse Mode

The Mouse Mode page allows you to select the mouse mode.

1. **Save:** Select the desired mouse mode, and then click **Save** to apply the setting.

4.4.4 Network

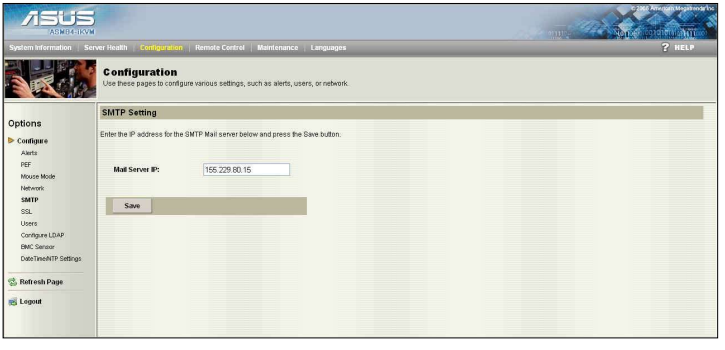
The Network page allows you to configure the network settings.



1. **MAC Address:** Select whether to obtain the IP address automatically or manually configure one.
2. **IP Address/Subnet Mask/Default Gateway:** If you configure a static IP, enter the requested address, subnet mask and gateway in the given field.
3. **Save:** Click to apply the settings.

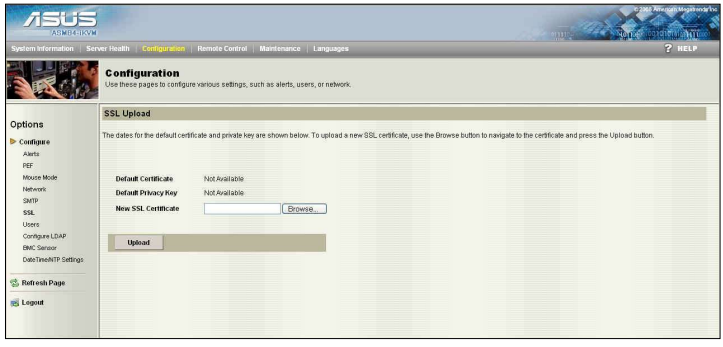
4.4.5 SMTP

The SMTP page allows you to configure SMTP mail server. Enter the IP address of the mail server, and then click **Save** to apply the settings.



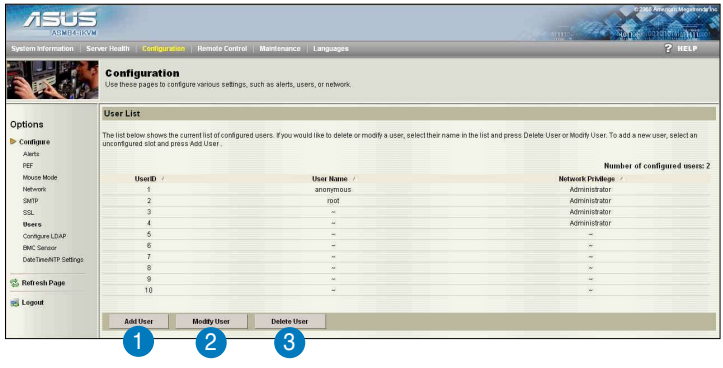
4.4.6 SSL

The SSL page displays the default certificate and private key, and allows you to upload the new SSL certificate. Click **Browse** to navigate the available certificate, and the click **Upload** to upload a new SSL certificate.



4.4.7 Users

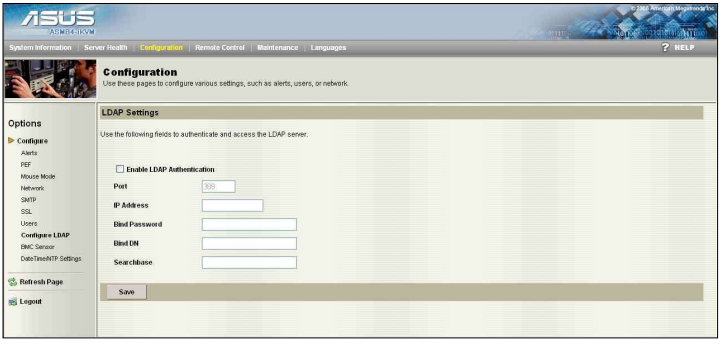
The Users page allows you to configure the user settings and its privilege for this server.



1. **Add User:** Select an empty item, and then click this button to add a new user. The user name should be at least 4 characters; the password should be at least 8 characters.
2. **Modify User:** Select a user in the list, and then click this button to modify the settings.
3. **Delete User:** Select a user in the list, and then click this button to delete the user.

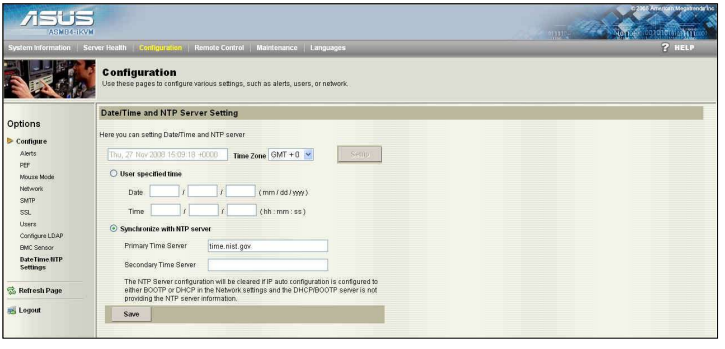
4.4.8 Configure LDAP

The Configure LDAP page allows you to authenticate and access the LDAP server. Complete the settings in the given field, and then click **Save** to apply the settings.



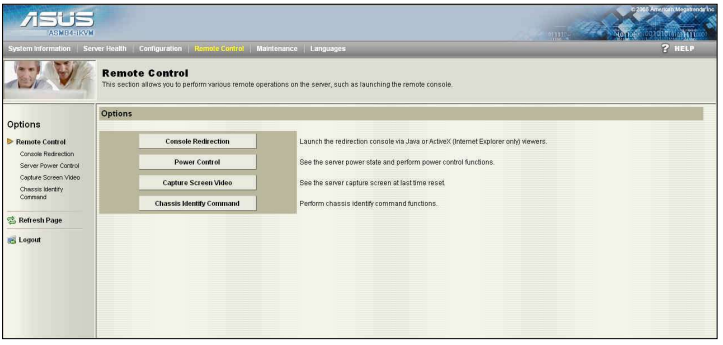
4.4.9 Date/Time/NTP Settings

The Date/Time/NTP Settings page allows you to set up specific date/time or synchronize the date/time with NTP server.



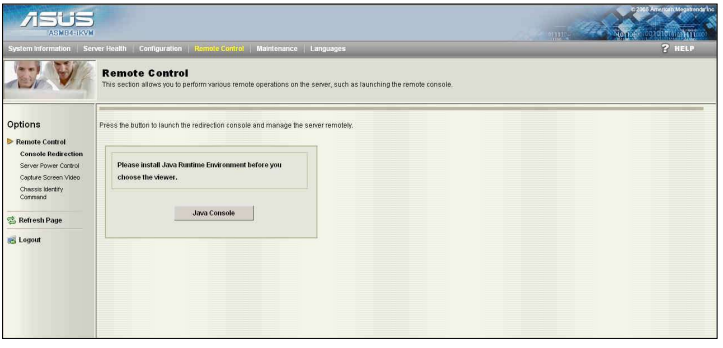
4.5 Remote Control

This section allows you to perform remote operations on the server. Click each function key to start using its specific functions



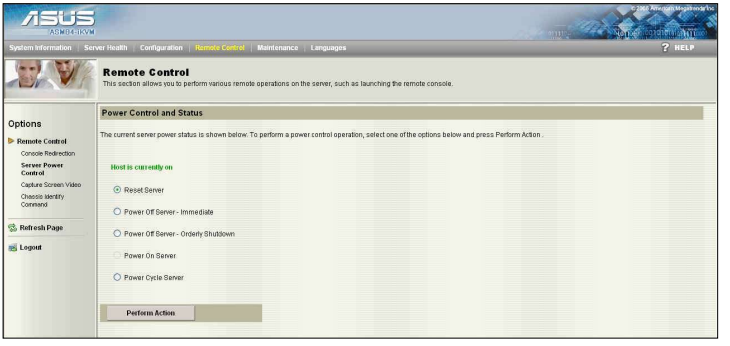
4.5.1 Console Redirection

The Console Redirection page allows you to launch the redirection console and manage the server remotely. Click **Java Console** to open the java redirection window.



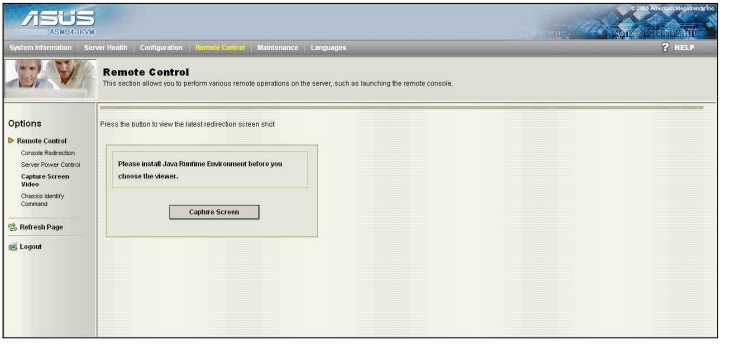
4.5.2 Server Power Control

The Server Power Control page displays the current server power status and allows you to change the current settings. Select the desired option, and then click **Perform Action** to execute the selected action.



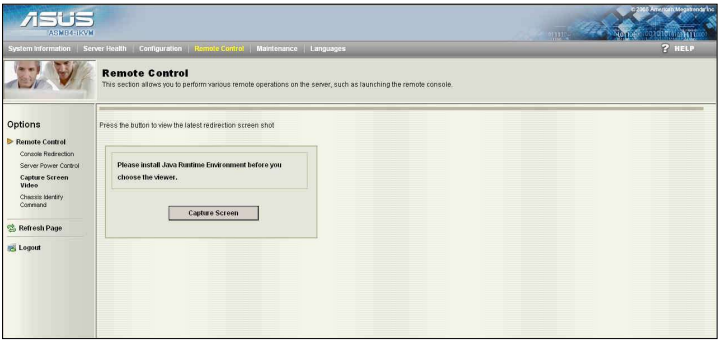
4.5.3 Capture Screen Video

The Capture Screen Video page allows you to view the latest redirection screenshot. Click **Capture Screen** to view the screen capture data.



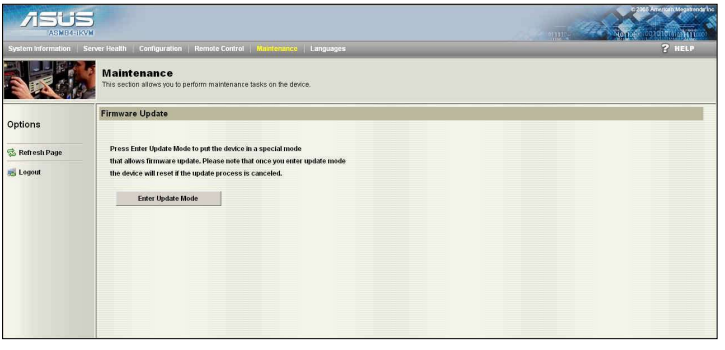
4.5.4 Chassis Identify Command

The Chassis Identify Command page allows you to perform a chassis identify command control operation. Enter identify interval in seconds, and then click **Perform Action** to start the command.



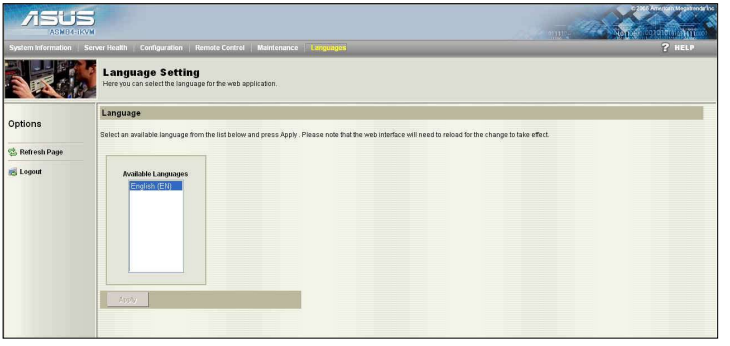
4.6 Maintenance

This section allows you to perform the firmware update for the remote server. Click **Enter Update Mode** to open the firmware update window.



4.7 Languages

This section allows you to select the language for the web-based application. Select the available language from the list, and then click **Apply** to perform the setting.



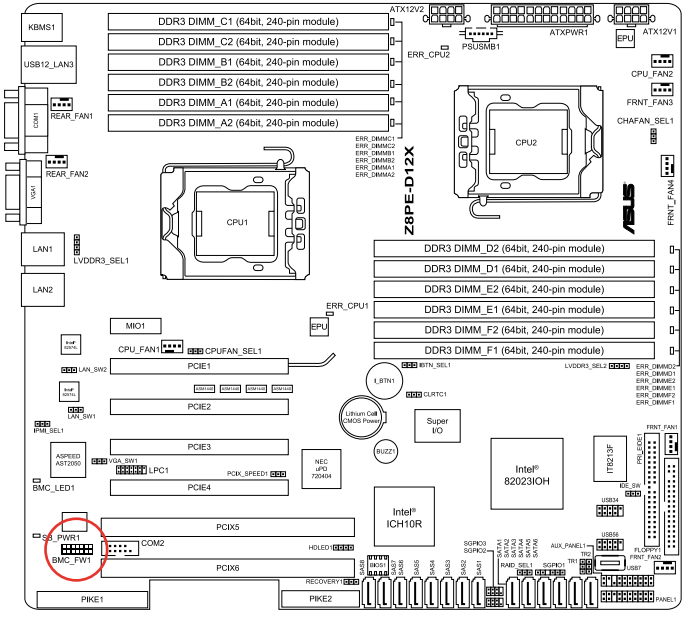
The Appendix shows the location of the LAN ports for server management and BMC connector on server motherboards. This section also presents common problems that you may encounter when installing or using the server management board.

A Reference information

A.1 BMC connector

The ASUS server motherboards that support the ASMB4-iKVM/ASMB4-SOL PLUS comes with a Baseboard Management Controller (BMC) connector.

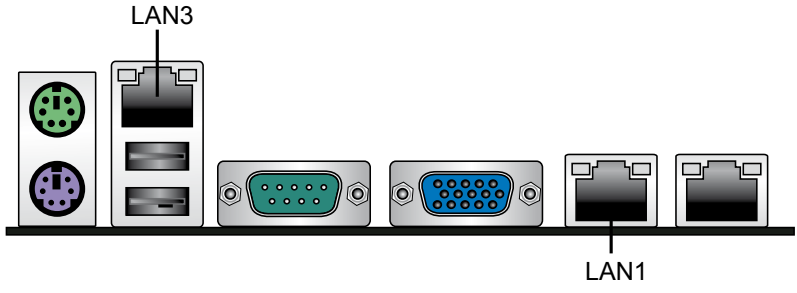
Refer to the illustration below to locate the BMC connector on different server motherboards.



A.2 LAN ports for server management

The ASUS server motherboards that support the ASMB4-iKVM/ASMB4-SOL PLUS comes with three LAN (RJ-45) ports: one for network connection and the other two for server management. For easy identification, the LAN ports for server management are LAN1 and LAN3 ports. You must use the LAN1 and LAN3 ports for server management to connect the remote server to the local/central host (direct LAN connection) or to the network hub or router.

Refer to the illustration below to identify the LAN1 and LAN3 ports for server management on some server motherboards.



You may refer to motherboard manual for the location of LAN1 and LAN3 ports.

A.3 Troubleshooting

This troubleshooting guide provides answers to some common problems that you may encounter while installing and/or using ASUS ASMB4-iKVM/ASMB4-SOL PLUS. These problems require simple troubleshooting that you can perform by yourself. Contact the Technical Support if you encounter problems not mentioned in this section.

Problem	Solution
The local/central server cannot connect to the ASMB4-iKVM/ASMB4-SOL PLUS board	1. Check if the LAN cable is connected to the LAN port. 2. Make sure that the IP address of both the remote and local/central servers are on the same subnet. (Refer to chapter 2 for details.) Try “ping xx.xx.xx.xx” (remote server ip) on local/central server and make sure remote server could reply the ping request. 3. Check if the IP source is set to [DHCP]. When set to [DHCP], you’ll not be able to configure the IP address.
All the SEL (System Event Log) cannot be displayed	The maximum SEL number is 900 events.
The date/time shown in SEL (System Event Log) screen is incorrect	Refer to section 4.4.9 to check if the time zone is set up correctly.
ASMB4-iKVM/ASMB4-SOL PLUS has network connection problems in Firewall environment	Ask MIS to add the following port numbers in Firewall: 5123 (virtual floppy) (TCP) 5120 (virtual CDROM) (TCP) 623 (IPMI) (TCP & UDP) 80 (HTTP) (TCP) 7578 (iKVM) (TCP) 443 (HTTPs) (TCP) 161 (SNMP) (UDP)
The Java redirection screen cannot be displayed normally	Click **Refresh Page** button to refresh the redirection screen.

A.4 BMC Sensor Codes Table

Category 1: Memory related

Sensor No.	Sensor Name	Sensor Type	Sensor Type code	Sensor Value or Event Type	Event Data 3
0xD1	CPU1_ECC1	Memory ECC Sensor	0x0C	Discrete(0x6F) 0x01: Correctable ECC 0x02: Uncorrectable ECC 0x40: Presence detected	0x00: DIMM_A1, 0x01: DIMM_A2, 0x02: DIMM_A3, 0x03:DIMM_A4, 0x04: DIMM_B1, 0x05: DIMM_B2, 0x06: DIMM_B3, 0x07: DIMM_B4, 0x08: DIMM_C1, 0x09: DIMM_C2, 0x0A: DIMM_C3, 0x0B: DIMM_C4, 0x0C: DIMM_D1, 0x0D: DIMM_D2, 0x0E: DIMM_D3, 0x0F: DIMM_D4
0xD2	CPU1_ECC2	OEM Memory ECC Sensor (For Intel DP platform only -- ASUS Z8 series server MB; -E6 server system)	0xC1	Discrete(0x6F) 0x01: Read ECC error 0x02: ECC Error occurred on a scrub 0x04: Write Parity Error 0x08: Error in Redundant memory 0x10: Sparing Error 0x20: Memory access out of Range 0x40: Address Parity Error 0x80: Byte Enable Parity	0x00: DIMM_A1, 0x01: DIMM_A2, 0x02: DIMM_A3, 0x03:DIMM_A4, 0x04: DIMM_B1, 0x05: DIMM_B2, 0x06: DIMM_B3, 0x07: DIMM_B4, 0x08: DIMM_C1, 0x09: DIMM_C2, 0x0A: DIMM_C3, 0x0B: DIMM_C4, 0x0C: DIMM_D1, 0x0D: DIMM_D2, 0x0E: DIMM_D3, 0x0F: DIMM_D4
0xD3	CPU2_ECC1	Memory ECC Sensor	0x0C	Discrete(0x6F) 0x01: Correctable ECC 0x02: Uncorrectable ECC 0x40: Presence detected	0x00: DIMM_D1, 0x01: DIMM_D2, 0x02: DIMM_D3, 0x03: DIMM_D4, 0x04: DIMM_E1, 0x05:DIMM_E2, 0x06: DIMM_E3, 0x07: DIMM_E4, 0x08: DIMM_F1, 0x09: DIMM_F2, 0x0A: DIMM_F3, 0x0B: DIMM_F4, 0x0C: DIMM_G1, 0x0D: DIMM_G2, 0x0E: DIMM_G3, 0x0F: DMM_G4, 0x10: DIMM_H1, 0x11: DIMM_H2, 0x12: DIMM_H3, 0x13: DIMM_H4, 0x14: DIMM_C1, 0x15: DIMM_C2, 0x16: DIMM_C3, 0x17: DIMM_C4
0xD4	CPU2_ECC2	OEM Memory ECC Sensor (For Intel DP platform only -- ASUS Z8 series server MB; -E6 server system)	0xC1	Discrete(0x6F) 0x01: Read ECC error 0x02: ECC Error occurred on a scrub 0x04: Write Parity Error 0x08: Error in Redundant memory 0x10: Sparing Error 0x20: Memory access out of Range 0x40: Address Parity Error 0x80: Byte Enable Parity	0x00: DIMM_D1, 0x01: DIMM_D2, 0x02: DIMM_D3, 0x03: DIMM_D4, 0x04: DIMM_E1, 0x05:DIMM_E2, 0x06: DIMM_E3, 0x07: DIMM_E4, 0x08: DIMM_F1, 0x09: DIMM_F2, 0x0A: DIMM_F3, 0x0B: DIMM_F4, 0x0C: DIMM_G1, 0x0D: DIMM_G2, 0x0E: DIMM_G3, 0x0F: DMM_G4, 0x10: DIMM_H1, 0x11: DIMM_H2, 0x12: DIMM_H3, 0x13: DIMM_H4, 0x14: DIMM_C1, 0x15: DIMM_C2, 0x16: DIMM_C3, 0x17: DIMM_C4

Category 2: HDD / Backplane related

Sensor No.	Sensor Name	Sensor Type	Sensor Type Code	Sensor Value or Event Type
0x68	Backplane1 HD1	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x69	Backplane1 HD2	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x6A	Backplane1 HD3	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x6B	Backplane1 HD4	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x6C	Backplane1 HD5	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x6D	Backplane1 HD6	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x6E	Backplane1 HD7	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x6F	Backplane1 HD8	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x78	Backplane2 HD1	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x79	Backplane2 HD2	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x7A	Backplane2 HD3	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x7B	Backplane2 HD4	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x7C	Backplane2 HD5	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x7D	Backplane2 HD6	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x7E	Backplane2 HD7	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild
0x7F	Backplane2 HD8	Drive Slot	0x0D	Discrete(0x6F) 0x01: Drive Presence 0x02: Drive Fault 0x80: Rebuild

Category 3: Power Supply related

Sensor No.	Sensor Name	Sensor Type	Sensor Type Code	Sensor Value or Event Type
0x81	PSU1 Temp	Temperature	0x01	Threshold(0x01) Upper Non-Critical - going high Upper Critital - going high
0x82	PSU1 Fan1	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0x83	PSU1 Fan2	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0x92	PSU1 Over Temp	Temperature	0x01	Discrete(0x07) 0x01: Transition to OK 0x10: Transition to Non-Critical from more severe 0x40: Transition to Non-Recoverable
0x93	PSU1 FAN Low	FAN	0x04	Discrete(0x07) 0x01: Transition to OK 0x10: Transition to Non-Critical from more severe
0x94	PSU1 AC	Power Supply	0x08	Discrete(0x6F) 0x01: Presence Detected 0x08: Power Supply input lost (AC/DC)
0x95	PSU1 Slow FAN1	FAN	0x04	Discrete(0x07) 0x01: Transition to OK 0x10: Transition to Non-Critical from more severe 0x40: Transition to Non-Recoverable
0x96	PSU1 Slow FAN2	FAN	0x04	Discrete(0x07) 0x01: Transition to OK 0x10: Transition to Non-Critical from more severe 0x40: Transition to Non-Recoverable
0x97	PSU1 PWR Detect	Power Supply	0x08	Discrete(0x6F) 0x01: Presence Detected 0x02: Power Supply Failure Detected
0x84	PSU2 Temp	Temperature	0x01	Threshold(0x01) Upper Non-Critical - going high Upper Critital - going high
0x85	PSU2 Fan1	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0x86	PSU2 Fan2	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0x9A	PSU2 Over Temp	Temperature	0x01	Discrete(0x07) 0x01: Transition to OK 0x10: Transition to Non-Critical from more severe 0x40: Transition to Non-Recoverable
0x9B	PSU2 FAN Low	FAN	0x04	Discrete(0x07) 0x01: Transition to OK 0x10: Transition to Non-Critical from more severe
0x9C	PSU2 AC Lost	Power Supply	0x08	Discrete(0x6F) 0x01: Presence Detected 0x08: Power Supply input lost (AC/DC)
0x9D	PSU2 Slow FAN1	FAN	0x04	Discrete(0x07) 0x01: Transition to OK 0x10: Transition to Non-Critical from more severe 0x40: Transition to Non-Recoverable
0x9E	PSU2 Slow FAN2	FAN	0x04	Discrete(0x07) 0x01: Transition to OK 0x10: Transition to Non-Critical from more severe 0x40: Transition to Non-Recoverable
0x9F	PSU2 PWR Detect	Power Supply	0x08	Discrete(0x6F) 0x01: Presence Detected 0x02: Power Supply Failure Detected

Category 4: Hardware Monitor / System Sensor related

Sensor No.	Sensor Name	Sensor Type	Sensor Type Code	Sensor Value or Event Type
0x31	CPU1 Temperature	Temperature	0x01	Threshold(0x01) Upper Non-critical - going high Upper Critical - going high
0x32	CPU2 Temperature	Temperature	0x01	Threshold(0x01) Upper Non-critical - going high Upper Critical - going high
0xCC	TR1 Temperature	Temperature	0x01	Threshold(0x01) Upper Non-critical - going high Upper Critical - going high
0xCD	TR2 Temperature	Temperature	0x01	Threshold(0x01) Upper Non-critical - going high Upper Critical - going high
0x34	VCORE1	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x35	VCORE2	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x36	+3.3V	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x37	+5V	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x38	+12V	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x39	+1.5V_ICH (For Intel DP platform only -- ASUS Z8 series server MB; -E6 server system)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x3A	+1.1V_IOH (For Intel DP platform only -- ASUS Z8 series server MB; -E6 server system)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x3B	+5VSB	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x3C	VBAT	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x3D	P1VTT (For Intel DP platform only -- ASUS Z8 series server MB; -E6 server system)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x3E	+1.5V_P1DDR3 (For Intel platform only -- ASUS Z8 series server MB; -E6 server system)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high

0x3F	P2VTT (For Intel DP platform only -- ASUS Z8 series server MB; -E6 server system)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x40	+3.3VSB	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x41	+1.5V_P2DDR3 (For Intel DP platform only -- ASUS Z8 series server MB; -E6 server system)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x42	P1DDR3 (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x42	+1.5V (For Intel UP platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x43	P2DDR3 (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x44	P1_+1.2V (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x45	P2_+1.2V (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x46	P1_VDDNB (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x47	+1.8V (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x48	+1.2V (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x49	+1.1V (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0x4A	VTT (For AMD platform only)	Voltage	0x02	Threshold(0x01) Lower Non-critical - going low Lower Critical - going low Upper Non-critical - going high Upper Critical - going high
0xA0	CPU_FAN1	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xA1	CPU_FAN2	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low

0xA2	FRNT_FAN1	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xA3	FRNT_FAN2	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xA4	FRNT_FAN3	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xA5	FRNT_FAN4	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xA6	REAR_FAN1	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xA7	REAR_FAN2	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xA8	FRNT_FAN5	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xA9	FRNT_FAN6	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0xAA	FRNT_FAN7	FAN	0x04	Threshold(0x01) Lower Non-critical - going low Lower Critital - going low
0x4F	Chassis Intrusion	Physical Security (Chassis Intrusion)	0x05	Discrete(0x6F) 0x01: General Chassis Intrusion 0x02: Drive Bay Intrusion