Digital

Human Machine Interface

Pro-face

PS-3450A /PS-3451A Series

Reference Manual

NOTES

(1)   The copyrights to all programs and manuals included in the "PS-3450A/PS-3451A" (hereinafter referred to as "PS-A") are reserved by the Digital Electronics Corporation. Digital grants the use of PS-A to its users as described in the "Software Operating License Conditions" documentation. Any actions violating the above-mentioned conditions are prohibited by both Japanese and foreign regulations.

(2)   The contents of this manual have been thoroughly inspected. However, if you should find any errors or omissions in this manual, please inform your local PS-A representative of your findings.

(3)   Regardless of article (2), the Digital Electronics Corporation shall not be held responsible for any damages or third party claims resulting from the use of PS-A.

(4)   Differences may occur between the descriptions found in this manual and the actual functioning of PS-A. Therefore, the latest information on PS-A is provided in data files (i.e. Readme.txt files, etc.) and in separate documents. Please consult these sources as well as this manual prior to using the product.

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Information Symbols

This manual uses the following icons:

IMPORTANT	Indicates a warning or a product limitation. Be sure to follow the instructions given with this icon to ensure the safe operation of the PS-A.
NOTE	Contains additional or useful information.
(1) (2)	Indicates steps used to accomplish a given task. Be sure to follow these steps in the order they are written.
*	Indicates useful or important supplemental information.
SEE →	Indicates pages containing related information.

Contents

Setup operation flow

The following shows the flow of the setup operation from the purchase of the PS-A to the completion of the required setup before use.

PS-A with no pre-installed OS

1	Connect peripheral devices and wiring to the PS-A unit. Connect a USB CD/ DVD-ROM drive and a USB keyboard (commercially available).	(SEE→)	*PS-3450A/3451A Hardware Manual* *3 Hardware Installation*

2	Turn the PS-A's power ON.		Set the power switch on the rear of the PS-A to ON.

3	Configure the BIOS settings. In the [Boot] menu, move [USB CD-ROM] to the top of the list. Save the setting and exit the BIOS setting screen.	(SEE→)	*2.1 System Setup Screen Operation (page2-2)* *2.2.5 Boot (page2-28)* *2.2.6 Exit (page2-30)*

4	Insert the OS setup media into the drive. Install the OS by following the messages on the screen.	(SEE→)	*Refer to the manual of the OS to be installed.*

5	Download and install the necessary drivers and utility software.	(SEE→)	*Visit the download page at the Otasuke Pro! site.* URL http://www.pro-face.com/otasuke/ *1.4 PS-A Dedicated Software (page1-12)*

6	Install the necessary application programs.	(SEE→)	*Refer to the manual of the software to be installed.*

7	Install the PS-A unit.		

PS-A with pre-installed OS

1	Connect peripheral devices and wiring to the PS-A unit. Connect a USB keyboard (commercially available).	(SEE→)	*PS-3450A/3451A Hardware Manual* *3 Hardware Installation*

2	Turn the PS-A's power ON.	Set the power switch on the rear of the PS-A to ON.

3	To change the BIOS settings, go to the system setting screen. Skip this step when you use the factory (default) settings.	(SEE→)	*2.1 System Setup Screen Operation (page2-2)*

4	Set up the pre-installed OS.	(SEE→)	*1.3.1 Setting Up OS (page1-6)*

5	Install the PS-A unit.	

IMPORTANT
- After hardware setup is completed, the OS must be used to create partitions and format (initialize) the HDD before any data or applications can be saved to the hard disk drive. For details concerning these procedures, refer to the OS manufacturer's instruction manual.
- Whenever you turn the PS-A unit's power OFF, wait until the internal HDD stops spinning (approximately 5 seconds) before turning the power ON again.
- The PS-A's hard disk is designed for use with the Windows® 2000, Windows® XP. Other operating systems do not support this driver software, etc.

NOTE
- Use of an uninterrupted power supply is recommended to protect your data from accidental power failures.
  An uninterrupted power supply that supports Windows® will give you sufficient time to shut down your system safely by changing into the power supply for the backup in case of a power failure, and can even be set up to automatically shut down your Windows® OS.
  The PS-A unit, however, cannot be used with a 2-Step Inverter Output type uninterrupted power supply. Be sure the unit is a sine-output type power supply. For details, consult your local UPS system dealer.

1 | Setting Up Software

1. Software Configuration
2. Setting Up an HDD with no Pre-installed OS
3. Setting Up an HDD with Pre-installed OS
4. PS-A Dedicated Software

This chapter describes the setting procedures for the PS-A dedicated programs and the setting parameters.
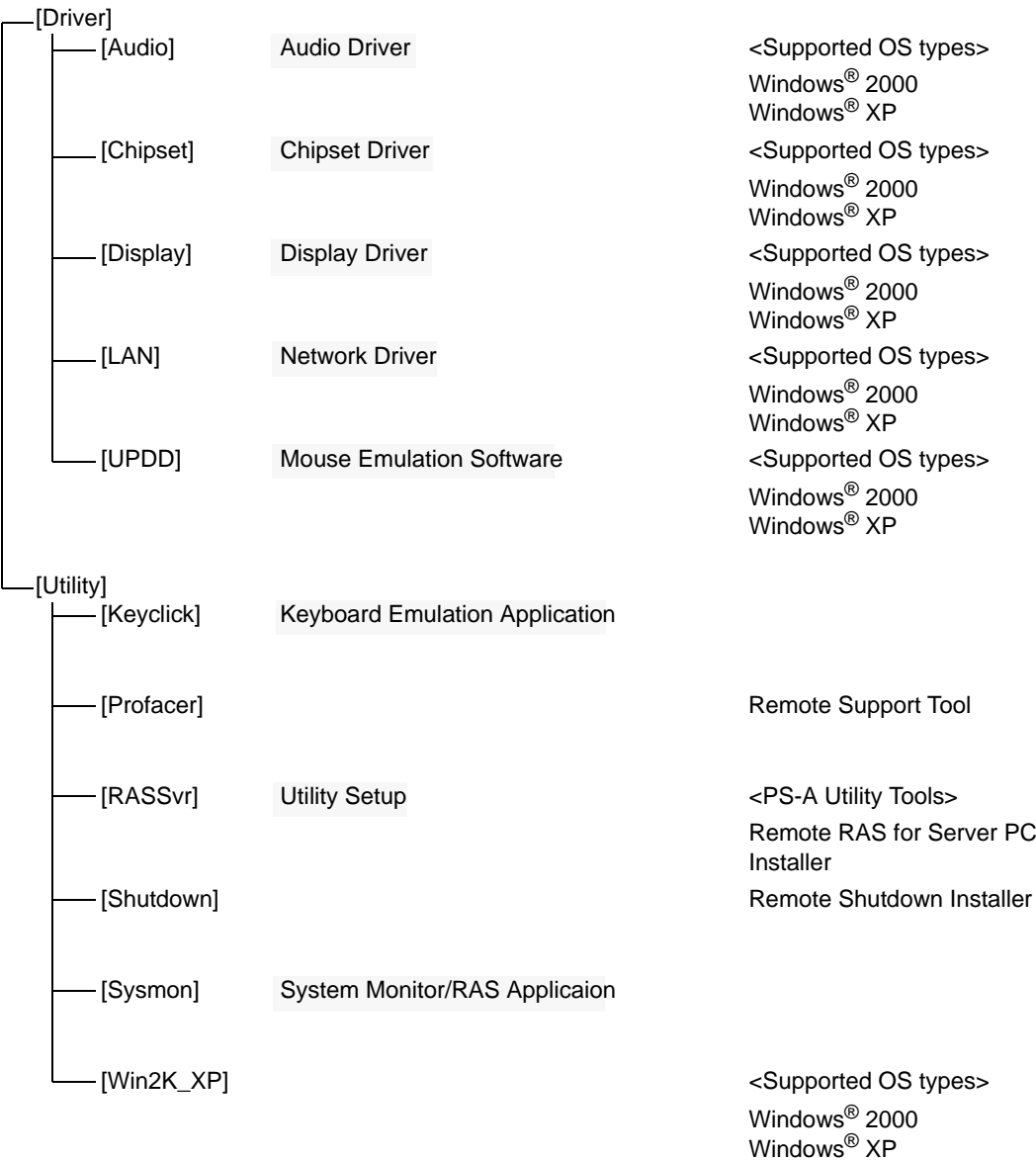
1.1   Software Configuration

The folder composition diagram shown below explains the type of software that can be used with the PS-A.

If you purchased the PS-A unit with pre-installed OS, all the software has been installed already.

If you purchased the PS-A unit with no pre-installed OS, you can download the software from the Pro-face

support site "Otasuke Pro!".

$\boxed{\text{SEE} \rightarrow}$ *1.2.2 Setting Up the PS-A Dedicated Software (page1-3)*

```
[Driver]
    ├── [Audio]      Audio Driver                        <Supported OS types>
    │                                                     Windows® 2000
    │                                                     Windows® XP
    │
    ├── [Chipset]    Chipset Driver                      <Supported OS types>
    │                                                     Windows® 2000
    │                                                     Windows® XP
    │
    ├── [Display]    Display Driver                      <Supported OS types>
    │                                                     Windows® 2000
    │                                                     Windows® XP
    │
    ├── [LAN]        Network Driver                      <Supported OS types>
    │                                                     Windows® 2000
    │                                                     Windows® XP
    │
    └── [UPDD]       Mouse Emulation Software            <Supported OS types>
                                                          Windows® 2000
                                                          Windows® XP

[Utility]
    ├── [Keyclick]   Keyboard Emulation Application
    │
    ├── [Profacer]                                       Remote Support Tool
    │
    ├── [RASSvr]     Utility Setup                       <PS-A Utility Tools>
    │                                                     Remote RAS for Server PC
    │                                                     Installer
    ├── [Shutdown]                                       Remote Shutdown Installer
    │
    ├── [Sysmon]     System Monitor/RAS Applicaion
    │
    └── [Win2K_XP]                                       <Supported OS types>
                                                          Windows® 2000
                                                          Windows® XP
```

1.2 Setting Up an HDD with no Pre-installed OS

First, when you use a PS-A with no pre-installed OS, you will need to install either Windows® 2000 or Windows® XP. You also need to install any required utility software.

1.2.1 Setting Up the OS

Install your operating system. For the setup procedures about the OS, refer to that product's installation manual.

IMPORTANT
- Specify [Disabled] for the USB-Device29 and the Function7 of the BIOS when you install commercial Windows® 2000, using a USB CD/DVD-ROM drive.

  SEE → ◆ *Integrated Device Control Sub-Menu (page2-23)*

- The PS-A unit supports Windows® 2000 Service Pack 4 and Windows® XP Service Pack 2. The PS-A unit performance cannot be guaranteed when any other operating system is used.

1.2.2 Setting Up the PS-A Dedicated Software

(1) Download the necessary drivers and utility software from the Pro-face support site "Otasuke Pro!".

URL http://www.pro-face.com/otasuke/

Click here!

(2) Decompress the downloaded data, then the [Proface] folder has been created in drive C.

NOTE
- The setup requires a USB keyboard.
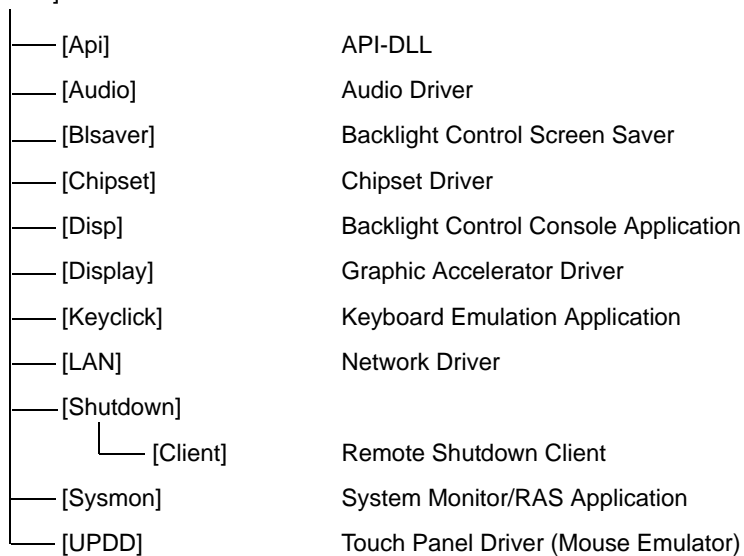- For details about the drivers and utility software, refer to the following section.

  SEE → *1.4 PS-A Dedicated Software (page1-12)*

- When decompressing the Touch Panel Driver (Mouse Emulator) [UPDD], designate the [Proface] folder to save.

■ [Proface] Folder Configuration

The following diagram describes the configuration of this folder. (For all Windows$^{®}$ versions)

[Proface]

—— [Api]	API-DLL
—— [Audio]	Audio Driver
—— [Blsaver]	Backlight Control Screen Saver
—— [Chipset]	Chipset Driver
—— [Disp]	Backlight Control Console Application
—— [Display]	Graphic Accelerator Driver
—— [Keyclick]	Keyboard Emulation Application
—— [LAN]	Network Driver
—— [Shutdown]	
└── [Client]	Remote Shutdown Client
—— [Sysmon]	System Monitor/RAS Application
—— [UPDD]	Touch Panel Driver (Mouse Emulator)

NOTE

• The actual organization may differ from the above depending on your PS-A unit's OS.

• Setting up the PS-A unit's system monitor automatically copies the hardware control driver (Sysmon.sys) to the system folder.

1.3 Setting Up an HDD with Pre-installed OS

In the PS-A with pre-installed OS, the following software has been installed in advance.

■ PS-A with Windows® 2000 Pre-installed

- Windows® 2000 Professional operating system manufactured by Microsoft Corporation

- Mouse Emulation Software manufactured by DMC Co., Ltd. (TSC-1310D/DD)

- Keyclick32 keyboard emulator manufactured by IN-fINITY soft

- PS-A dedicated utility software and drivers manufactured by Pro-face
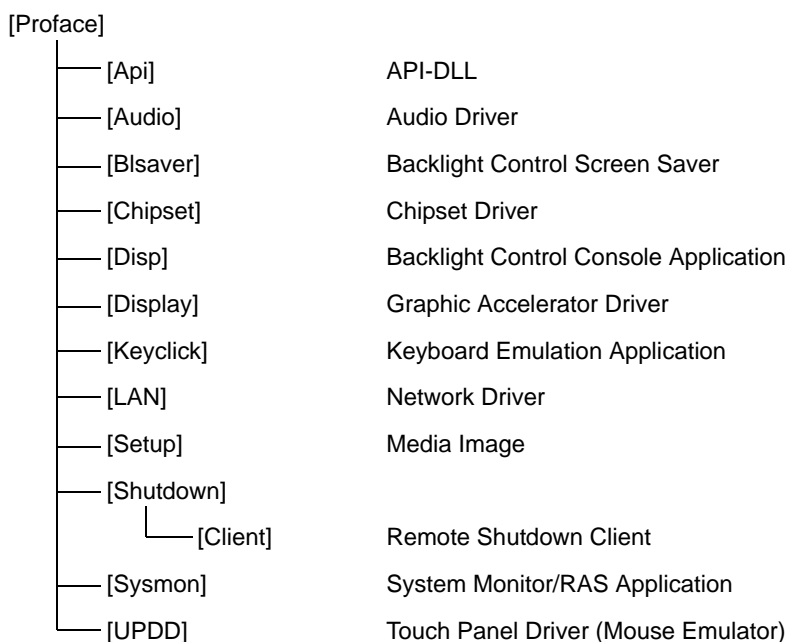
■ PS-A with Windows® XP Pre-installed

- Windows® XP Professional operating system manufactured by Microsoft Corporation

- Mouse Emulation Software manufactured by DMC Co., Ltd. (TSC-1310D/DD)

- Keyclick32 keyboard emulator manufactured by IN-fINITY soft

- PS-A dedicated utility software and drivers manufactured by Pro-face

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NOTE
- Each pre-installed operating system on the hard disk in the PS-A unit is designed specially for PS-3450A/PS-3451A.

- For details about the drivers and utility software, refer to the following section.

  SEE→ *1.4 PS-A Dedicated Software (page1-12)*

■ [Proface] Folder Configuration

A [Proface] folder is prepared on the C drive. The following diagram describes the configuration of this folder.

[Proface]

── [Api]	API-DLL
── [Audio]	Audio Driver
── [Blsaver]	Backlight Control Screen Saver
── [Chipset]	Chipset Driver
── [Disp]	Backlight Control Console Application
── [Display]	Graphic Accelerator Driver
── [Keyclick]	Keyboard Emulation Application
── [LAN]	Network Driver
── [Setup]	Media Image
── [Shutdown]	
└── [Client]	Remote Shutdown Client
── [Sysmon]	System Monitor/RAS Application
── [UPDD]	Touch Panel Driver (Mouse Emulator)

NOTE
- The actual organization may differ from the above depending on your PS-A unit's OS.
- The hardware control driver (Sysmon.sys) is prepared in the system folder on the hard disk of the PS-A unit.

1.3.1 Setting Up OS

Set up the Pre-installed OS in the PS-A unit.

■ Windows® 2000 Setup Procedure

This section describes the setup procedure for Windows® 2000. The setting parameters vary depending on your environment. Ask your network administrator for the appropriate parameters.

NOTE
- The README file stored on the hard disk explains the details of the software and the information provided and changes made after this manual was printed. Be sure to read the file before starting this procedure.
- The OS setup operation requires a keyboard.

(1)   Once the PS-A unit's power is turned ON, this HDD unit's [Windows 2000 Professional Setup] screen, and then the [Welcome to the Windows 2000 Setup Wizard] will appear. Click the [Next] button.
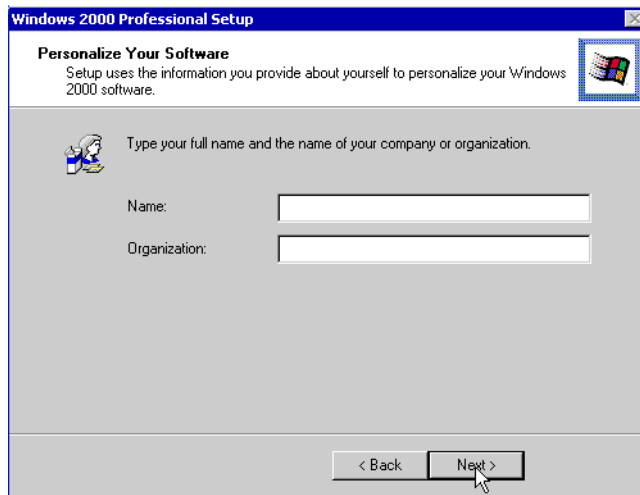

(2)   The [License Agreement] screen will appear.

After reading the contracts, press [I accept this agreement] if you agree, and click the [Next] button.

(3)   The [Regional Settings] screen will appear.

After entering the data for your area, click the [Next] button.
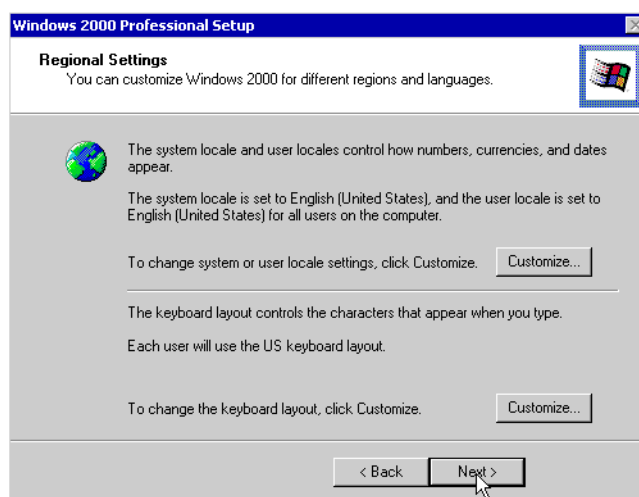
(4)   The [Personalize Your Software] screen will appear.

After entering your name [Name] and [Organization], click the [Next] button.

(5)   The [Your Product key] screen will appear.

After entering the product key data on the license sticker, click the [Next] button.

(6)   The [Computer Name and Administrator Password] screen will appear.

Enter the [Computer Name and Administrator Password], and [Confirm Password], then click the [Next] button.

When entering the [Computer Name], if the name shown on the display is not correct, you can enter another name. When the computer is connected to a network, be sure to ask your network manager what is the correct name for this field.

(7)   The [Date and Time Settings] screen will appear.

After entering these settings, click the [Next] button.

(8)   The [Network Settings] screen will appear.

Choose whether to use typical or custom settings depending on your PC circumstantce.
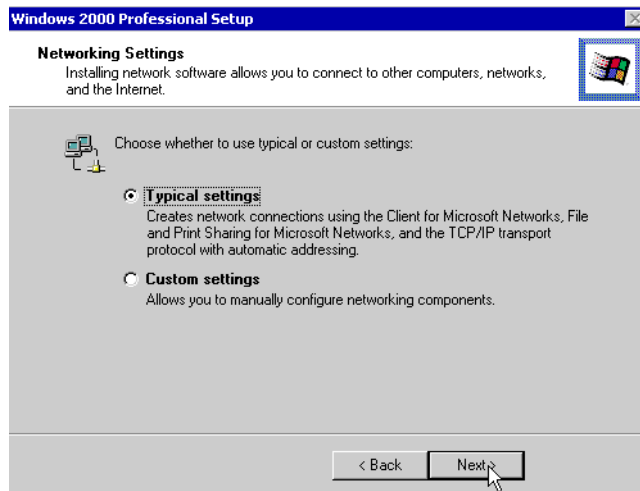
(9) The [Workgroup or Computer Domain] screen will appear.

Choose whether to make your PC on a network or not depending on your PC circumstance.

(10) [Performing Final Tasks] is automatically done by the PS-A.

The [Completing the Windows 2000 Setup Wizard] will appear. Press the [Finish] button and the system

will automatically restart.

(11) When the [Network Identification Wizard] and the [Welcom to the Network Identification Wizard] is

started, please press the [Next] button. The [Users of This Computer] screen will appear. After entering

the desired settings, press the [Next] button and then press the [Finish] button.

■ Windows® XP Setup Procedure

This section describes the setup procedure for Windows® XP. The setting parameters vary depending on your

environment. Ask your network administrator for the appropriate parameters.

NOTE   • The README file stored on the hard disk explains the details of the software and the

information provided and changes made after this manual was printed. Be sure to read the file

before starting this procedure.

• The OS setup operation requires a keyboard.

(1) Once the power of the PS-A unit with Windows$^®$ XP pre-installed is turned ON, the [Welcome to Microsoft Windows] screen will appear. Click [Next].
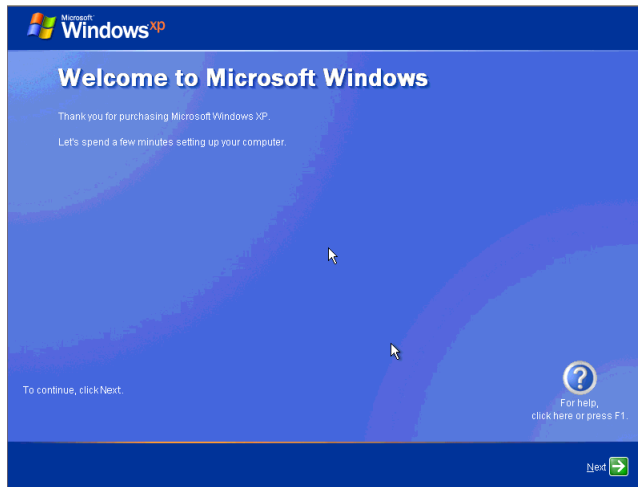
(2) The [The End User License Agreement] screen will appear.

After reading the contents, press [Yes, I accept] if you agree, and click [Next] to continue.

(3) The [Help protect your PC] screen will appear.

Choose whether to update Windows$^®$ automatically. To enable the Automatic Updates, check on [Help protect my PC by turning on Automatic Updates now (recommended)]. To disable it, check [Not right now]. Click [Next] to continue.
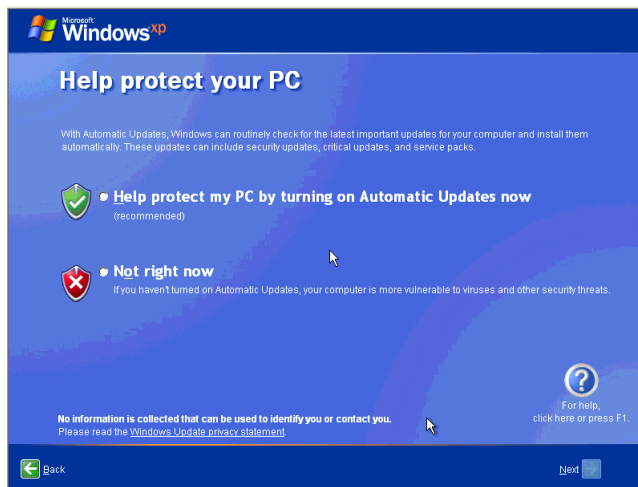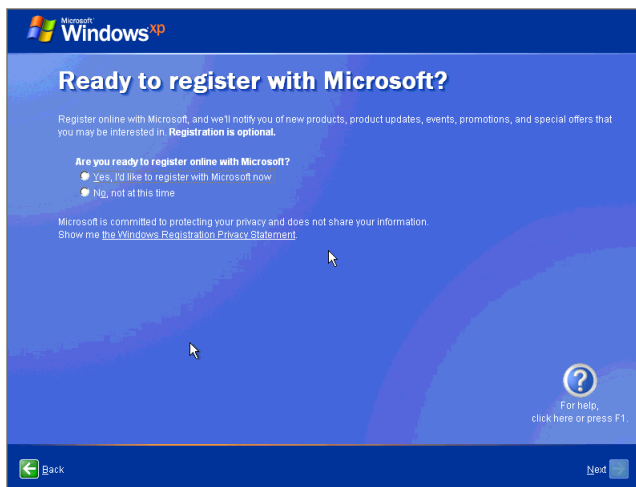

(4) The [What's your computer's name?] screen will appear.

After entering the computer's name, click [Next] to continue. At default, the computer's name has been entered. If it's not necessary to change it, click [Skip].

(5) The [What's your Administrator password?] screen will appear.

If the password is set, enter the password in [Administrator password:] and [Confirm password:] and click [Next]. If the password is not set, click [Skip].

(6)   The [Is this computer in a domain?] screen will appear.

To join the domain, select [Yes, make this computer a member of the following domain:] and enter the domain's name. Not to join the domain, click [Next] to continue.

(7)   The [Checking your internet connectivity] screen will appear and your internet connectivity will be automatically checked.

(8)   The [Ready to register with Microsoft?] screen will appear. If you register, check [Yes, I'd like to register with Microsoft now]. If not, check [No, not at this time]. Press [Next].

(9)   The [Who will use this computer?] will appear. Up to 5 names can be entered for a user's name. After entering the user's name, click [Next] to continue.

(10) The [Thank you!] screen will appear. Click [Finish] to complete the setting.

1.4 PS-A Dedicated Software

1.4.1 Driver

Five types of dedicated PS-A drivers (Audio, Chipset, Graphic Accelerator, LAN and Touch Panel Driver (Mouse Emulator)) are available.

If you purchased the PS-A with no pre-installed OS, download the drivers from the Pro-face support site "Otasuke Pro!". (A PS-A unit that has been recovered using the Recovery Media will have all the required drivers installed). This explanation given in this section assume that the [Proface] folder has been created.

IMPORTANT • Do not uninstall the drivers which have been installed in the PS-A unit.

NOTE • For the procedure and precautions regarding the installation, visit the download page at the "Otasuke Pro!" site.

■ Installing the Chipset Driver

Installing the Chipset driver adds the Chipset feature to the OS.

Double-click on the "infinst_autol.exe" file located in the following folder. Follow the instructions given on the screen to install the driver.

C:\Proface\Chipset\infinst_autol.exe

■ Installing the Audio Driver

Installing the Audio driver enables the OS' Audio feature.

Start "C:\Proface\Audio\wdm_a□□□.exe" file. ("□□□" indicate the driver version.)

Follow the instructions given on the screen to install the driver.

■ Installing the Graphic Accelerator Driver

Installing the Graphic Accelerator Driver will accelerate the screen refresh speed, using special hardware features.

Start "C:\Proface\Display\win2K_xp□□□.exe" file. ("□□□" indicate the driver version.)

Follow the instructions given on the screen to install the driver.

■ Installing the Touch Panel Driver (Mouse Emulator)

Install the Touch Panel Driver (Mouse Emulator) in the PS-A unit. It's necessary to agree to DMC's Mouse Emulator Software (TSC-1310D/DD) License in advance.

SEE→ *Appendices 4 License Agreement (pageA-6)*

(1)   Start "C:\Proface\UPDD_30846P\Setup.exe" file.

(2)   Follow the instructions given on the screen to install the Touch Panel Driver.

For the detailed setteings,refer to C:\Proface\UPDD_30846P\Readmee.pdf

NOTE
- You can open "Touch Panel Property" by selecting the [Start] -> [Programs] -> [UPDD] -> [Settings]. In this dialog box, you can specify the details of the touch panel operation.
- If the touch position recognized in the panel deviates from the actual touch, you need to calibrate the touch panel. Select the [Start] -> [Programs] -> [UPDD] -> [Calibration]. When a cross appears on the screen, press it. Then click [OK] in the [Confirmation after calibration] dialog box to finish the calibration.

■ Installing the LAN Driver

Installing the LAN Driver enables LAN2 to be available.

Start "C:\Proface\LAN\Setup.exe" file. Follow the instructions given on the screen to install the driver.

1.4.2   Special Application Program Features

The special programs designed for the PS-A unit are located in the following folders. Here, it is assumed that the [Proface] folder has already existed on the hard disk of the PS-A unit.

File Name	Windows® XP	Windows® 2000
Smonras.dll		
Ioctl.dll		
Blioctl.dll	C:\Windows\System32	C:\Winnt\System32
Backlight Control.scr		
BlBright.cpl		
Disp.exe	C:\Proface\Disp	
Keyclick.exe	C:\Proface\Keyclick	
SystemMonitor.exe	C:\Proface\Sysmon\GUI	
SmSRvCPL.cpl	C:\Windows\System32	C:\Winnt\System32
Sysmon.sys	C:\Windows\System32\Drivers	C:\Winnt\System32\Drivers

■ API-DLL

These dynamic link libraries allow users to access RAS features that operates on the PS-A via custom-made applications. The following three types are available.

For details, refer to the API Reference Manual which can be downloaded from the Pro-face support site "Otasuke Pro!" (URL http://www.pro-face.com/otasuke/).

◆ Shared Memory Access: Smonras.dll

This dynamic link library allows users to access shared memory via remote RAS features.

◆ RAS Features: Ioctl.dll

This dynamic link library allows users to access RAS features that operates on the PS-A via custom-made PS-A applications.

◆ Backlight Control: Blioctl.sll

This dynamic library allows User-created applications to utilize the PS-A backlight control feature that operates on the PS-A.

■ System Monitoring/RAS Application: SystemMonitor.exe

The RAS and System Monitoring features allow users to monitor temperature, voltage, and fan operation alarms. This program runs on Windows®.

◆ System Monitoring Program: SystemMonitor.exe

$\boxed{\textbf{SEE} \rightarrow}$ ■ *When an Error Occurs (page3-11)*

◆ Watchdog Parameter Setup Program: System Monitor Property

$\boxed{\textbf{SEE} \rightarrow}$ *3.3.1 Description (page3-8)*

■ System File: Sysmon.sys

This system file allows use of the RAS and System Monitoring features. This file should not be modified. If it is modified, the RAS and System Monitoring features may not operate correctly.

■ Backlight OFF Screen Saver: Backlight Control.scr

This software is used to turn OFF the PS-A's backlight after a specified period of inactivity. The use of this feature will help to extend the life of the PS-A's backlight. This program runs on Windows®.

$\boxed{\textbf{NOTE}}$ • Certain application programs may not allow the PS-A's backlight to turn OFF. Test each program individually to check if the screen saver will operate correctly before use.

■ Backlight Control Consale Application: Disp.exe

This command line utility is used to turn OFF both the PS-A's backlight and display. This program runs on the command prompt.

Settings Used	DISP [ON/OFF] ↵
Option Switch	ON: Displayed / OFF: Not Displayed
Return Value	0: Completed Normally / -1: Option Switch Error

$\boxed{\textbf{IMPORTANT}}$ • If your application requires that the OS continuously turn the backlight display ON and OFF, be sure to use the backlight control dll, Blioctl.dll.

■ Keyboard Emulator: Keyclick.exe

This program allows the User's mouse operation to perform keyboard-like data input. When this program is executed on Windows®, a keyboard is displayed on the screen of the PS-A unit.

This is a software keyboard provided by IN-flNITY soft (KeyClick32). Be sure to read the license agreement in the Appendix before use.

SEE→ *Appendices 4 License Agreement (pageA-6)*

NOTE
- Certain application programs may not support this keyboard emulator. Test each application individually to check if the keyboard emulator will operate correctly.
- This program cannot be used to enter Windows® startup screen User Name and Password information.
- To change the Keyclick program's font size a keyboard is required.
- For details concerning the Keyclick program's operation, simply click on the HELP button on the screen keyboard to call up the program's online help data.

■ Backlight Brightness Adjustment: BlBright.cpl

Backlight brightness can be set to one of four levels: Level 0, Level 1, Level 2 or Level 3.

Brightness level 0: Very dark

Brightness level 1: Somewhat dark

Brightness level 2: Somewhat bright

Brightness level 3: Very bright

To use this program, when you use Windows® 2000, click the [Control Panel]'s [Backlight Brightness] icon, and when you use Windows® XP, click the [Backlight Brightness] icon of the [Control Panel]'s [Appearance and Themes]. The default setting is Brightness level 3.

2 | System Setup

1. System Setup Screen Operation
2. System Parameters Setting

This chapter describes how to operate the system setup screen and how to set system parameters.

2.1 System Setup Screen Operation

This section describes the operation of the BIOS setup screen.

IMPORTANT
• Normally, use only the factory (default) settings.

(1) Connect a USB keyboard to the PS-A.

(2) Turn the PS-A's power ON.

(3) After the boot-up screen comes up, press the [F2] key. The setup utility starts and the following screen appears.

Menu

KEYBOARD ACTION KEYS
Provides a summary of the keyboard keys used to carry out the set-up.

Help area
Shows the information of the items you selected.

SYSTEM SETTING SELECTION AREA
Each of the titles (areas) listed here contains system setting items.

(4) To use the [←] [→] arrow keys, change the menu contents. A setting screen of each system will be displayed.

(5) To use the [↑] [↓] arrow keys, move up and down the cursor to select an item of the system, then confirm it by the [Enter] key.

(6) Change the value of the confirmed item with the [-] and [+] keys.

(7) To return from the sub layer to the main layer, press the [Esc] key.

■ BIOS Setup Screen Configuration

| Main
☞Page 2-4
Specify the drive/date. | Primary Master / Primary Slave / Secondary Master
☞Page 2-5
Display the information for the connected devices. |

| Advanced
☞Page 2-6
Set the system details. | Advanced Chipset Control
☞Page 2-9
Set the chipset. |
	DDR SDRAM Configuration ☞Page 2-10 Set the memory.
	I/O Device Configuration ☞Page 2-11 Set the I/O address/interrupt No.
	Keyboard Features ☞Page 2-12 Set the keyboard.
	Cache Memory ☞Page 2-13 Set the cache memory-related items.
	PCI Configuration ☞Page 2-14 Set PCI.
	PCI/PNP ISA IRQ Resource Exclusion ☞Page 2-15 Set the ISA IRQ.
	DMI Event Logging ☞Page 2-16 Set the DMI event logging options.

Intel ☞Page 2-17 Set the system details.	CPU Control Sub-Menu ☞Page 2-18 Set the CPU.
	MCH Control Sub-Menu ☞Page 2-19 Set the MCH.
	MCH Power Management Sub-Menu ☞Page 2-20 Set the chipset (MCH).
	Video (Intel IGD) Control Sub-Menu ☞Page 2-21 Set the display.
	ICH Control Sub-Menu ☞Page 2-22 Set the chipset (ICH).
	Integrated Device Control Sub-Menu ☞Page 2-23 Set the USB, LAN, and PCMCIA.
	ACPI Control Sub-Menu ☞Page 2-24 Set the ACPI.
	APM Control Sub-Menu ☞Page 2-25 Set the APM OS.
	Workaround Control Sub-Menu ☞Page 2-26 Set the APIC.

| Security
☞Page 2-27
Set the password/security options. |

| Boot
☞Page 2-28
Specify the boot order of devices. |

| Exit
☞Page 2-30
Exit the BIOS screen. |

2.2 System Parameters Setting

Select the items to set up the system information. Here, we introduce the system parameters of each item.

IMPORTANT • Normally, use only the factory (default) settings.

2.2.1 Main
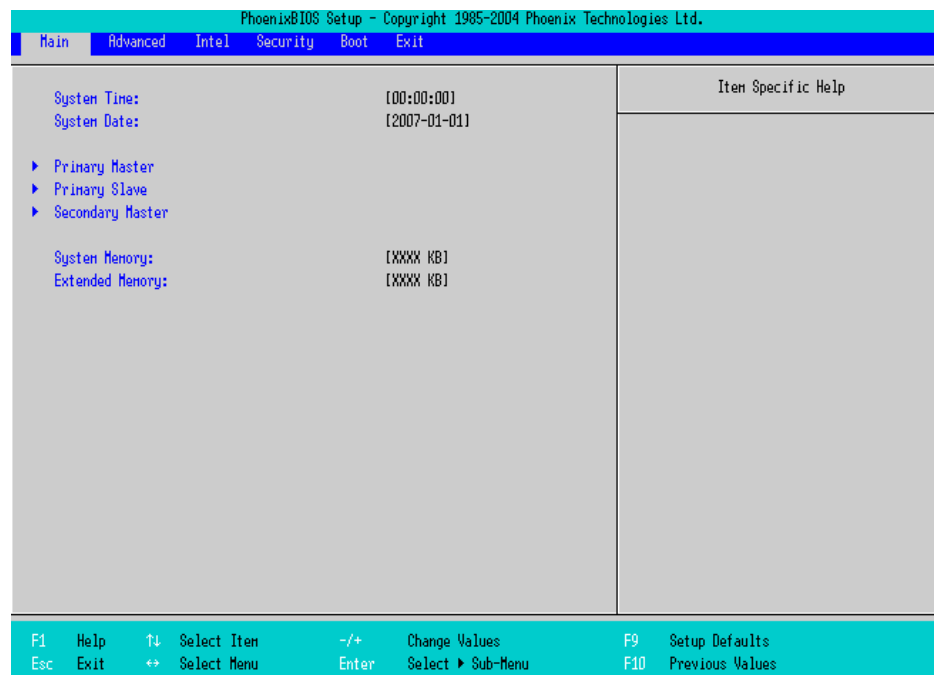
System Time

Shows the time which the PS-A currently recognizes. Move the cursor by the [Tab] key and set a proper time for the PS-A by the [Tab], [+] and [-] keys because the factory default setting is the Japan's Standard Time (GMT+09:00).

System Date

Shows the date which the PS-A currently recognizes. Set a proper date for the PS-A by the [+] and [-] keys.

Primary Master / Primary Slave / Secondary Master

Displays the name of devices connected to the PS-A. Pressing the [Enter] key will call up the Parameter settings menu.
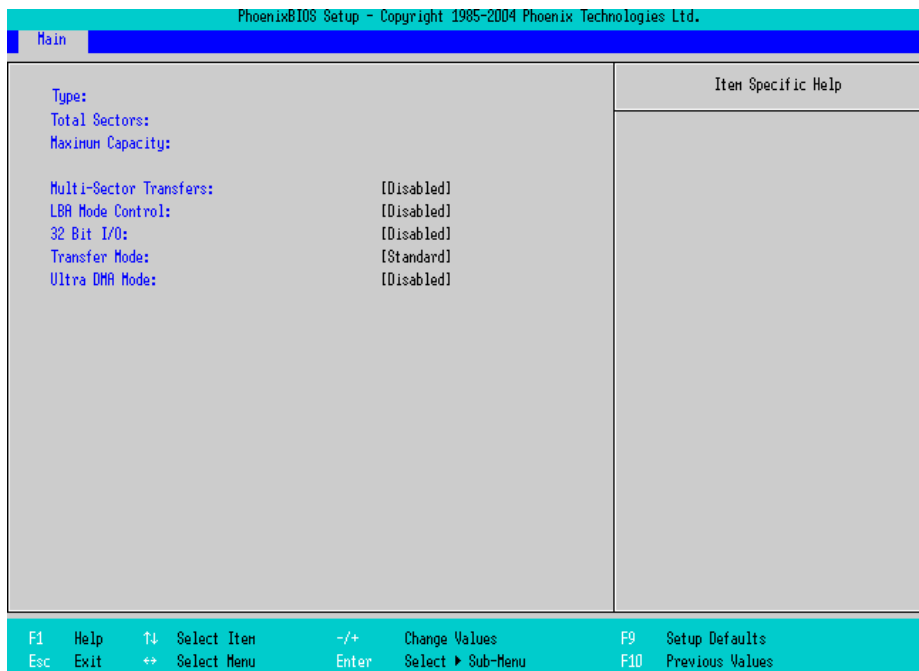
System Memory

Shows the capacity of the "System Memory".

Extended Memory

Shows the capacity of the "Extended Memory". It is the loaded memory - the size of the Video Memory - 2048K byte.

■ Primary Master / Primary Slave / Secondary Master

Point out the cursor at the [Primary Master], [Primary Slave], [Secondary Master] on the "Main screen", and

then press the [Enter] key, so that the following screen is shown.

```
            PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
    Main

                                                             Item Specific Help
     Type:
     Total Sectors:
     Maximum Capacity:

     Multi-Sector Transfers:          [Disabled]
     LBA Mode Control:                [Disabled]
     32 Bit I/O:                      [Disabled]
     Transfer Mode:                   [Standard]
     Ultra DMA Mode:                  [Disabled]














  F1   Help    ↑↓  Select Item    -/+    Change Values      F9   Setup Defaults
  Esc  Exit    ↔   Select Menu    Enter  Select ▶ Sub-Menu  F10  Previous Values
```

Type

Specifies a type of drive which you use. Select from [Auto], [None], [ATAPI Removable], [CD-ROM], [IDE-

Removable], [Other ATAPI], or [User]. The factory default type is [Auto].

|IMPORTANT| • Select [Auto] to have the PS-A recognize the hardware properly.

Total Sectors

Shows the number of disk sectors connected to the unit.

Maximum Capacity

Shows the maximum capacity of the disk connected to the unit.

Multi Sector Transfers

Specifies the number of sectors per block, which are transferred to the memory. When the [Type] is [None],

nothing is displayed. When [Type] is [Auto], the selection is disabled. In other cases, select from [Disabled],

[2 Sectors], [4 Sectors], [8 Sectors], or [16 Sectors].

LBA Mode Control

Enables or disables the Logical Block Address (LBA) instead of the Cylinders, Headers, and Sectors. When

the [Type] is [None], nothing is displayed. When [Type] is [Auto], the selection is disabled. In other cases,

select from [Disabled] or [Enabled].

32 Bit I/O

Specifies an enabled/disabled state for the 32 bit transferring between CPU and IDE controller. Select from

[Enabled] or [Disabled]. When the [Type] is [None], nothing is displayed.

Transfer Mode

Specifies a method of transferring data. When the [Type] is [None], nothing is displayed. When [Type] is

[Auto], the selection is disabled. In other cases, select from [Standard], [Fast PIO 1], [Fast PIO 2],

[Fast PIO 3], [Fast PIO 4], [FPIO 3/DMA 1], or [FPIO 4/DMA 2].

Ultra DMA Mode

Specifies a Ultra DMA mode for the Hard drive. When the [Type] is [None], nothing is displayed. When

[Type] is [Auto], the selection is disabled. In other cases, select from [Disabled], [Mode 0], [Mode 1],

[Mode 2], [Mode 3], [Mode 4], or [Mode 5].

2.2.2 Advanced

```
          PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
    Main    Advanced   Intel   Security   Boot   Exit

                                                              Item Specific Help
    Installed O/S:                    [Win2K/XP]
    Reset Configuration Data:         [No]
    Large Disk Access Mode:           [DOS]
    Local Bus IDE adapter:            [Both]

  ▶ Advanced Chipset Control
  ▶ I/O Device Configuration
  ▶ Keyboard Features
  ▶ Cache Memory
  ▶ PCI Configuration
  ▶ DMI Event Logging

    Disable ACPI _Sx:                 [None]

    Legacy USB Support:               [Enabled]
    Enable memory gap:                [Disabled]
    Summary screen:                   [Disabled]
    QuickBoot Mode:                   [Enabled]
    Extended Memory Testing           [Just zero it]
    Show CMOS Checksum Error:         [Disabled]
    Power On Delay:                   [Disabled]


    F1   Help     ↑↓  Select Item    -/+    Change Values       F9   Setup Defaults
    Esc  Exit     ↔   Select Menu    Enter  Select ▶ Sub-Menu   F10  Previous Values
```

Installed O/S

Specifies a type of OS of the unit. Select from [Other], [Win95], [Win98], [WinMe], or [Win2K/XP]. The

factory default setting is [Win2K/XP].

Reset Configuration Data

Specifies whether you want to reset the Plug & Play information which is recorded in the Extended System

Configuration Data (ESCD) Block of the CMOS RAM, when the system boots up next time. Select from

[Yes] or [No]. The factory default setting is [No].

Large Disk Access Mode

Specifies the access mode. When you use UNIX or NetWare for OS, the setting should be [Other]. Select from

[Dos] or [Other]. The factory default setting is [Dos].

Local Bus IDE adapter

Specifies an enabled/disabled state for the IDE controller. Select from [Both], [Primary], [Secondary], or

[Disabled]. The factory default setting is [Both].

Advanced Chipset Control

Point the cursor to the [Advanced Chipset Control] and press the [Enter] Key, so that you can set up details.

(SEE →) ■ *Advanced Chipset Control (page2-9)*

I/O Device Configuration

Point the cursor to the [I/O Device Configuration] and press the [Enter] Key, so that you can go to the Serial

Port Setting screen.

(SEE →) ■ *I/O Device Configuration (page2-11)*

Keyboard Features

Point the cursor to the [Keyboard Features] and press the [Enter] Key, so that you can go to the keyboard set-

up screen.

(SEE →) ■ *Keyboard Features (page2-12)*

Cache Memory

Point the cursor to the [Cache Memory] and press the [Enter] Key, so that you can go to the set-up screen for

Cache Memory.

(SEE →) ■ *Cache Memory (page2-13)*

PCI Configuration

Point the cursor to the [PCI Configuration] and press the [Enter] Key, so that you can go to the set-up screen

for PCI IRQ.

(SEE →) ■ *PCI Configuration (page2-14)*

DMI Event Logging

Point the cursor to [DMI Event Logging] and press the [Enter] Key to go to the set-up screen for DMI event

logging.

(SEE →) ■ *DMI Event Logging (page2-16)*

Disable ACPI_Sx

Specifies the API's state. Select from [None] or [S1]. With this action, the selecting state will be enabled. The

factory default setting is [None].

Legacy USB Support

When the USB keyboard is used under DOS, specifies an enabled/disabled state for the USB. The choice is

[Enabled] or [Disabled]. The factory default setting is [Enabled].

Enable Memory gap

Specifies an enabled/disabled state for the Memory gap. Select from [Enabled] or [Disabled]. The factory

default setting is [Disabled].

Summary screen

Specifies whether the configuration information of the running system is displayed. Select from [Enabled] or [Disabled]. The factory default setting is [Disabled].

QuickBoot Mode

Specifies whether the system boot-up should be "QuickBoot mode". When the choice is [Disabled], it will execute a system test at the system boot-up. The factory default setting is [Enabled].

Extended Memory Testing

Specifies whether a test for the Extended Memory needs to be executed at the system boot-up. The test types are listed below. The factory default setting is [Just Zero it].

[Normal]   Normal test

[Just Zero it] Simple test

[None]   No test

Show CMOS Checksum Error

Specifies whether an error message should be displayed when a CMOS checksum error occurs. Select from [Enabled] or [Disabled]. The factory default setting is [Disabled].

Power On Delay

Specifies whether the system waits during boot-up. Select from [Enabled] or [Disabled]. When [Enabled] is selected, the system waits about 4 seconds during boot-up. The factory default setting is [Disabled].

NOTE • If a USB device such as USB memory is connected to the PS-A when the PS-A is started, the following phenomenon may occur, depending on the device:

   • It takes about 1 minute before the OS starts up.

   • The PS-A does not recognize the USB device.

   These problems may be solved by setting [Power On Delay] to [Enable].

■ Advanced Chipset Control

Specifies parameters for the chipset. Point the cursor to the [Advanced Chipset Control] on the [Advanced]

screen and press the [Enter] Key, so that the following screen will be displayed.

```
              PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
      Advanced

                                                                    Item Specific Help
   ▶ DDR SDRAM Configration
     ECC Config:                    [Disabled]
     ECC Error Type                 [SMI]
     SERR signal condition          [Multiple bit]




















   F1   Help     ↑↓  Select Item    -/+    Change Values        F9   Setup Defaults
   Esc  Exit     ↔   Select Menu     Enter  Select ▶ Sub-Menu    F10  Previous Values
```
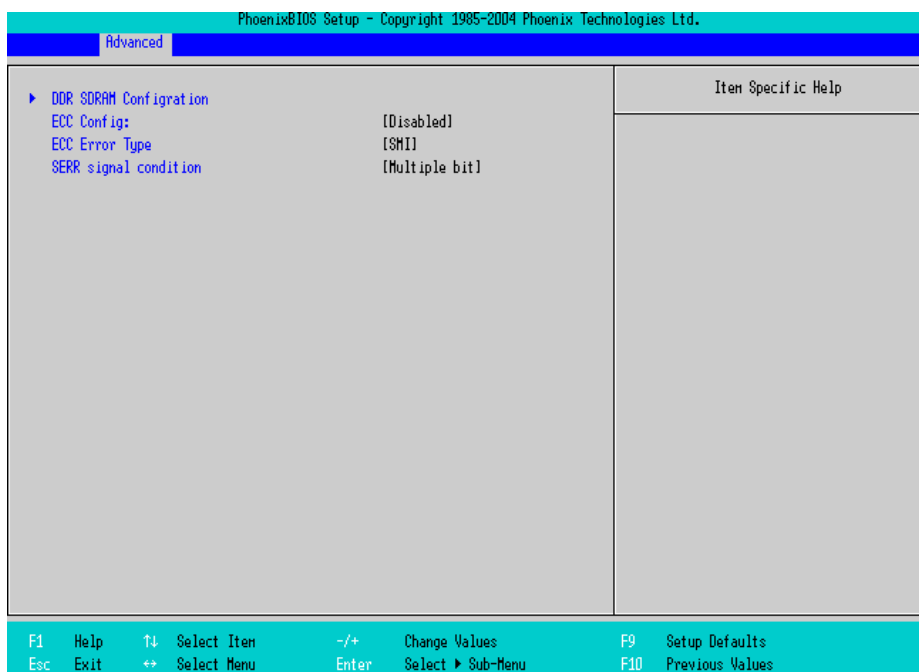
DDR SDRAM Configuration

Point the cursor to the [DDR SDRAM Configuration] and press the [Enter] Key, so that you can go to the

Memory Setting screen.

SEE →   ◆ *DDR SDRAM Configuration (page2-10)*

ECC Config

Specifies whether the ECC function for memory, which is a function of recovering errors, needs to be used.

This parameter is displayed only when memory with the ECC function is used. Select from [ECC] or [Dis-

abled]. The factory default setting is [Disabled].

ECC Error Type

Specifies the interruption setting when an ECC error occurs. This parameter is displayed only when memory

with the ECC function is used. Select from [None], [NMI], [SMI], or [SCI]. The factory default setting is

[SMI].

SERR signal condition

Specifies error bit(s) for ECC. This parameter is displayed only when memory with the ECC function is used.

Select from [None], [Single bit], [Multiple bit], or [Both]. The factory default setting is [Multiple bit].

◆DDR SDRAM Configuration

The memory setting parameters are displayed. Point the cursor to the [DDR SDRAM Configuration] on the

[Advanced Chipset Control] and press the [Enter] Key, so that the following screen will be displayed.

```
              PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
      Advanced

                                                              Item Specific Help
   DDR Speed:
   Active to Precharge delay:
   SDRAM CAS# Latency:
   RAS# to CAS# Delay:
   RAS# Precharge:




   F1    Help    ↑↓  Select Item    -/+    Change Values      F9   Setup Defaults
   Esc   Exit    ↔   Select Menu    Enter  Select ▶ Sub-Menu  F10  Previous Values
```
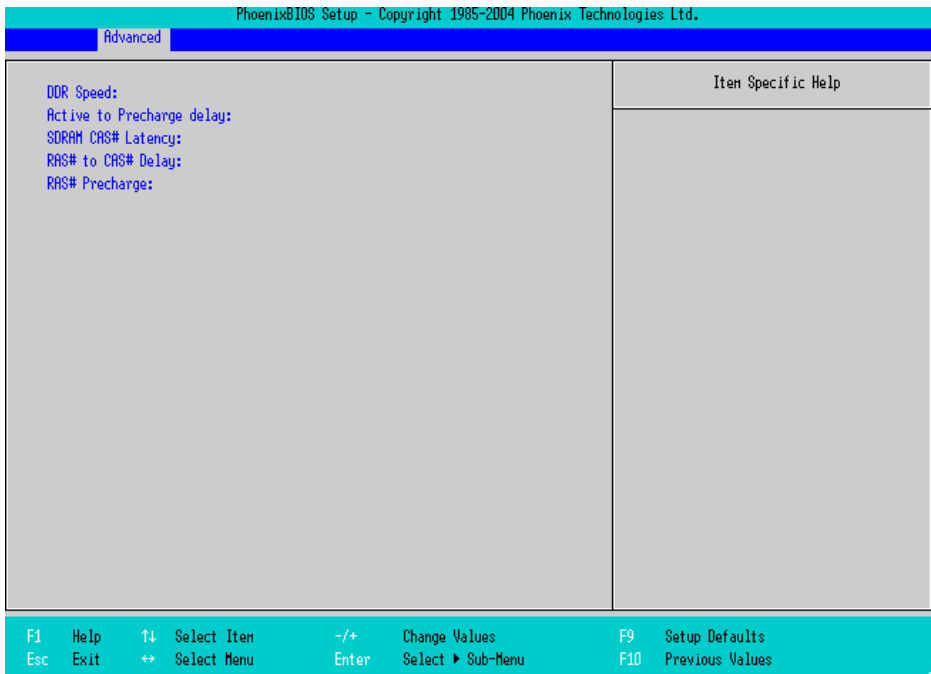
DDR Speed

Shows the clock frequency for the memory.

Active to Precharge delay

Shows the control status of the timing of DRAM Precharge processing.

SDRAM CAS# Latency

Shows the latency time for CAS.

RAS# to CAS# Delay

Shows a transfer timing from RAS to CAS.

RAS# Precharge

Shows the number of cycles of RAS precharge.

■ I/O Device Configuration

Specifies the address and interrupt level of the I/O ports. Point the cursor to the [I/O Device Configuration] on the [Advanced] screen and press the [Enter] Key, so that the following screen will be displayed.

```
PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
    Advanced

                                                                    Item Specific Help
   Onboard LAN 1:                   [Enabled]
   Onboard LAN 2:                   [Enabled]

   Onboard Serial Port 1:           [Enabled]
   Base I/O address:                [3F8]
   Interrupt:                       [IRQ 4]
   Onboard Serial Port 2:           [Enabled]
   Base I/O address:                [2F8]
   Interrupt:                       [IRQ 3]




 F1   Help    ↑↓  Select Item    -/+    Change Values       F9   Setup Defaults
 Esc  Exit    ↔   Select Menu    Enter  Select ▶ Sub-Menu   F10  Previous Values
```

Onboard LAN 1, 2

Specifies an enabled/disabled state for the Onboard LAN 1,2. Select from [Enabled] or [Disabled]. The factory default setting is [Enabled].

Onboard Serial Port 1

Specifies an enabled/disabled state for the COM1. Select from [Disabled] or [Enabled]. The factory default setting is [Enabled]. In addition, the factory default setting for Base I/O Address is [3F8], and for Interrupt is [IRQ 4].

Onboard Serial Port 2

Specifies an enabled/disabled state for the COM2. Select from [Disabled] or [Enabled]. The factory default setting is [Enabled]. In addition, the factory default setting for Base I/O Address is [2F8], and for Interrupt is [IRQ 3].

■ Keyboard Features

Specifies the keyboard-related parameters. Point the cursor to the [Keyboard Features] on the [Advanced

Chipset Control] and press the [Enter] Key, so that the following screen will be displayed.

```
            PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
    Advanced

                                                              Item Specific Help
    NumLock:                          [On]
    Key Click:                        [Disabled]
    Keyboard auto-repeat rate:        [30/sec]
    Keyboard auto-repeat delay:       [1/2 sec]

    F1   Help    ↑↓  Select Item    -/+    Change Values      F9   Setup Defaults
    Esc  Exit    ↔   Select Menu    Enter  Select ▶ Sub-Menu  F10  Previous Values
```
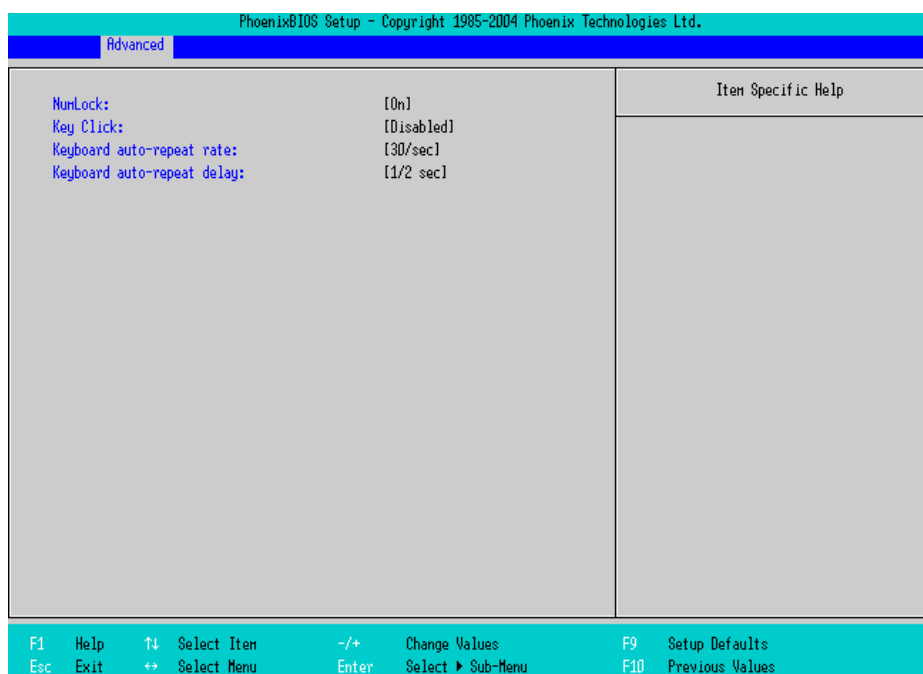
NumLock

Specifies the NumLock status. Select from [Auto], [On], or [Off]. The factory default setting is [On].

KeyClick

Specifies an enabled/disabled state for the keyboard's click sound. Select from [Enabled] or [Disabled]. The

factory default setting is [Disabled].

Keyboard auto-repeat rate

Specifies the figures of how many times a key can input letters while being pressed for a second. Select from

[30/sec.], [26.7/sec.], [21.8/sec.], [18.5/sec.], [13.3/sec.], [10/sec.], [6/sec.], or [2/sec.]. The factory default

setting is [30/sec.].

Keyboard auto-repeat delay

Specifies a time duration until the auto-repeat function becomes enabled from a key is pressed. Select from

[1/4 sec.], [1/2 sec.], [3/4 sec.], or [1 sec.]. The factory default setting is [1/2 sec.].

■ Cache Memory

Specifies the parameters for the cache memory. Point the cursor to the [Cache Memory] on the [Advanced] screen and press the [Enter] Key, so that the following screen will be displayed.

```
PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
  Advanced

                                                              Item Specific Help
  Memory Cache:                    [Enabled]
  Cache System BIOS area:          [Write Protect]
  Cache Video BIOS area:           [Write Protect]
  Cache Base 0-512k:               [Write Back]
  Cache Base 512k-640k:            [Write Back]
  Cache Extended Memory Area:      [Write Back]
  Cache A000 - AFFF:               [Disabled]
  Cache B000 - BFFF:               [Disabled]
  Cache C800 - CBFF:               [Write Protect]
  Cache CC00 - CFFF:               [Write Protect]
  Cache D000 - D3FF:               [Disabled]
  Cache D400 - D7FF:               [Disabled]
  Cache D800 - DBFF:               [Disabled]
  Cache DC00 - DFFF:               [Disabled]
  Cache E000 - E3FF:               [Disabled]
  Cache E400 - E7FF:               [Write Protect]
  Cache E800 - EBFF:               [Write Protect]
  Cache EC00 - EFFF:               [Write Protect]




  F1   Help    ↑↓  Select Item    -/+    Change Values        F9   Setup Defaults
  Esc  Exit    ↔   Select Menu    Enter  Select ▶ Sub-Menu    F10  Previous Values
```

Memory Cache

Specifies an enabled/disabled state for the Memory Cache. Select from [Enabled] or [Disabled]. The factory default setting is [Enabled].

Cache System BIOS area

Specifies the cache set-up for the System BIOS area. Select from [uncached] or [Write Protect]. The factory default setting is [Write Protect].

Cache Video BIOS area

Specifies the cache set-up for the VIDEO BIOS area. Select from [uncached] or [Write Protect]. The factory default setting is [Write Protect].

Cache Base 0-512k

Specifies the cache set-up for the Base Memory, 0 ~ 512k. Select from [uncached], [Write Through], [Write Protect], or [Write Back]. The factory default setting is [Write Back].

Cache Base 512-640k

Specifies the cache set-up for the Base Memory, 512 ~ 620k. Select from [uncached], [Write Through], [Write Protect], or [Write Back]. The factory default setting is [Write Back].

Cache Extended Memory Area

Specifies the cache set-up for the Extended Memory area. Select from [uncached], [Write Through], [Write Protect], or [Write Back]. The factory default setting is [Write Back].
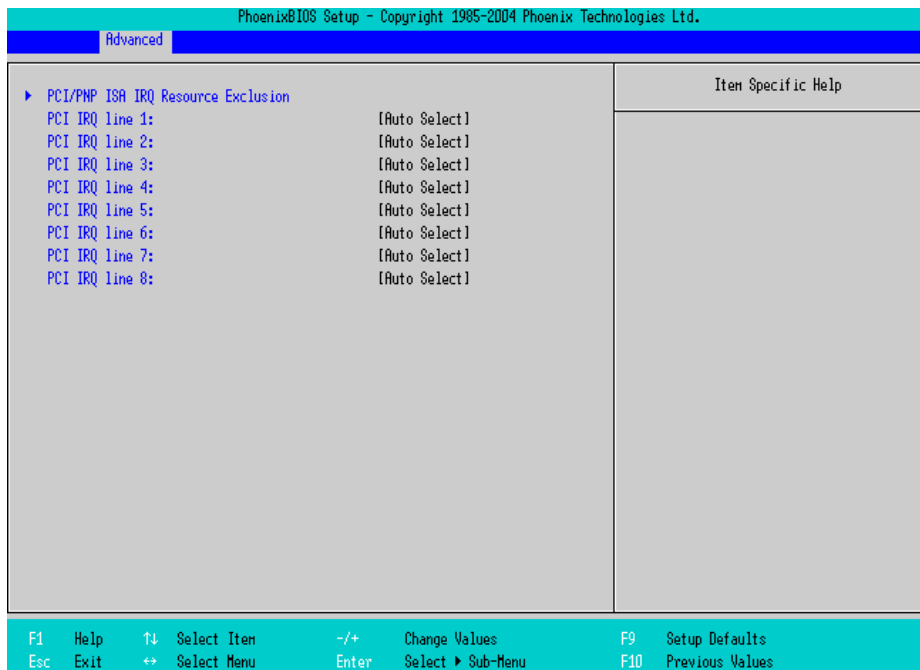
Cache xxxx-xxxx

Specifies the cache setting for each address. Select from [Disabled], [USWC Caching] (The address A000 - AFFF and B000 - BFFF are only available.), [Write Through], [Write Protect], or [Write Back]. The factory default setting is as follows.

A000 - AFFF	Disabled
B000 - BFFF	Disabled
C800 - CBFF	Write Protect (VIDEO Memory)
CC00 - CFFF	Write Protect
D000 - D3FF	Disabled
D400 - D7FF	Disabled
D800 - DBFF	Disabled
DC00 - DFFF	Disabled
E000 - E3FF	Disabled
E400 - E7FF	Write Protect (PXE)
E800 - EBFF	Write Protect
EC00 - EFFF	Write Protect

■ PCI Configuration

Specifies the PCI IRQ parameters. Point the cursor to the [PCI Configuration] on the [Advanced] screen and press the [Enter] Key, so that the following screen will be displayed.

```
                 PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
         Advanced

                                                                    Item Specific Help
   ▶  PCI/PNP ISA IRQ Resource Exclusion
      PCI IRQ line 1:                    [Auto Select]
      PCI IRQ line 2:                    [Auto Select]
      PCI IRQ line 3:                    [Auto Select]
      PCI IRQ line 4:                    [Auto Select]
      PCI IRQ line 5:                    [Auto Select]
      PCI IRQ line 6:                    [Auto Select]
      PCI IRQ line 7:                    [Auto Select]
      PCI IRQ line 8:                    [Auto Select]




   F1   Help     ↑↓  Select Item       -/+    Change Values       F9   Setup Defaults
   Esc  Exit     ↔   Select Menu       Enter  Select ▶ Sub-Menu   F10  Previous Values
```

PCI/PNP ISA IRQ Resource Exclusion

Move the cursor to the [PCI/PNP ISA IRQ Resource Exclusion] on the [PCI Configuration] menu and press the [Enter] Key, so that you can go to the ISA IRQ set-up screen.

SEE →   ◆ *PCI/PNP ISA IRQ Resource Exclusion (page2-15)*

PCI IRQ line 1 ~ 8

Specifies the Interrupt Request Lines (IRQ) for PCI. Select from [Disabled], [Auto Select], [3], [4], [5], [7], [9], [10], [11], [12], [14], or [15]. The factory default setting is [Auto Select].

◆PCI/PNP ISA IRQ Resource Exclusion

Specifies the ISA IRQ parameters. Point the cursor to the [PCI/PNP ISA IRQ Resource Exclusion] on the [PCI Configuration] menu and press the [Enter] Key, so that the following screen will be displayed.

```
                    PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
         Advanced

                                                                     Item Specific Help
      IRQ 3:                          [Available]
      IRQ 4:                          [Available]
      IRQ 5:                          [Available]
      IRQ 7:                          [Available]
      IRQ 9:                          [Available]
      IRQ 10:                         [Available]
      IRQ 11:                         [Available]


    F1   Help    ↑↓  Select Item   -/+    Change Values       F9   Setup Defaults
    Esc  Exit    ↔   Select Menu   Enter  Select ▶ Sub-Menu   F10  Previous Values
```

IRQ 3, 4, 5, 7, 9, 10, 11

Specifies the IRQ which is allocated to the legacy device. Select from [Available] or [Reserved]. The factory default setting is [Available].

■ DMI Event Logging

Specifies the parameters related to DMI event logging. Point the cursor to the [DMI Event Logging] on the

[Advanced] screen and press the [Enter] Key, so that the following screen will be displayed.

```
          PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
      Advanced

                                                            Item Specific Help
    Event log validity
    Event log capacity

    View DMI event log

    Event Logging                    [Enabled]
    ECC Event Logging                [Enabled]

    Mark DMI events as read
    Clear all DMI event logs         [No]



 F1    Help    ↑↓  Select Item    -/+    Change Values       F9   Setup Defaults
 Esc   Exit    ↔   Select Menu    Enter  Select ▶ Sub-Menu   F10  Previous Values
```
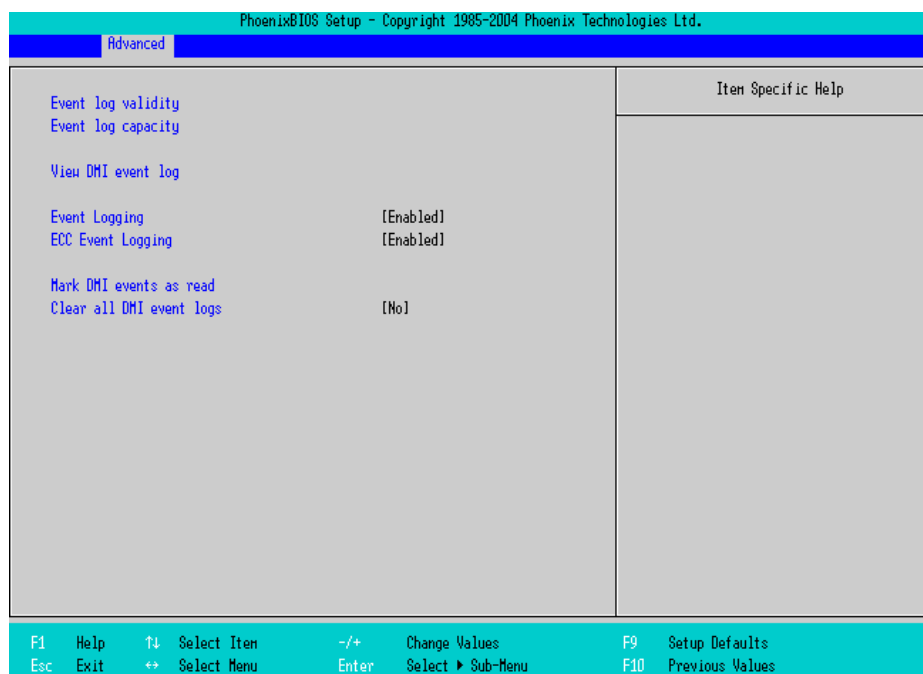
Event log validity

Shows the status of the event log storage area. [Valid] is shown when the status is normal, and [Not valid] is

shown when the status is abnormal.

Event log capacity

Shows the status of the area to which event logs are written. [Full] is shown when the area is full, and [Space

Available] is shown when the area is not full.

View DMI event log

Point the cursor to [View DMI event log] and press the [Enter] Key to view the DMI event logs.

Event Logging

Specifies whether event logs need to be recorded. Select from [Enabled] or [Disabled]. The factory default

setting is [Enabled].

ECC Event Logging

Specifies whether the event logs related to memory ECC need to be recorded. Select from [Enabled] or

[Disabled]. The factory default setting is [Enabled].

Mark DMI events as read

Point the cursor to [Mark DMI events as read] and press the [Enter] Key to mark unread event logs as read.

Clear all DMI event logs

Specifies whether all the recorded DMI event logs need to be deleted. Select from [Yes] or [No]. The factory

default setting is [No].

2.2.3　Intel
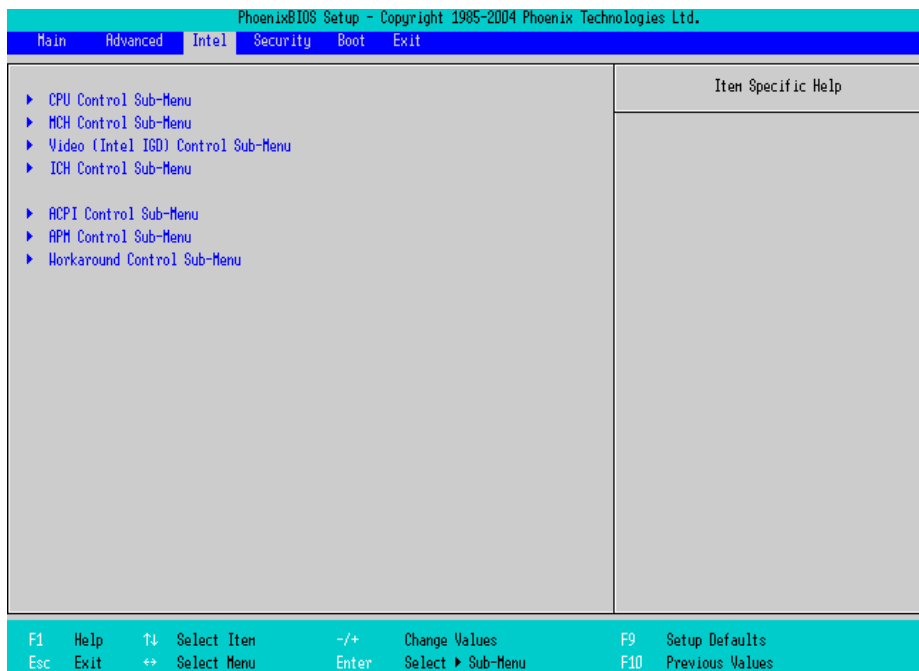
```
              PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
    Main     Advanced   Intel   Security   Boot   Exit

                                                              Item Specific Help
    ▶ CPU Control Sub-Menu
    ▶ MCH Control Sub-Menu
    ▶ Video (Intel IGD) Control Sub-Menu
    ▶ ICH Control Sub-Menu

    ▶ ACPI Control Sub-Menu
    ▶ APM Control Sub-Menu
    ▶ Workaround Control Sub-Menu












    F1   Help    ↑↓  Select Item    -/+    Change Values      F9   Setup Defaults
    Esc  Exit    ↔   Select Menu     Enter  Select ▶ Sub-Menu  F10  Previous Values
```

CPU Control Sub-Menu

Point the cursor to the [CPU Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that you

can go to the [CPU] set-up screen.

(SEE→)　■ *CPU Control Sub-Menu (page2-18)*

MCH Control Sub-Menu

Point the cursor to the [MCH Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that you

can go to the [MCH] set-up screen.

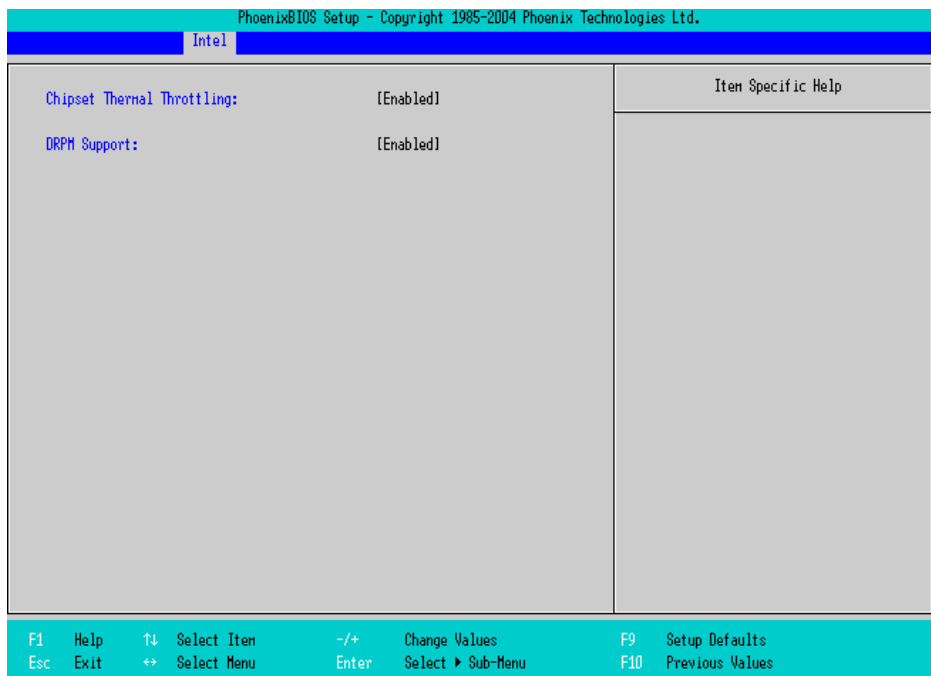(SEE→)　■ *MCH Control Sub-Menu (page2-19)*

Video (Intel IGD) Control Sub-Menu

Point the cursor to the [Video (Intel IGD) Control Sub-Menu] on the [Intel] menu and press the [Enter] Key,

so that you can go to the set-up screen for display.

(SEE→)　■ *Video (Intel IGD) Control Sub-Menu (page2-21)*

ICH Control Sub-Menu

Point the cursor to the [ICH Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that you can

go to the [ICH] set-up screen.

(SEE→)　■ *ICH Control Sub-Menu (page2-22)*

ACPI Control Sub-Menu

Point the cursor to the [ACPI Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that you can go to the [ACPI] set-up screen.

SEE →   ■ *ACPI Control Sub-Menu (page2-24)*

APM Control Sub-Menu

Point the cursor to the [APM Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that you can go to the [APM] set-up screen. If you use APM OS, you are requested to set up this configuration.

SEE →   ■ *APM Control Sub-Menu (page2-25)*

Workaround Control Sub-Menu

Point the cursor to the [Workaround Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that you can go to the set-up screen of the whole platform.

SEE →   ■ *Workaround Control Sub-Menu (page2-26)*

■ CPU Control Sub-Menu

Specifies the CPU parameters. Point the cursor to the [CPU Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that the following screen will be displayed.

```
PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
        Intel

                                                              Item Specific Help
  Processor Power Management:        [Enabled]
  Thermal Control Circuit:           [TM1]












 F1   Help     ↑↓  Select Item     -/+    Change Values      F9   Setup Defaults
 Esc  Exit     ↔   Select Menu      Enter  Select ▶ Sub-Menu  F10  Previous Values
```
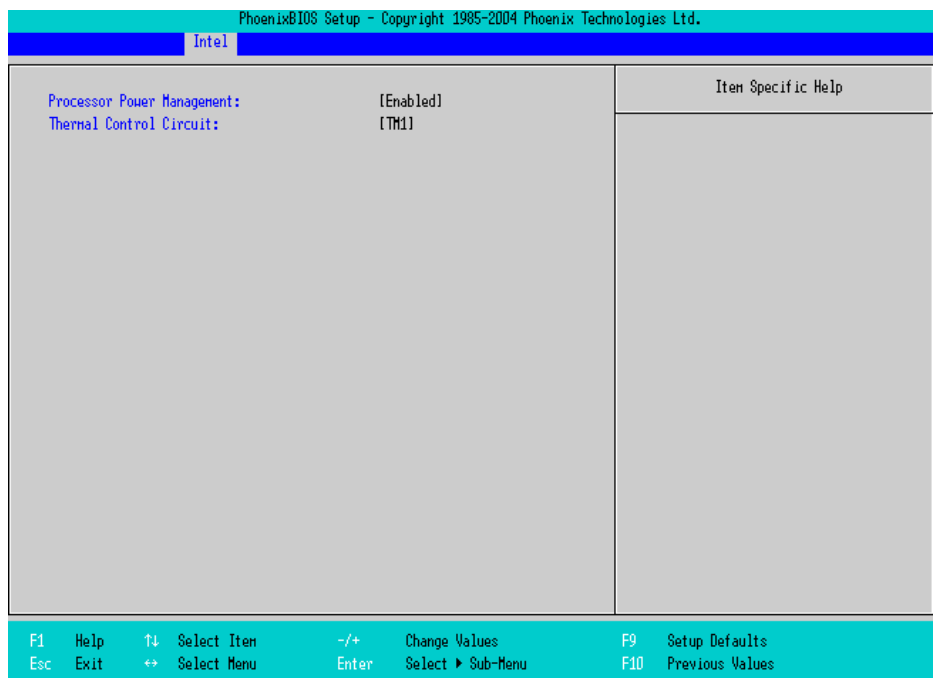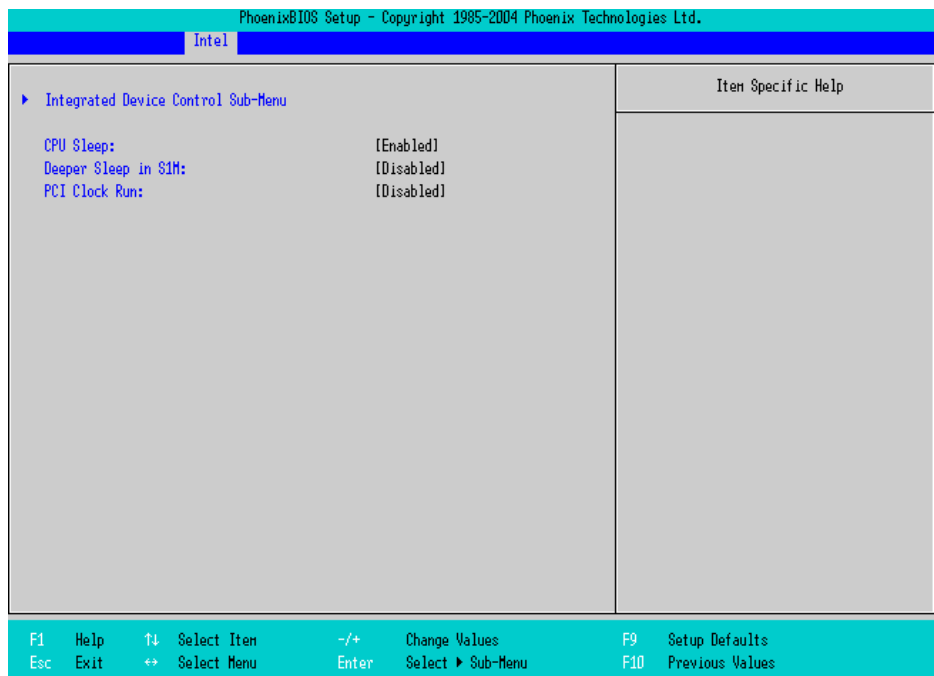
Processor Power Management

This is a function that controls the processor's power state. Select from [Disabled] or [C States Only]. The factory default setting is [C States Only] and the default should be applied.

Thermal Control Circuit

This is a function that protects the CPU's temperature, and its setting is a situation that if it exceeds the limit that CPU is able to work properly. Select from [Disabled], [TM1], or [TM2]. The factory default setting is [TM1].

■ MCH Control Sub-Menu

Specifies the MCH control parameters. Point the cursor to the [MCH Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that the following screen will be displayed.

```
PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
        Intel

                                                          Item Specific Help
 ▶  MCH Power Management Sub-Menu

    DDR ECC Operation:              [Enabled]




 F1    Help     ↑↓  Select Item     -/+    Change Values      F9    Setup Defaults
 Esc   Exit     ↔   Select Menu     Enter  Select ▶ Sub-Menu  F10   Previous Values
```
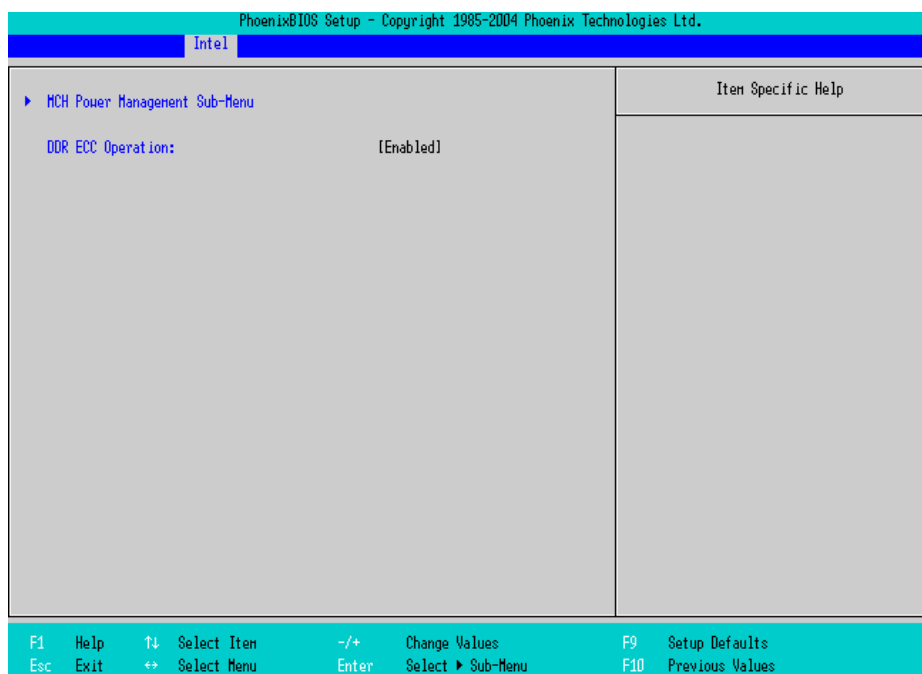
MCH Power Management Sub-Menu

Point the cursor to the [MCH Power Management Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that you can go to the Chipset set-up screen.

(SEE→)   ◆ *MCH Power Management Sub-Menu (page2-20)*

DDR ECC Operation

Specifies whether you use ECC memory or not. Select from [Enabled] or [Disabled]. The factory default setting is [Enabled].

◆MCH Power Management Sub-Menu

Specifies the chipset (MCH) parameters. Point the cursor to the [MCH Power Management Sub-Menu] on the

[Intel] menu and press the [Enter] Key, so that the following screen will be displayed.

```
                    PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
            Intel

                                                                        Item Specific Help
    Chipset Thermal Throttling:        [Enabled]

    DRPM Support:                      [Enabled]












    F1    Help     ↑↓  Select Item     -/+    Change Values      F9   Setup Defaults
    Esc   Exit     ↔   Select Menu      Enter  Select ▶ Sub-Menu  F10  Previous Values
```

Chipset Thermal Throttling

Specifies a thermal throttle, a system to prevent a themorunway, for chipset. Select from [Enabled] or

[Disabled]. The factory default setting is [Enabled].

DRPM Support

Specifies an enabled/disabled state for the setting of Dynamic Row Power Management. Select from

[Enabled] or [Disabled]. The factory default setting is [Enabled].

■ Video (Intel IGD) Control Sub-Menu

Specifies the display-related parameters. Point the cursor to the [Video (Intel IGD) Control Sub-Menu] on the

[Intel] menu and press the [Enter] Key, so that the following screen will be displayed.

```
                 PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
            Intel

                                                                        Item Specific Help
   Default Primary Video Adapter:        [PCI]

   IGD - Memory Size:                    [UMA = 8MB]


















 F1   Help     ↑↓   Select Item      -/+     Change Values        F9    Setup Defaults
 Esc  Exit      ↔    Select Menu      Enter   Select ▶ Sub-Menu    F10   Previous Values
```
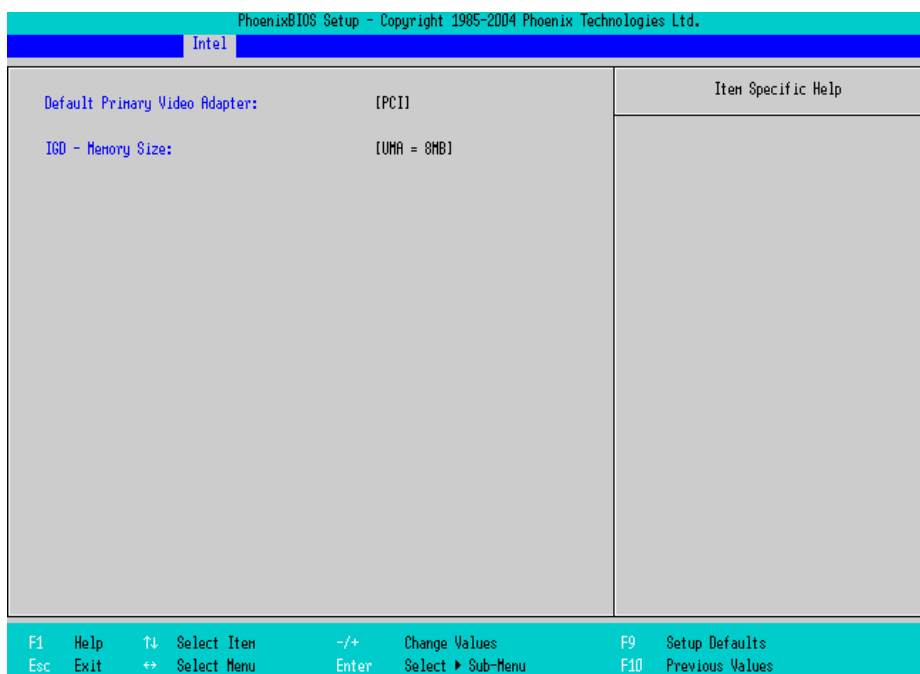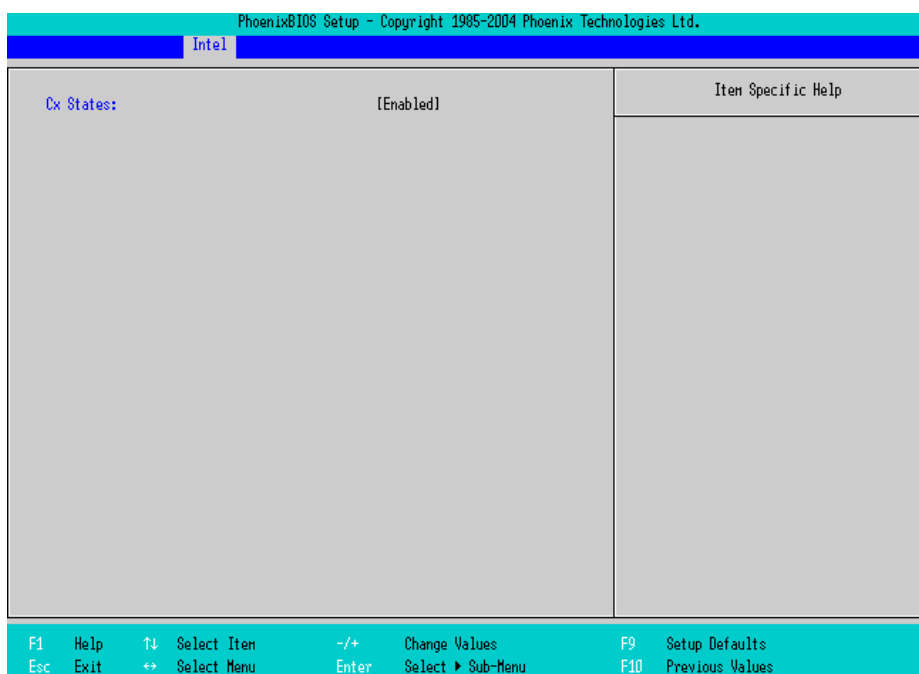
Default Primary Video Adapter

Selects a priority of the [PCI] or [AGP] which should take for displaying. The factory default setting is [PCI].

IGD-Memory Size

Specifies an allocation capacity for the Video Memory. Select from [UMA=1MB], [UMA=8MB],

[UMA=16MB], or [UMA=32MB]. the factory default setting is [UMA=8MB].

■ ICH Control Sub-Menu

Specifies the chipset (ICH) parameters. Point the cursor to the [ICH Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that the following screen will be displayed.
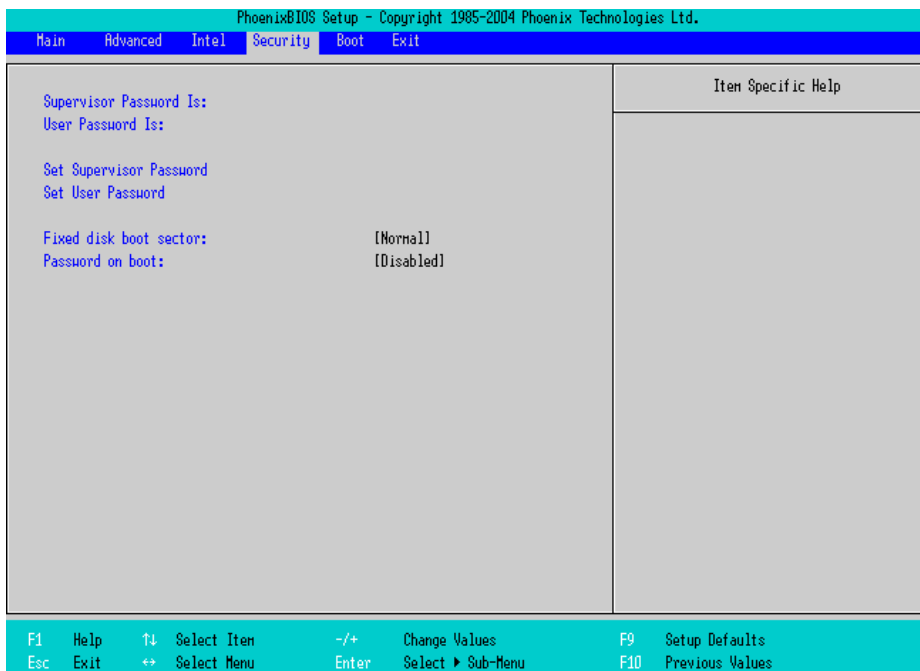
```
PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
        Intel

                                                              Item Specific Help
  ▶  Integrated Device Control Sub-Menu

     CPU Sleep:                        [Enabled]
     Deeper Sleep in S1M:              [Disabled]
     PCI Clock Run:                    [Disabled]














 F1   Help      ↑↓  Select Item    -/+    Change Values       F9    Setup Defaults
 Esc  Exit      ↔   Select Menu    Enter  Select ▶ Sub-Menu   F10   Previous Values
```

Integrated Device Control Sub-Menu

Point the cursor to the [Integrated Device Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that you can go to the setting screen where an enabled/disabled state for the USB, LAN and PCMCIA is specified.

CPU Sleep

Specifies an enabled/disabled state for the CPU power saving. Select from [Enabled] or [Disabled]. The factory default setting is [Enabled].

Deeper Sleep in S1M

Specifies an enabled/disabled state for the Deeper Sleep mode. Select from [Enabled] or [Disabled]. The factory default setting is [Disabled].

PCI Clock Run

Specifies an enabled/disabled state for the PCI Clock Run protocols for Cardbus Controller. Select from [Enabled] or [Disabled]. The factory default setting is [Disabled].

◆Integrated Device Control Sub-Menu

Specifies whether to enable or disable USB, LAN, and PCMCIA. In [ICH Control Sub-Menu], point the cursor to the [Integrated Device Control Sub-Menu] and press the [Enter] Key to display the following screen.

```
                 PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
               Intel

                                                                      Item Specific Help
    USB - Device 29, All Functions:        [Enabled]
    USB - Device 29, F1 and F2:            [Enabled]
    USB - Device 29, F1 Only:              [Enabled]
    USB - Device 29, F2 Only:              [Enabled]
    USB - Device 29, Function 7:           [Enabled]

    IDE  - Device 31, Function 1:          [Enabled]
    AC97A - Device 31, Function 5:         [Enabled]













    F1    Help      ↑↓   Select Item      -/+    Change Values       F9    Setup Defaults
    Esc   Exit      ↔    Select Menu       Enter  Select ▶ Sub-Menu   F10   Previous Values
```

USB-Device 29, All Functions / USB-Device 29, F1 and F2

Specifies an enabled/disabled state for the USB device. Select from [Enabled] or [Disabled]. The factory default setting is [Enabled].

USB-Device 29, F1 only / USB-Device 29, Function 7

Specifies an enabled/disabled state for the USB device. Select from [Enabled] or [Disabled]. The factory default setting is [Enabled].

IDE-Device 31, Function 1

Specifies an enabled/disabled state for the IDE device. Select from [Enabled] or [Disabled]. The factory default setting is [Enabled].

AC97A-Device 31, Function 5

Specifies an enabled/disabled state for the AC97 Audio. Select from [Enabled] or [Disabled]. The factory default setting is [Enabled].

■ ACPI Control Sub-Menu

Point the cursor to the [ACPI Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that the

following screen will be displayed.

```
         PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
         Intel

                                                              Item Specific Help
  APIC - IO APIC Mode:              [Enabled]
  HPET - High Performance Event Timer:   [Disabled]




















  F1   Help    ↑↓  Select Item     -/+    Change Values      F9   Setup Defaults
  Esc  Exit    ↔   Select Menu      Enter  Select ▶ Sub-Menu  F10  Previous Values
```
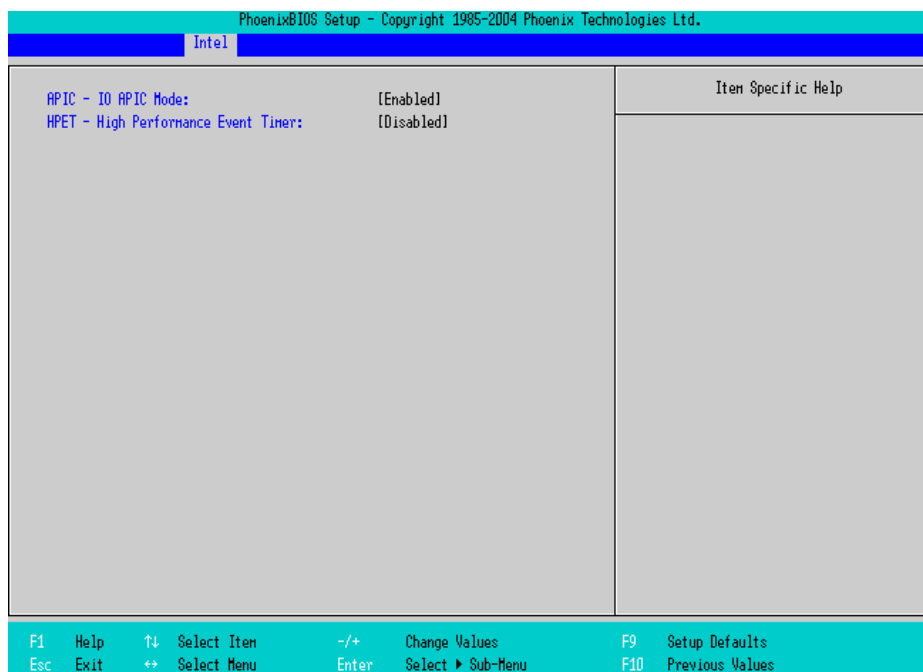
ACPI-IO APIC Mode

Specifies an enabled/disabled state for the APIC. Select from [Enabled] or [Disabled]. The factory default

setting is [Enabled].

HPET-High Performance Event Timer

Specifies the timer setting for the High Precision Event Timer. Select from [Enabled] or [Disabled]. The

factory default setting is [Disabled].

■ APM Control Sub-Menu

Point the cursor to the [APM Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that the

following screen will be displayed.

```
                PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
          Intel

                                                                    Item Specific Help
     Cx States:                        [Enabled]




     F1    Help    ↑↓  Select Item     -/+    Change Values      F9    Setup Defaults
     Esc   Exit    ↔   Select Menu     Enter  Select ▶ Sub-Menu  F10   Previous Values
```

Cx States

Specifies whether you use a power saving state when using APM OS. Select from [Enabled] or [Disabled].

The factory default setting is [Enabled].

■ Workaround Control Sub-Menu

Point the cursor to the [Workaround Control Sub-Menu] on the [Intel] menu and press the [Enter] Key, so that the following screen will be displayed.
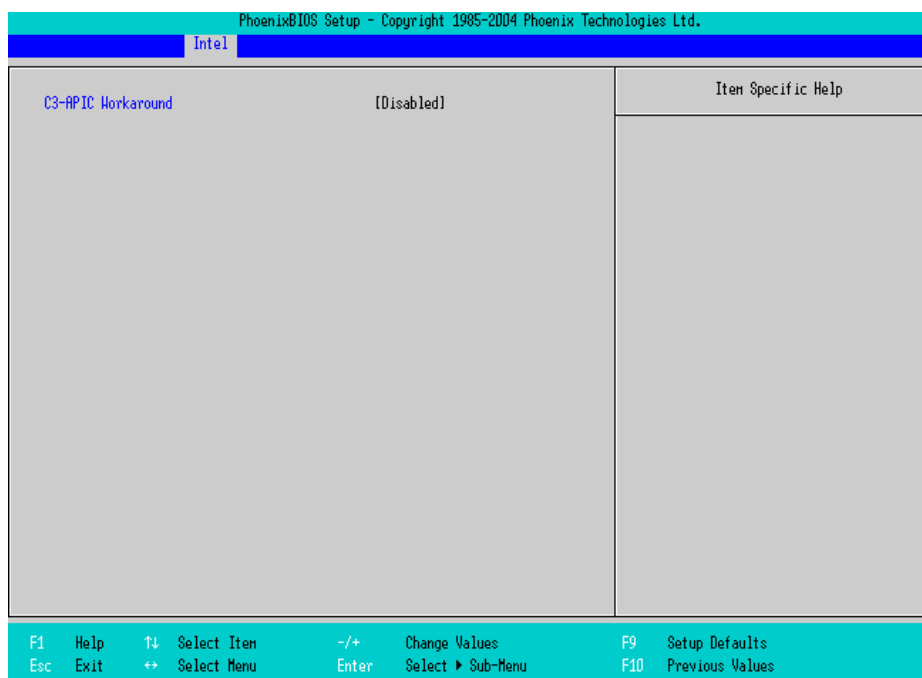
C3-APIC Workaround

Select from [Enabled], [Auto], or [Disabled]. The factory default setting is [Disabled].

2.2.4   Security

```
              PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
    Main      Advanced    Intel   Security   Boot    Exit

                                                              Item Specific Help

    Supervisor Password Is:
    User Password Is:

    Set Supervisor Password
    Set User Password

    Fixed disk boot sector:          [Normal]
    Password on boot:                [Disabled]




    F1    Help     ↑↓   Select Item     -/+    Change Values        F9    Setup Defaults
    Esc   Exit     ↔    Select Menu      Enter  Select ▶ Sub-Menu    F10   Previous Values
```

Supervisor Password Is

Displayed as "Set" when the password is set. Since no password has been set at factories, the factory default setting is [Clear].

User Password Is

Displayed as "Set" when the password is set. Since no password has been set at factory, the factory default setting is [Clear]. Note that BIOS setting is not allowed with a User Password.

Set Supervisor Password / Set User Password

Specifies a password. When any password is not needed, do not input any values in the new password setting and press just the [Enter] key.

Fixed disk boot sector

Specifies whether writing into the boot sector on the hard disk is not allowed. Select from [Normal] or [Write Protect]. The factory default setting is [Normal].

Password on boot

Specifies whether a password should be needed at the Start-Up. Select from [Enabled] or [Disabled]. The factory default setting is [Disabled].

2.2.5 Boot

Specifies an order for boot-up devices. The boot-up devices are specified in the Boot priority order list and are searched for from the top of the list in sequence. By using the [+] or [-] keys, change its order. To change the device to be booted up, use the [x] key to move the device from the Boot priority order list to the Excluded from boot order list and vice versa.

> **NOTE**
> • When a new hard disk or commercial USB memory which does not require boot-up is connected and such a device is given high priority in the Boot priority order list, the system may not boot up properly. Be sure to check the order of the devices in the Boot priority order list after you connect a new device.

```
            PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
     Main    Advanced   Intel   Security   Boot   Exit

                                                         Item Specific Help
      Boot priority order:
       1:  IDE 0:
       2:  IDE 1:
       3:  USB FDC:
       4:  USB CDROM:
       5:  USB HDD:
       6:
       7:
       8:
      Excluded from boot order:
        :  IDE 2:
        :  Other USB:
        :  PCI LAN:  Realtek Boot Agent
        :  PCI LAN:  Realtek Boot Agent
        :  PCI SCSI:
        :  PCI:




     F1   Help    ↑↓  Select Item    -/+   Change Values     F9   Setup Defaults
     Esc  Exit    ↔   Select Menu    Enter Select ▶ Sub-Menu F10  Previous Values
```

Boot priority order

Specifies the order of the boot-up devices. The factory default settings are as follows:

1:	IDE 0	: Primary Master Device
2:	IDE 1	: Primary Slave Device
3:	USB FDC	: USB Floppy Disk Driver
4:	USB CDROM	: USB CDROM Driver
5:	USB HDD	: USB Memory, etc.
6:		
7:		
8:		

Exluded from boot order

:	IDE 2	:	Secondary Master Drive
:	Other USB	:	Other USB media
:	PCI LAN	:	LAN 1 (10/100Base Ether) PXE Boot ROM
:	PCI LAN	:	LAN 2 (GigaBit Ether) PXE Boot ROM
:	PCI SCSI	:	PCI SCSI Board
:	PCI	:	Other PCI device

2.2.6　Exit

```
                PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
   Main    Advanced   Intel   Security   Boot   Exit

                                                              Item Specific Help
     Exit Saving Changes
     Exit Discarding Changes

     Load Setup Defaults
     Discard Changes
     Save Changes
                                        [Normal]
                                        [Disabled]




   F1    Help     ↑↓  Select Item      -/+    Change Values       F9   Setup Defaults
   Esc   Exit     ↔   Select Menu      Enter  Select ▶ Sub-Menu   F10  Previous Values
```
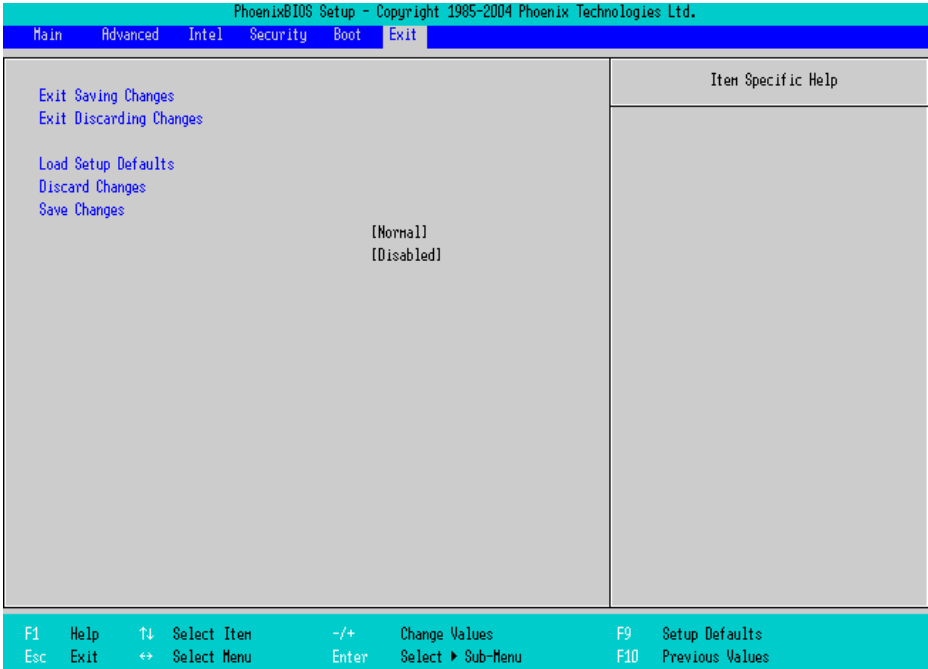
Exit Saving Changes

Point the cursor to the [Exit Saving Changes] on the [Exit] menu and press the [Enter] Key, the current

configuration is saved and the setting procedure is ended.

Exit Discarding Changes

Point the cursor to the [Exit Discarding Changes] on the [Exit] menu and press the [Enter] Key, the current

configuration is NOT saved but the setting procedure is ended.

Load Setup Defaults

Point the cursor to the [Load Setup Defaults] on the [Exit] menu and press the [Enter] Key, all of the current

configuration is back to the factory default settings.

Discard Changes

Point the cursor to the [Discard Changes] on the [Exit] menu and press the [Enter] Key, the current modified

configuration is canceled and the previous setting values are reloaded.

Save Changes

Point the cursor to the [Save Changes] on the [Exit] menu and press the [Enter] Key, the current configuration

which you modified is saved.

3 | PS-A Monitoring Features

This chapter describes various ways to monitor the status of the PS-A.

3.1 RAS Features

3.1.1   RAS Features

■ Errors which can be Detected by RAS Features

RAS, which stands for Reliability, Availability, and Serviceability, is a device-level monitoring function that provides a variety of features to improve the reliability of your PS-A system.

Though the standard set of RAS features used will vary depending on the devices used, the following features are used to provide Alarm Monitoring and External Input Signal support.

NOTE
- For the setting procedures for the RAS features, refer to the following.

    SEE → *3.8 Setup Guide (page3-23)*

Alarm Monitoring	Power Voltage Alarm
	    Monitors the status of the PS-A unit's built-in power supply and internal
	    CPU power supply.
	Cooling Fan RPM Alarm (PS-3450A only)
	    Monitors the CPU cooling fan RPM speeds.
	Internal Temperature Alarm
	    Monitors the internal temperature of the PS-A unit and the ambient
	    temperature of the CPU.
	Watchdog Timer Timeup
	Touch Panel Alarm
	    Monitors the status of the touch panel.
	Backlight Alarm
	    Monitors the status of the backlight.
	SMART Alarm
	    Monitors the status of the hard disk. Detects a warning of trouble of the
	    hard disk.

IMPORTANT
- An administrator Authentication is required for executing SMART Monitoring.
- A CF card doesn't support SMART and therefore the status of the CF card cannot be monitored.
- When a hard disk except options made by Pro-face is used, the operation of SMART Monitoring cannot be guaranteed.

■ Error Notification

The PS-A supports the following various processing functions to handle the alarm statuses previously listed.

Various Processing Functions	**LED Indicator (3 colors, 1 lamp)** The three-color LED on the front face is used to indicate the PS-A system conditions. It is also used as a power ON/OFF indicator. (**SEE→**) ◆ *LED Indicator (page3-5)* **Pop-up Message Output** This feature displays the system status via a Windows® pop-up message. **Buzzer Output** This feature uses the PS-A unit's built-in speaker to alert the operator about the system status. **System Shutdown** This feature shuts down the PS-A unit's OS. **System Reset** This feature resets the system when the Watchdog Timer reaches "time up".

Use the included System Monitor feature (utility software) to enable/disable the monitoring features and to set the alarm processing details.

(**SEE→**) *3.3 Monitoring the PS-A Status (page3-8)*

In addition, you can use the included dynamic link library (API-DLL) to access the RAS features from user-created applications.

(**SEE→**) *Otasuke Pro! "PS-345XA Series Reference Manual"*
URL http://www.pro-face.com/otasuke/

■ RAS Feature Overview

System Monitor

System Properties *1

Voltage, Fan RPM[3], Temperature Alarm
Detection Level Settings
Enable/Disable Settings
SMART Alarm, Power Alarm, Fan Alarm[3],
Internal Temperature Alarm, Output Settings,
Watchdog Timer Value Settings,
Watchdog Reset Enable/Disable Settings

Popup Message *2

OS Shutdown *2

User Application

System Monitoring Application

Driver or API-DLL

WDT Reset Mask Settings

Watchdog Timer

Reset Control

Hardware Reset

Buzzer *2

LED *2

Grenn : Power ON
Orange : RAS Error /
          Touch Panel Self-Test Error
Orange/Red Brinking : Backlight Error
Green Brinking : Soft OFF status

Hardware

*1   Be sure to adjust these settings according to your system's specifications.

SEE→   *3.3 Monitoring the PS-A Status (page3-8)*

*2   Output via the RAS feature.

*3   The PS-3451A has no fans.

■ Errror Notification

The method for notifying or handling errors can be selected from the following:

◆ LED Indicator

LED Color	System Status	output condition
Green (Lit)	Normal Operation (Power is ON)	None
Green (Blinking)	System is NOT running (Soft OFF)	None
Orange (Lit)	A RAS error occurred	LED setting is enabled in the system monitor properties.
	Touch Panel Self-Test Error	None
Orange/Red (Blinking)	Backlight Error	None
Not Lit	Power is OFF	—

◆ Pop-up Message Output

This feature displays system status via a Windows® pop-up message.

System Monitor Property is used to enable or disable this feature.

◆ Buzzer Output

This feature uses the PS-A unit's built-in speaker to alert the operator about the PS-A system status.

System Monitor Property is used to enable or disable this feature.

◆ System Shutdown

This feature shuts down the PS-A unit's OS.

System Monitor Property is used to enable or disable this feature.
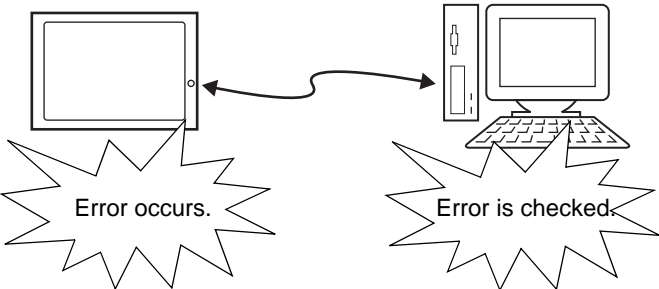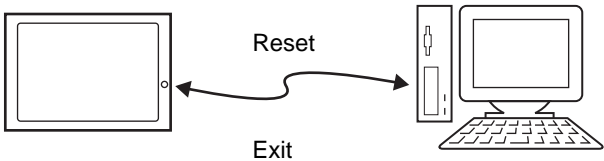
◆ System Reset

This feature resets the system when the Watchdog Timer reaches "time up".

System Monitor Property is used to enable or disable this feature.

3.2 Setting Menus

Monitoring the PS-A Status

E.g. Temperature error occurs.

Error!

The occurrence of the error is displayed.

☞ Description (page3-8)

☞ Setup Procedure (page3-8)

Checking the Status of the PS-A Being Monitored

System Monitor

+5.0V   Pass

+12V   Pass

VcoreA Pass

☞ Description (page3-12)

☞ Setup Procedure (page3-12)

Checking the Error Log List

Error 2007/6/19 10:04:12

Error 2007/6/19 12:15:24

Error 2007/6/19 15:36:08

☞ Description (page3-13)

☞ Setup Procedure (page3-14)

Monitoring Errors from a Remote Server

Using Pro-Server with Pro-Studio or via the network

Error occurs.

Error is checked

The error can be checked even from a remote office.

☞ Description (page3-16)

☞ System Configuration (page3-17)

☞ Monitoring using Pro-Server with Pro-Studio or Pro-Server EX (page3-20)

Restarting/Shutting Down the PS-A from a Remote Server

Via the network

Reset

Exit

Remote operation from an office in a different location

☞ Description (page3-22)

☞ Setup Procedure (page3-22)

3.3 Monitoring the PS-A Status

3.3.1 Description

Error occurs.   The occurrence of the

error is displayed.
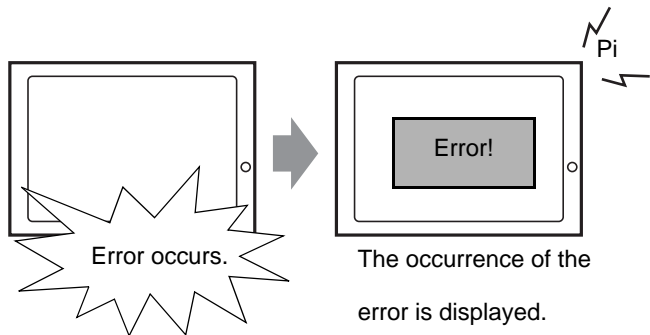
Before starting the setup procedure, specify the items you want to monitor with the RAS features.

When an error occurs, notification is provided according to the specified method.

3.3.2 Setup Procedure

NOTE

• For details about the setup procedure, refer to the Setup Guide.

SEE→   *3.8.2 Setup Guide for the System Monitor Screen (page3-26)*

This section describes the procedure to set the PS-A to monitor a temperature error and provide notification

with a buzzer and pop-up message.

(1) Double-click [System Monitor Property] in [Control Panel] to display the [System Monitor Property]

screen.

(2) Select the [Temperature] tab.
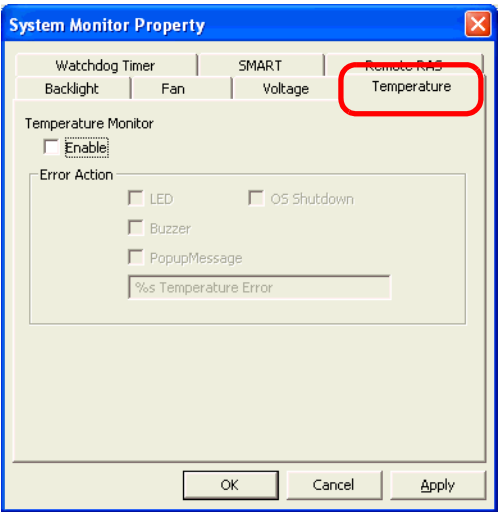
(3)　Check [Enable].
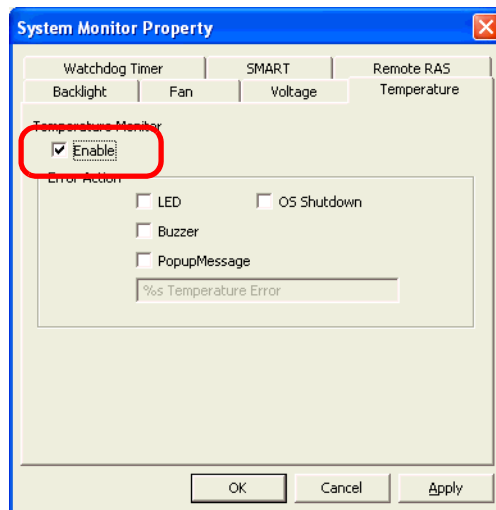
(4)　For [Error Action], check [Buzzer] and [PopupMessage].
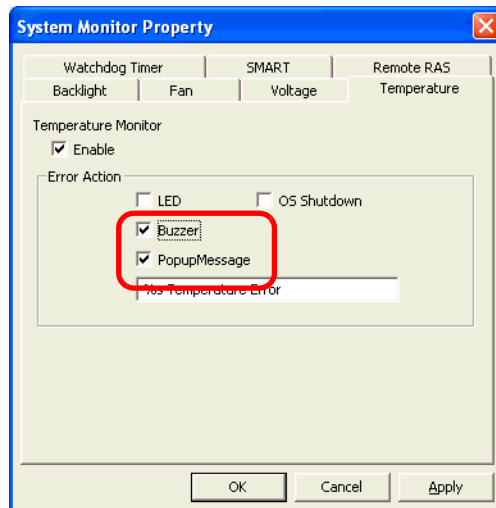
(5)　Click [Apply].

(6)　Click [OK] to complete the setting.

When the monitoring starts, the System Monitor icon appears in the task tray.

NOTE

• System Monitor also operates as Windows's Services. When System Monitor applications do not start, the System Monitor Service execute the RAS events setup in the System Monitor Property. You can check the System Monitor Service's operation state by selecting [Control Panel] -> [Administrative Tools] -> [Services].
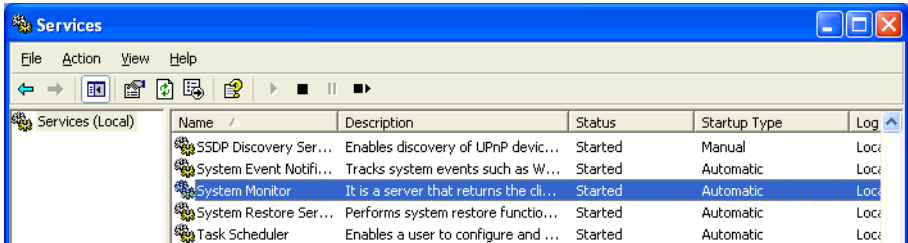
• The pop-up message displayed when the System Monitor Service detects an error differs from ordinary ones.

■ When an Error Occurs

    (1)   A buzzer sounds and a pop-up message is displayed.
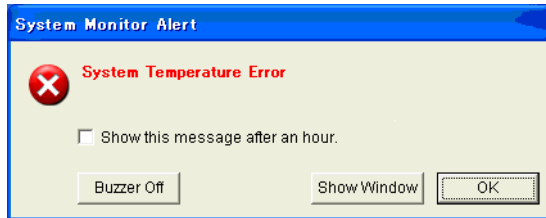
<div style="border:1px solid">NOTE</div>

• The Error Action is performed only one time when an error is detected for each monitoring item.

• To stop the buzzer, click the [Buzzer Off] button in the pop-up message dialog box.

    If the pop-up message is hidden, click the [Buzzer Off] button displayed in the [System Monitor] screen.

• You can also display the [System Monitor] screen by pressing [Show Window] on the pop-up message window.

• When you check the [Show this message after an hour] check box and press the [OK] button, the pop-up message window will close and will not open for an hour.

    (2)   An "×" mark appears on the icon in the System Tray, which indicates an error status, and the icon blinks. You can see the description of the error by double-clicking the icon.
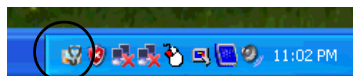
Icon display on start-ups   Icon display when an error is detected.
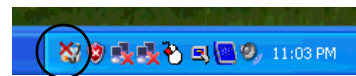
<div style="border:1px solid">IMPORTANT</div>

• Once an error is detected, the System Monitor holds the "error" status (Icon display indicating error detection). To recover from the error status, press the [Reset] button on the [System Monitor] screen or turn off the PS-A. After that, perform maintenance service for removing the cause of the error factor, and then turn on the power again.

3.4 Checking the Status of the PS-A Being Monitored

3.4.1 Description
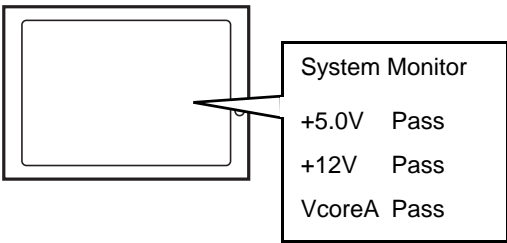
Check the status of the PS-A being monitored with the RAS features from the System Monitor screen.

You can also use this screen to check error details.

3.4.2 Setup Procedure

NOTE
• For details about the setup procedure, refer to the Setup Guide.

SEE→ *3.8.2 Setup Guide for the System Monitor Screen (page3-26)*

(1) When the System Monitor starts, the System Monitor icon appears on the task bar. Double-click the System Monitor icon to display the System Monitor screen.
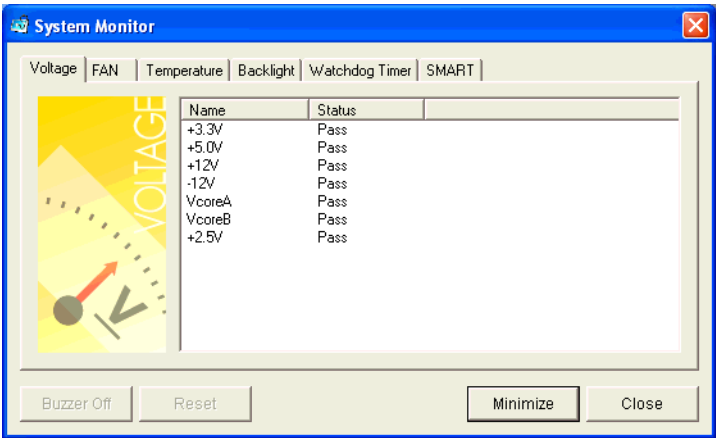
(2) Click the tab of the item you want to check.

NOTE
• When an error occurs, the color of the corresponding tab changes.

• As for Device No. of SMART, [0] means Master and [1] means Slave.

3.5 Checking the Error Log List

3.5.1 Description

Error	2007/6/19 10:04:12
Error	2007/6/19 12:15:24
Error	2007/6/19 15:36:08
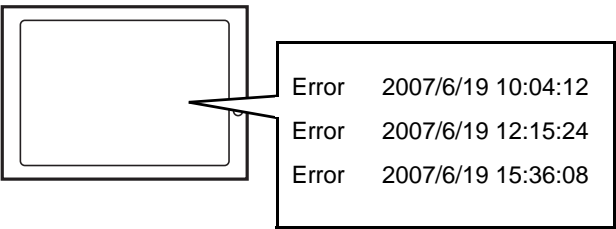
Check the location and action of the previous error on the Event Viewer screen.

3.5.2 Setup Procedure

(1) Select [Control Panel] - [Administrative Tools] - [Event Viewer] to display the Event Viewer screen.

Select [System] to display the system log list.

NOTE • The OS Restart from a Watchdog Timer Error and the reset input for the RAS port cannot be logged.
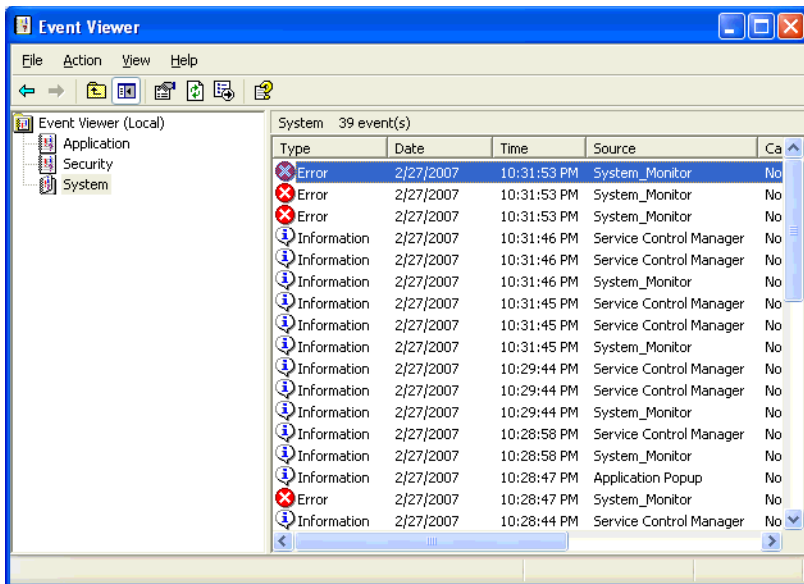
(2) Error logs can be recognized by [System Monitor] displayed in the Source column.

Select the row of the error log you want to check and double-click it.
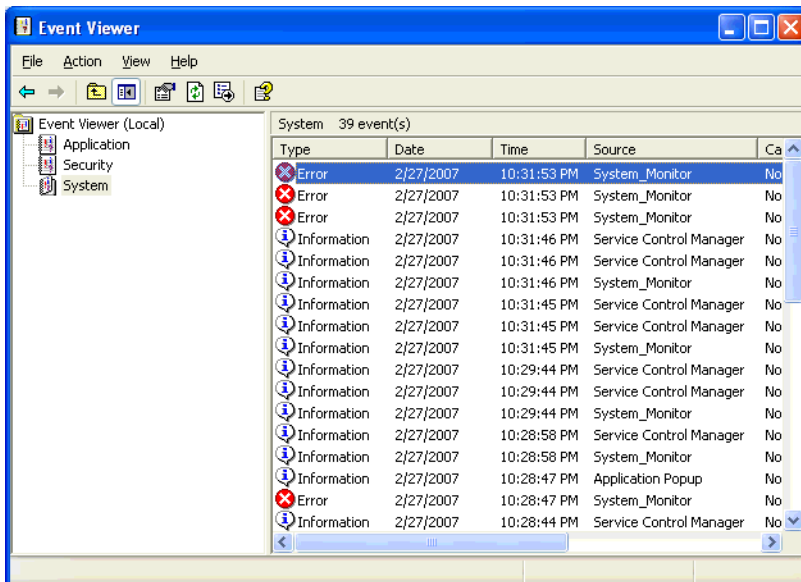
(3)   The [Event Properties] screen appears.

The error message is displayed in the [Description] area.
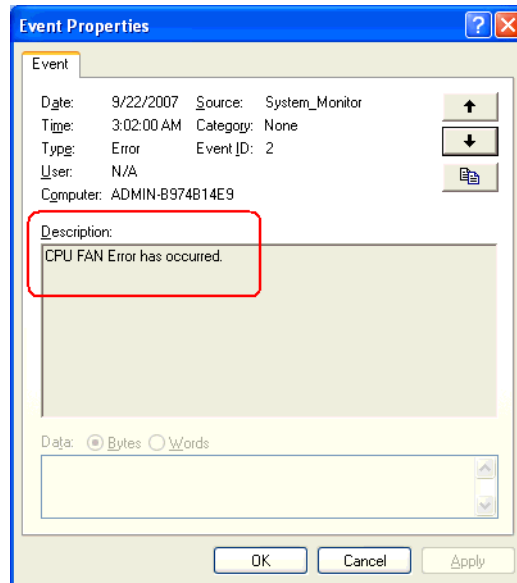
3.6   Monitoring Errors from a Remote Server

3.6.1   Description

Using Pro-Server with Pro-Studio or via the network

Error occurs.

Error is checked.
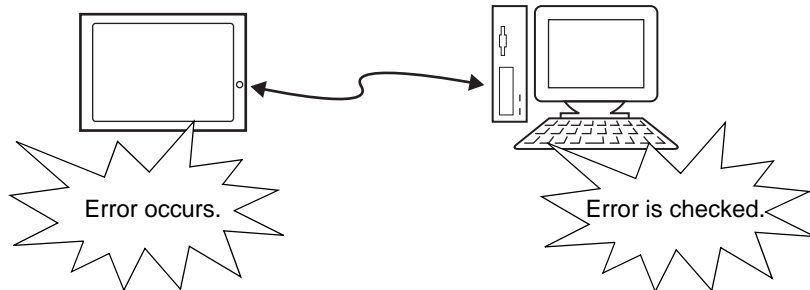
Monitor and control the System Monitor/RAS features remotely via the host PC in which Pro-face's Pro-Server with Pro-Studio (optional) or Pro-Server EX (optional) is installed.

To use this feature, you need Pro-Server with Pro-Studio Ver. 3.12 or higher, or, Pro-Server EX Ver.1.20 or higher. Please also refer to the manuals of the Pro-Server.

SEE →   *3.6.3 Monitoring using Pro-Server with Pro-Studio or Pro-Server EX (page3-20)*

Even in an environment where Pro-Server with Pro-Studio is not installed on the host PC, the RAS monitoring is available via the network.

3.6.2　System Configuration

The system employing this feature is configured as illustrated below.

Server PC

User Application

Pro-Server with Pro-Studio Ver. 3.12 or higher,
or Pro-Server EX Ver. 1.20 or higher
Remote RAS Server Program (IPC_RAS.npj)

Two-way feature

Ethernet

Client PS-A

[System Monitor/RAS Feature]
• SystemMonitor.exe
• System Monitor Property
• Ioctl.dll
• Smonras.dll
• Blioctl.dll
• Sysmon.sys
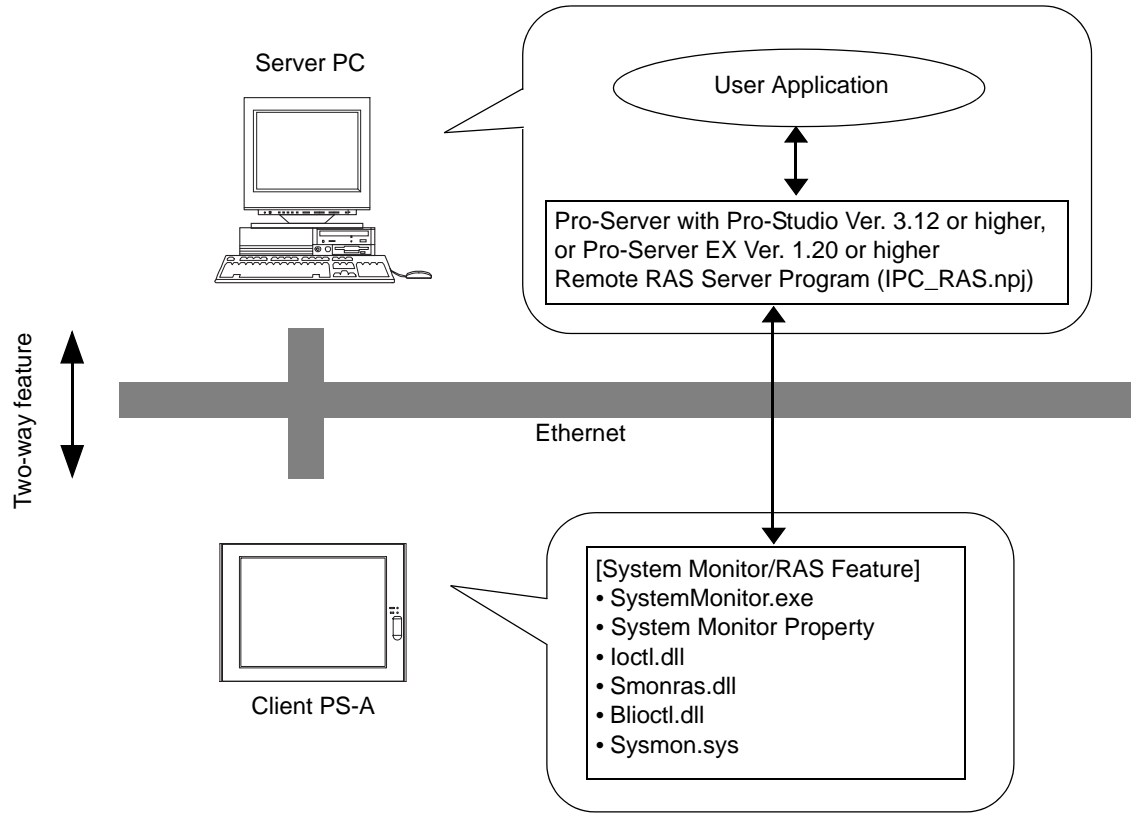
The status of the System Monitor/RAS feature is transferred to the Pro-Server via Ethernet from the System-Monitor.exe. The RAS feature including voltage, FAN, and temperature etc., can be monitored by monitoring the device addresses assigned from the Pro-Studio.
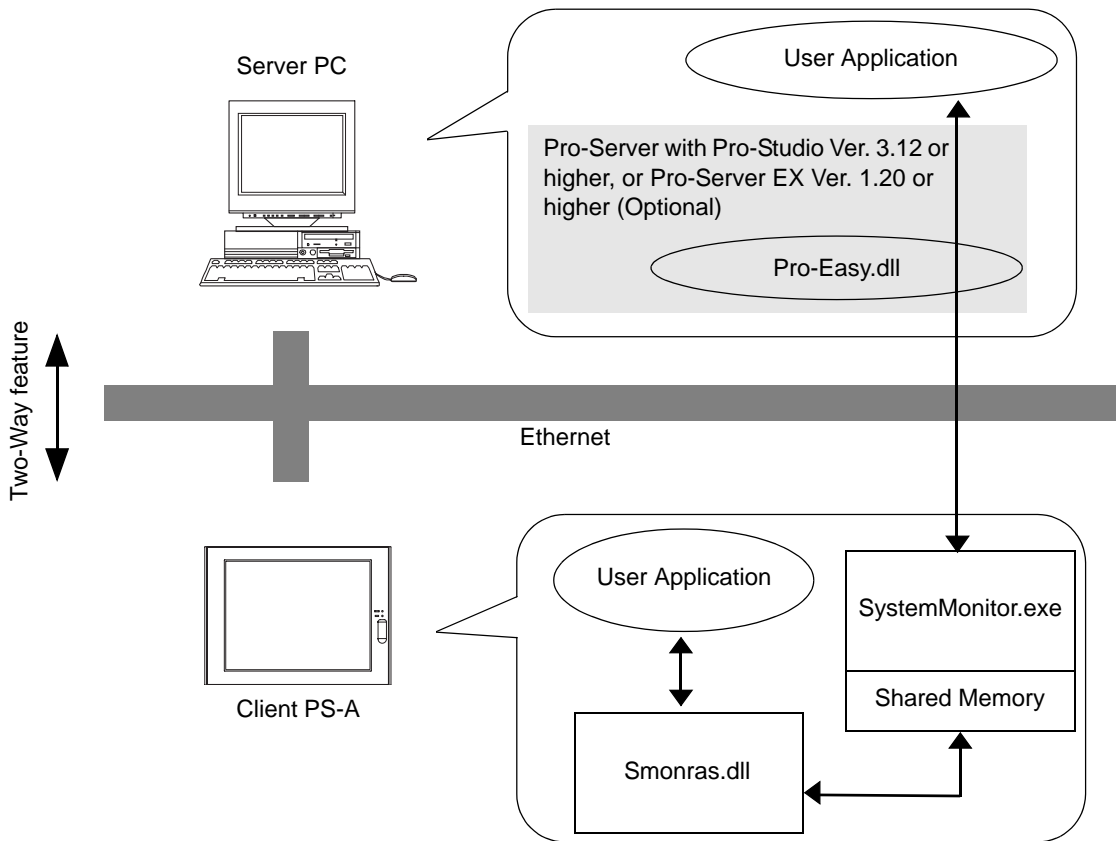
The user applications in the server PC monitors the RAS feature through the Pro-Easy.dll program provided from the Pro-Server.

The client PS-A shares the data with the user applications on the server PC by using the shared memory. The data transfers on both sides are processed via the Smonras.dll and Pro-Easy.dll programs.

■ List of Device Addresses

Device	Device Type	Device Symbol	Read/ Write	Bit Access	16-bit Access	32-bit Access
VcoreA Voltage[1]	WORD	VLT	Read	-	VLT0	-
VcoreB Voltage[1]	WORD				VLT1	
+3.3V Voltage[1]	WORD				VLT2	
+5.0V Voltage[1]	WORD				VLT3	
+12V Voltage[1]	WORD				VLT4	
+2.5V Voltage[1]	WORD				VLT5	
-12V Voltage[1]	WORD				VLT6	
Number of Revolution of System FAN [2]	WORD	FAN			FAN0	
System Temperature [3]	WORD	TMP			TMP0	
System2 Temperature	WORD				TMP2	
CPU Temperature [3]	WORD				TMP1	
Error Event	WORD	ERR	Read	ERR00-ERR0E	ERR0	
Internal Memory Area [4]	WORD	LS	Read/ Write	LS00000-LS0000F to LS02550-LS0255F	LS0000 to LS0255	LS0000 to LS0254
Shared Memory	WORD	PL		PL00000-PL0000F to PL02550-PL0255F	PL0000 to PL0255	PL0000 to PL0254
Software Reset Port [5]	WORD	RST	Read/ Write	-	RST0	-
Error Mask [6]	WORD	ERRM	Read	ERRM00-ERRM0E	ERRM0	-

*1　When monitoring the voltage with the device monitor, the unit is "mV".

*2　When monitoring the number of revolutions with the device monitor, the unit is "rpm".

*3　When monitoring Temperature with the device monitor, the unit is "°C".

*4　Used for only the system to read/write the data and perform monitoring operation.

*5　Shuts down and restarts the operation system on the client PS-A.

*6　Indicates the error event that is being monitored by the PS-A.

IMPORTANT

• When "Forced Shutdown" or "Forced Reboot" is written to the device address, the system automatically shuts down/restarts the operation system without prompting the confirmation for saving the data on current applications.

Take extra cautions when performing write operation in order to avoid accidental data loss.

Value to be Written		Operation
Decimal Number	Hexadecimal Number	
1	0001	Shutdown
2	0002	Reboot
257	0101	Forced Shutdown
258	0102	Forced Reboot

3.6.3   Monitoring using Pro-Server with Pro-Studio or Pro-Server EX

■ Setting Up the Client PS-A

(1)   Double-click [System Monitor Property] in [Control Panel] to display the [System Monitor Property] screen.

(2)   On the [Remote RAS] tab, put a check mark in the [Enable] checkbox.

NOTE   • For details about the setup procedure, refer to the Setup Guide.

(SEE→)   ■ *Remote RAS (page3-24)*

• In order to actually activate the Remote RAS feature, you are required to start up the System Monitor (SystemMonitor.exe) within the PS-A.

(3)   Click [Apply].

Click [OK] to exit the [System Monitor Property] screen.
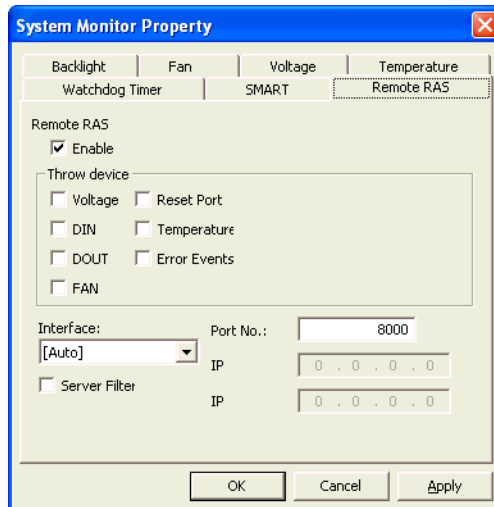
■ Setting Up the Server PC

(1)   On the server PC, download the software from the Pro-face support site "Otasuke Pro!". Follow the

attached instructions to copy the downloaded file to the designated file.

(2)   Start up the Pro-Studio.

(3)   Register the PS-A you want to include in the network to the network station, and edit the participant sta-

tions.

SEE→   *Pro-Server with Pro-Studio for Windows Operation Manual*

Pro-Server EX Reference Manual

NOTE   •   When using the Pro-studio's [Find Stations] command to register the PS-A to the network station,

the System Monitor should be activated with the Remote RAS feature enabled in the PS-A.

(4)   Select [PL, PS-A, PS-B] for the PLC type on the network station editing.

(5)   Register the symbol. Refer to the following for the symbols that can be registered.

SEE→   ■*List of Device Addresses (page3-19)*

NOTE   •   You are not required to transfer the network project file created with the Pro-Studio to the client

PS-A.

3.7 Restarting/Shutting Down the PS-A from a Remote Server

3.7.1   Description
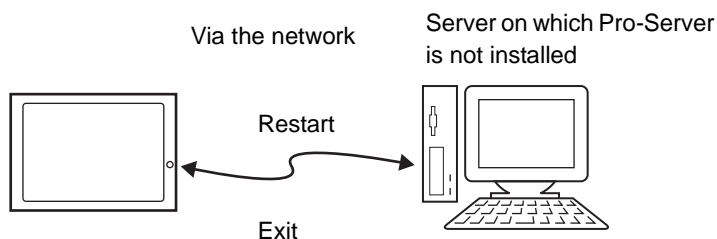
Restart or shut down the PS-A unit from a server on which Pro-Server is not installed.

3.7.2   Setup Procedure

(1)   From the Pro-face support site "Otasuke Pro!", download the installer for the application which is required for this feature.

http://www.pro-face.com/otasuke/

(2)   Start the installer and then select the server application and client application. Follow the instructions displayed on the screen to install the applications.

(3)   The installed applications are stored in the following folder.

File Name	Folder (Same for both Windows® XP and Windows® 2000)
PSClt.exe	C:\Proface\Shutdown\Client
RSSvr.exe	C:\Proface\Shutdown\Server

NOTE

- For the operation procedure of this feature, refer to the online help of the Remote Shutdown Application.
- Both applications (for server and client) can be installed on the PS-A to achieve self-control system. In such a case, however, the PS-A should be connected to a network.
- If the Remote Shutdown feature is executed, the PS-A unit will be in the Soft OFF Status. (Power is still supplied to a part of circuits.)

3.8 Setup Guide

3.8.1 Setup Guide for the System Monitor Property Screen

The following table lists the operating settings that can be configured for each feature.

O: Setting available X: Setting not available

Feature	Operation				
	Buzzer	Popup Message	OS Shutdown	Restart	LED
Watchdog Timer	O	O	O	O	O
Voltage	O	O	O	X	O
Fan	O	O	O	X	O
Temperature	O	O	O	X	O
SMART	O	O	X	X	O
Backlight	O	O	X	X	O

IMPORTANT

- Administrator Authentication is required for executing SMART Monitoring. When a user who does not have the administrator authentication logs in, nothing is displayed in the item of SMART.

■ Remote RAS

Item	Operation
Enable	When this option is checked, the remote RAS feature starts.
Throw device	Specifies the item(s) to be monitored.
Interface	Specifies the IP address used for the connection with the Pro-Server. **NOTE** • When 2 or more IP Addresses are allocated to the PS-A unit, the [Auto] cannot be selected. Enter settings that allow the reading of a fixed IP Address from a DHCP server. For details, contact your company's network administrator for getting the detailed information.
Server Filter	Check this option to communicate only with the server with a specific IP address.
Port No	Specifies the port No. of the server to communicate with.
IP Address 1	Specifies the IP address of the server to communicate with.
IP Address 2	Specifies the IP address of the server to communicate with.

■ Watchdog Timer
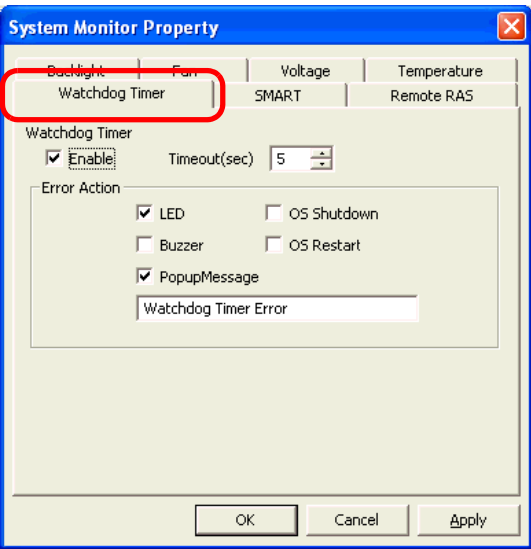
Item	Operation
Enable	When this option is checked, the Watchdog Timer is enabled.
Timeout(sec.);	Specifies the timer duration.
Error Action	Specifies the action(s) taken when the System Monitor detects that the allowable range is exceeded.
Pop-up Message	When [PopupMessage] is specified as an action, the characters entered in the field (e.g. Watchdog Timer Error) are displayed as a popup message.

3.8.2   Setup Guide for the System Monitor Screen

You can check the status of the PS-A being monitored.

Click the tab of the item you want to check.

■ Voltage

NOTE	• The Temperature tab displays the same items as the Voltage tab.
	• The Backlight and Watchdog Timer tabs display [Status] only.
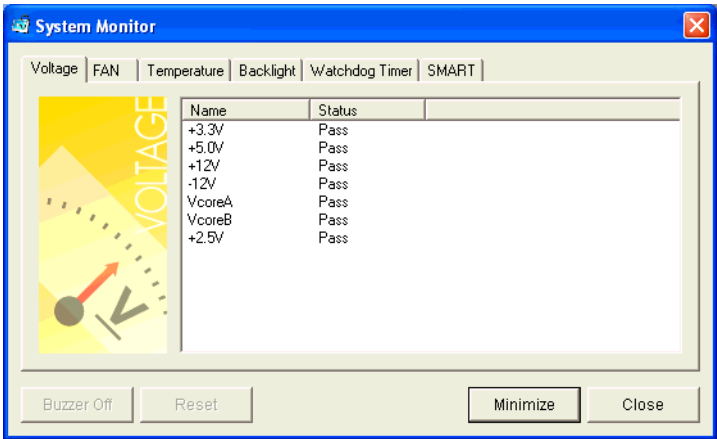
Item	Operation
Name	Displays the monitoring item.
Status	Specifies the item to be monitored. The status of each monitoring item is displayed. [Pass]: Normal [Fail]: Abnormal [Disable]: Not monitored
Buzzer Off	When [Buzzer] is selected for the error notification method, you can stop the buzzer by clicking [Buzzer Off].
Reset	When an error is detected, clicking [Reset] recovers the System Monitor from the "error" status.
Minimize	Stores the System Monitor screen in the task tray.

■ SMART

Item	Operation
Device No.	Displays the number assigned to the hard disk to be monitored.
Model	Displays the model of the hard disk.
Status	Specifies the item to be monitored. The status of each monitoring item is displayed. [Pass]: Normal [Fail]: Abnormal [Disable]: Not monitored [Not Support]: Not supported • [Not Support] is displayed when a device like a CF card, which does not support SMART, is detected.
Reset	When an error is detected, clicking [Reset] recovers the System Monitor from the "error" status.
Minimize	Stores the System Monitor screen in the task tray.

3.9   Error Messages

■ Alarm Pop-up Messages

When an error occurs while the "Popup Message" option is enabled for Error Action, the following messages

appear on the pop-up message output screen under the factory settings.

Error Type	Message
VcoreA	VOLT VcoreA Power Supply Error
VcoreB	VOLT VcoreB Power Supply Error
Voltage +2.5V	VOLT +2.5V Power Supply Error
Voltage +3.3V	VOLT +3.3V Power Supply Error
Voltage +5.0V	VOLT +5.0V Power Supply Error
Voltage +12.0V	VOLT +12V Power Supply Error
Voltage -12.0V[*1]	VOLT -12V Power Supply Error
System FAN[*1]	FAN System Fan Error
CPU Temperature	TEMP CPU Temperature Error
System Temperature	TEMP System Temperature Error
System2 Temperature	TEMP System2 Temperature Error
Watchdog	Watchdog Timer Error
Backlight	Backlight Blowout Error
SMART	SMART Error

*1: PS-3450A Only
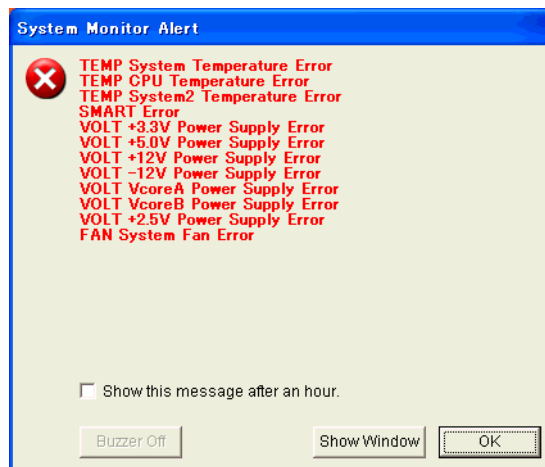
> **NOTE**
>
> • The messages displayed on the pop-up message output screen can be modified on the System
>
> Monitor Property screen.
>
> SEE→ *3.3.1 Description (page3-8)*

■ Error Messages Displayed on the Event Viewer Screen

The error types/locations shown by the Event Viewer are as follows.

Error Type	Message
VcoreA	VOLT VcoreA Error has occurred.
VcoreB	VOLT VcoreB Error has occurred.
Voltage +2.5V	VOLT +2.5V Error has occurred.
Voltage +3.3V	VOLT +3.3V Error has occurred.
Voltage +5.0V	VOLT +5.0V Error has occurred.
Voltage +12.0V	VOLT +12.0V Error has occurred.
Voltage -12.0V[*1]	VOLT -12.0V Error has occurred.
CPU Temperature	TEMP CPU Error has occured.
System Temperature	TEMP System Error has occured.
System2 Temperature	TEMP System2 Error has occured.
System FAN[*1]	FAN System Fan Error.
Watchdog	Watchdog Timer Error has occurred.
Backlight	Backlight Error has occurred.
SMART	SMART Error has occurred. Attribute (No.)(Attribute Name) Device (No.)(HD Model). The descriptions in the parentheses vary depending on details of occurring errors and the device where errors occur (0:Master, 1:Slave).

*1: PS-3450A Only

◆ Error Action

NOTE	• The data shown in the table's "□□" indicate the error type/location.
	• The actions to be taken after an error occurs are set via the System Monitor Property screen.

Error Action	Error Message
Buzzer	Buzzer has sounded because of □□ error.
Popup Message	Popup Message has been shown because of □□ error.
OS Shutdown	Window has been shut down because of □□ error.

■ Error Messages Displayed during Device Reading/Writing

Error Code		Error Message
Decimal Number	Hexadecimal Number	
9530	253Ah	RAS Initialization Error
9531	253Bh	Command not supported.
9532	253Ch	Access type not supported.
9533	253Dh	Read/Write type not supported.
9534	253Eh	Access to the device is rejected.
9535	253Fh	Value setting to the device/retrieval failed.
65535 (No Code)	FFFFh	Returned when read/write of invalid values or unsupported device is performed for Voltage, Temperature, and number of revolution of the FAN.

For error messages other than listed above, refer to "Pro-Server with Pro-Studio for Windows Operation Manual".

3.10 Restrictions

■ Supported Pro-Server Features

The following table lists the features of the Pro-Server that are supported by the PS-A. For the details of each feature, refer to "Pro-Server with Pro-Studio for Windows Operation Manual".

Pro-Server Feature	O: Supported X: Not Supported
DDE Feature	O
Simplified DLL Feature (ProEasy.dll)	(SEE→) ■ *Supported Simplified DLL Features (page3-31)*
OPC Server Interface	O
Data Transfer Feature	O
SRAM Backup Data	X
Action Feature	X
Distribution Feature	X
Data Viewer	O[1]
VBA Feature Assist	O
Device Data Backup/Restore Feature	O
Capture Screen Save Feature	O
Security Feature	O
Device Monitor	O
Status Monitor	X
Read Time Measurement	O

*1: Pro-Server with Pro-Studio for Windows Ver. 4.0 or higher is required.

■ Supported Simplified DLL Features

The simplified DLL features supported by the PS-A are as follows:

- Direct Read Function
- Direct Write Function
- Cache Read Function
- Retrieval of Multithreading Handle
- Release of Multithreading Handle
- Loading of Network Project File
- Error Code String Conversion.
- Participant Station Status Readout Function
- Initialization of Simplified DLL
- Termination of Simplified DLL

NOTE
- Note that the PS-A-supported OS and features supported by Pro-Server are different.
- When using the Remote RAS feature together with Pro-Server in PS-A, be sure to select different port numbers.

4 | Troubleshooting

1. Problems and Countermeasures
2. Recovery Procedure

This chapter describes the countermeasures for problems with the PS-A and the recovery procedure for the OS.

4.1   Problems and Countermeasures

Problem	Countermeasure and reference page
Nothing appears on the screen.	Is the power cable connected properly? **(SEE →)** *PS-3450A/3451A Hardware Manual* *3 Hardware Installation*
	Is the power supply/voltage within the range of the specifications? **(SEE →)** *PS-3450A/3451A Hardware Manual* *2 Specifications*
	Is the backlight lit? If the backlight is burnt out, replace it. **(SEE →)** *PS-3450A/3451A Hardware Manual* *4 Maintenance*
	Does the status LED illuminate in green? **(SEE →)** *If the status LED does not illuminate, contact your local PS-A distributor.*
The OS does not operate properly.	Is [Type] in [Primary Slave] set to [Auto] in the IDE setting? **(SEE →)** ■ *Primary Master / Primary Slave / Secondary Master (page2-5)*
	Did you connect a new hard disk drive or commercial USB memory which does not require boot-up? **(SEE →)** *2.2.5 Boot (page2-28)*
The connected peripheral device does not work.	Is the power cable connected properly? **(SEE →)** *PS-3450A/3451A Hardware Manual* *3 Hardware Installation*
	Is the peripheral device connected properly? -> Refer to the manual for the connected device.
	Does the device require driver setup? -> Refer to the manual for the connected device and set the driver properly.
	Was the PS-A started with a USB device connected? -> If a USB device such as USB memory is connected to the PS-A when the PS-A is started, the following phenomenon may occur, depending on the device: • It takes about 1 minute before the OS starts up. • The PS-A does not recognize the USB device. These problems may be solved by setting [Power on Delay] to [Enable].

Problem	Countermeasure and reference page
The touch panel does not respond.	You need to install the touch panel driver when you use the PS-A with no pre-installed OS. **SEE →** ■ *Installing the Touch Panel Driver (Mouse Emulator) (page1-13)*
The touch panel does not respond even after the touch panel driver is installed.	If the touch panel does not respond even after the touch panel driver is installed, possible causes are: • The connected external device (including a keyboard and a mouse) may not be compatible with the PS-A. -> Disconnect the external device and check the touch operation. • A touch panel driver (or drivers) other than the driver downloaded from the Pro-face support site "Otasuke Pro!" is installed in the PS-A. -> Uninstall such a driver(s) and make sure that only the driver downloaded from "Otasuke Pro!" is installed in the PS-A. Then check the touch operation. • The touch panel driver setting has been changed. -> If the touch panel driver setting has been changed, touch actions may not work properly. Please contact your local PS-A distributor.
The touch position recognized in the touch panel deviates from the actual touch.	Have you calibrated the touch panel? **SEE →** ■ *Installing the Touch Panel Driver (Mouse Emulator) (page1-13)*
The touch position recognized in the touch panel still deviates from the actual touch even after calibration.	If the touch position still deviates after calibration, possible causes are: • There are flaws or unevenness on the surface of the PS-A. -> If the bracket securing the PS-A is tightened too much, flaws or unevenness may result. Release the PS from the bracket and check whether the problem continues. • The touch panel calibration was not finished properly. -> Uninstall the touch panel driver once, and then install the latest driver. The latest driver can be downloaded from the Pro-face support site "Otasuke Pro!". • The hardware in the touch recognition section is faulty. -> Use the PS-A that operates properly and check whether the same problem occurs. If the problem occurs only with a specific unit, contact your local PS-A distributor for repair or replacement.
I want to know what the LED indicator indicates.	**SEE →** ◆ *LED Indicator (page3-5)*
A Touch Panel Self-Test Error occurred.	The touch panel is faulty. Please contact your local PS-A distributor.

Problem	Countermeasure and reference page
"Delayed Write Failed" occurs frequently.	If some of the following coincide, the chance of an error in a file is increased. • A single file is accessed too often, such as being opened, read, or written. • The amount of installed memory is too small to secure enough cache memory. • File fragmentation is high. • The I/O load on the disk is high. • Delayed-write fails. Try the hard disk maintenance. If the problem continues, replace the hard disk.
I want to resume the PS-A from the standby and sleep statuses via LAN.	Set the PS-A as follows: 1. From the [Start] menu, select [Control Panel]. 2. Select [System]. (When you use Windows XP, you can find it in [Performance and Maintenance] in the Category View.) 3. On the [Hardware] tab, select [Device Manager]. 4. Expand [Network Adapter] and double-click [Realtek RTL8169/8110 Family Gigabit Ethernet NIC]. 5. On the [Power Management] tab, check [Allow the computer to turn off this device to save power.].
"CMOSCHECK SUM ERROR" occurred although I did not shut down or reboot the system.	The CMOS battery may become exhausted. Replace the battery. Note that the BIOS setting will be lost when the battery is removed. You need to configure the BIOS setting again after the battery replacement. (SEE→) *PS3450XA Series Hardware Manual* *4 Maintenance* The battery may become exhausted quickly in the following cases: • The temperature of the use environment suddenly changed from low to high. • The installed expansion board quickly consumes the CMOS battery.

4.2   Recovery Procedure

4.2.1   PS-A with no Pre-installed OS

Refer to the instruction manual for the installed OS and recover the OS.

After the OS is recovered, download drivers and utility software from the Pro-face support site "Otasuke Pro!".

SEE →   *1.2.2 Setting Up the PS-A Dedicated Software (page1-3)*

IMPORTANT   • Specify [Disabled] for the USB-Device29 and the Function7 of the BIOS when you install commercial Windows®, using a USB CD/DVD-ROM drive.

SEE →   ◆ *Integrated Device Control Sub-Menu (page2-23)*

4.2.2   PS-A with Pre-installed OS (Windows 2000)

IMPORTANT   • After performing hard disk recovery, the PS-A unit's hard disk is returned to its factory shipped condition.

• For recovery, a USB keyboard and USB CD-ROM drive (both on the market) are required.

Use the following steps used to recover the Windows® 2000 Multi-Language Pre-installed Hard Disk.

(1)   Turn on the power of PS-A and immediately press the [F2] key to enter the BIOS setup screen. Insert the Recovery media into the drive.

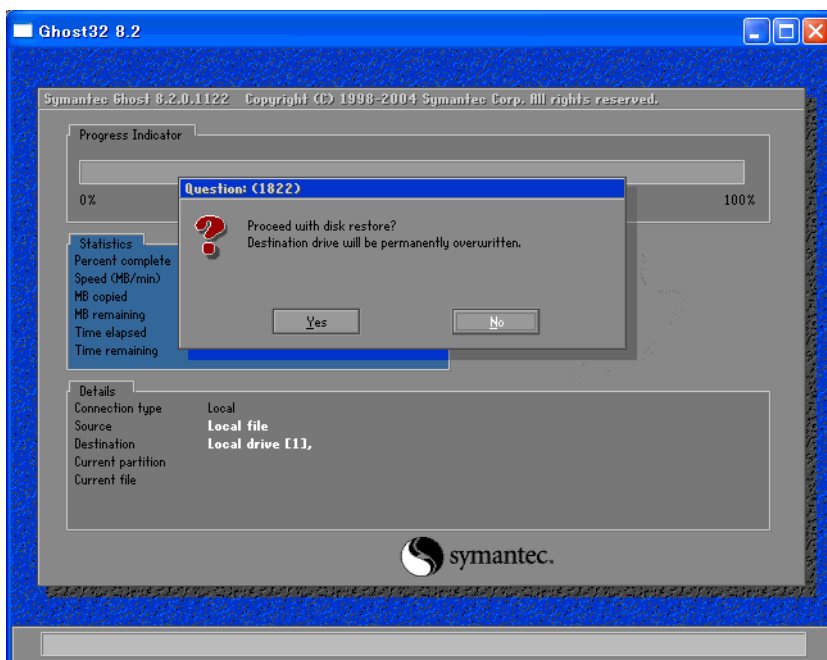(2)   On the [Boot] menu, move "USB CDROM" to the top of the screen using the [+] key or the [-] key.

(3)   Press the [F10] key and select [Yes] for [Save configuration changes and exit now?] to save the settings and restart the PS-A unit.

(4) After the PS-A unit restarts, the Symantec Ghost™ will automatically start.

(5) After the Symantec Ghost™ starts, the [Question] dialog box will appear.

"Partition sizes correct?"

(6) The volume displayed in New Size will be recovered. After confirming it, press the [Yes] button. To change it, press the [No] button and go to the [Destination Drive Details] dialog box. In the [Destination Drive Details] dialog box, change the size of the New Size and press the [OK] button.

(7) The [Question] dialog box will appear. Press the [Yes] button. It will be reconfirmed that the data of the hard disk is all reset to the original values at the time of delivery.

"Proceed with disk restore? Destination drive will be permanently overwritten."

(8)   The hard disk recovery program will start. After the recovery operation finishes, the Symantec Ghost™ also will finish. When the message "Please turn off computer" displayed, turn off the power of PS-A.

(9)   Turn on the power of PS-A again and immediately press the [F2] key to enter the BIOS setup screen.

(10)   Press the [F9] key and select [Yes] for [Load default configuration now?] to set the BIOS setting to the factory setting. Press the [F10] key to save the setting and restart the PS-A unit.

(11)   After the unit restarts, set up your OS.

(SEE→)   *1.3.1 Setting Up OS (page1-6)*

IMPORTANT
- If the hard disk unit breaks down due to a hardware problem, (Ex. if BIOS cannot find the hard disk, if the hard disk's lifetime expires, or it breaks down), Symantec Ghost™ cannot recover the hard disk. Pro-face recommends that in this case you contact your local PS-A distributor for instructions about hard disk recovery or replacement.
- Pro-face does not guarantee the preservation of any data stored on the HDD unit if the HDD unit has an accident, malfunctions or is damaged in any way. Therefore, the regular backing up of important HDD unit data to either floppy disks, or other type of suitable magnetic media is strongly recommended.

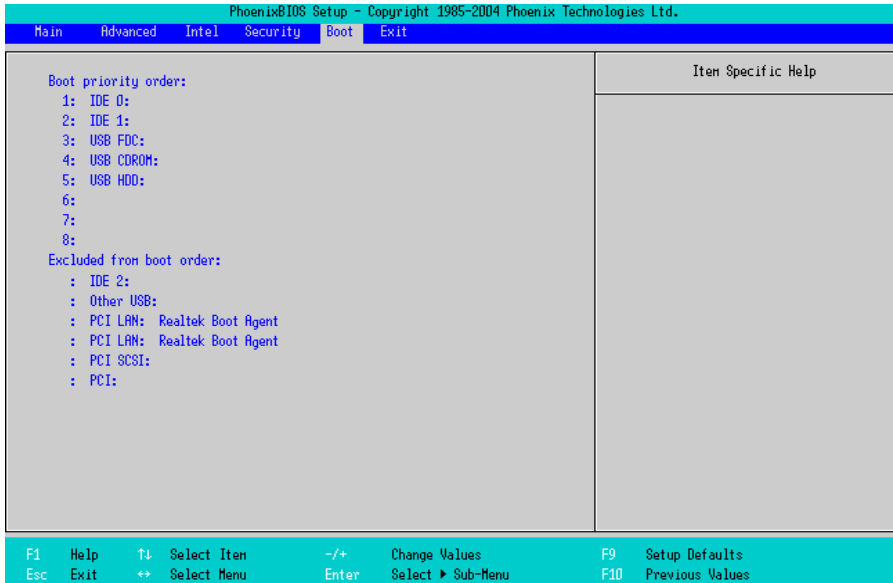## 4.2.3   PS-A with Pre-installed OS (Windows XP)

IMPORTANT
- After performing hard disk recovery, the PS-A unit's hard disk is returned to its factory shipped condition.
- For recovery, a USB keyboard and USB CD-ROM drive (both on the market) are required.
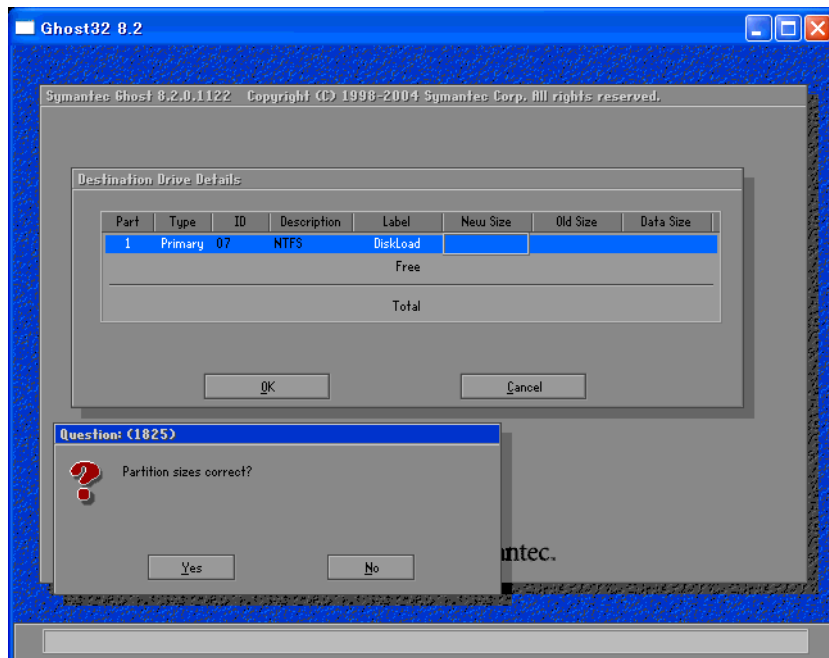
Use the following steps used to recover the Windows® XP Multi-Language Pre-installed Hard Disk.

(1)   Turn on the power of PS-A and immediately press the [F2] key to enter the BIOS setup screen. Insert the Recovery media into the drive.

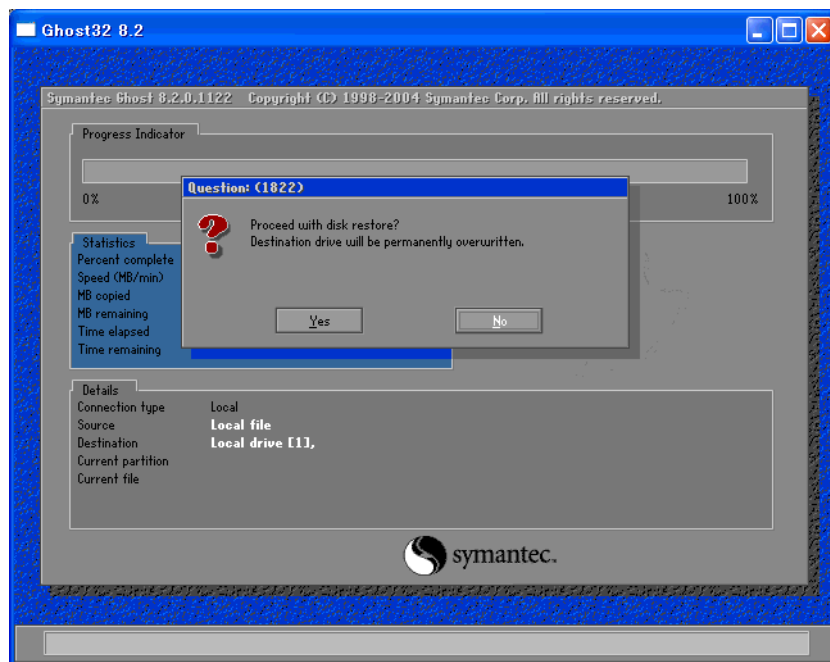(2)   On the [Boot] menu, move "USB CDROM" to the top of the screen using the [+] key or the [-] key.

(3)   Press the [F10] key and select [Yes] for [Save configuration changes and exit now?] to save the settings and restart the PS-A unit.

(4)   After the PS-A unit restarts, the Symantec Ghost™ will automatically start.

(5)   After the Symantec Ghost™ starts, the [Question] dialog box will appear.

"Partition sizes correct?"

(6)   The volume displayed in New Size will be recovered. After confirming it, press the [Yes] button. To change it, press the [No] button and go to the [Destination Drive Details] dialog box. In the [Destination Drive Details] dialog box, change the size of the New Size and press the [OK] button.

(7) The [Question] dialog box will appear. Press the [Yes] button. It will be reconfirmed that the data of the hard disk is all reset to the original values at the time of delivery.

"Proceed with disk restore? Destination drive will be permanently overwritten."

(8) The hard disk recovery program will start. After the recovery operation finishes, the Symantec Ghost™ also will finish. When the message "Please turn off computer" displayed, turn off the power of PS-A.

(9) Turn on the power of PS-A again and immediately press the [F2] key to enter the BIOS setup screen.

(10) Press the [F9] key and select [Yes] for [Load default configuration now?] to set the BIOS setting to the factory setting. Press the [F10] key to save the setting and restart the PS-A unit.

(11) After the unit restarts, set up your OS.

$\boxed{\text{SEE} \rightarrow}$ *1.3.1 Setting Up OS (page1-6)*

IMPORTANT

- If the hard disk unit breaks down due to a hardware problem, (Ex. if BIOS cannot find the hard disk, if the hard disk's lifetime expires, or it breaks down), Symantec Ghost™ cannot recover the hard disk. Pro-face recommends that in this case you contact your local PS-A distributor for instructions about hard disk recovery or replacement.

- Pro-face does not guarantee the preservation of any data stored on the HDD unit if the HDD unit has an accident, malfunctions or is damaged in any way. Therefore, the regular backing up of important HDD unit data to either floppy disks, or other type of suitable magnetic media is strongly recommended.

A | Appendices

1. I/O Map
2. Memory Map
3. Interrupt Map
4. License Agreement

This chapter describes the hardware configuration of the I/O map, memory map, and interrupt map.

1   I/O Map

Address	AT System Device	System Device
0000H-001FH	DMA controller (8237)	
0020H-003FH	Interrupt controller (8259A)	
0040H-005FH	System timer (8254)	
0060H-006FH	Keyboard controller	
0070H-007FH	Real time clock, NMI mask	
0080H-009FH	DMA page register	
00A0H-00BFH	Interrupt controller 2 (8259A)	
00C0H-00DFH	DMA controller 2 (8237)	
00F0H-00FFH	Numeric data processor	
01F0H-01FFH	Hard disk (IDE)	
0290H-0297H	Reserved	System monitor
02E8H-02EFH	Reserved	Serial port 4 (COM4)
02F8H-02FFH	Serial port 2 (COM2): General use	
03B0H-03BBH	Video controller (VGA)	
03C0H-03DFH	Video controller (VGA)	
03E8H-03EFH	Reserved	Serial port 3 (COM3)
03F8H-03FFH	Serial port 1 (COM1): General use	

NOTE   • The resources of the PCI BUS board that is installed by the user are automatically assigned to the free resource by the Plug and Play feature.

2   Memory Map

SMRAM	MAXMEM
FrameBuffer	MAXMEM-1MB
	MAXMEM-9MB[*1]
Expanded Memory	
System BIOS	1MB
Expanded ROM Area	F000:0000
PXE BIOS, VGA BIOS	D000:0000
Video RAM	C000:0000
Conventional Memory	A000:0000
	0000:0000

*1   The capacity allocated by "IGD-Memory Size" of the "Video (Intel IGD) Control Sub-Menu" screen of the BIOS setting is 1MB.

3   Interrupt Map

NOTE   • The interrupts and DMA channel will change depending on the PnP features of PCI available.

■ Hardware Interrupt List

		Description
NMI		Parity Error or I/O Channel Check
IRQ	0	Timer (in the Chipset)
	1	Keyboard
	2	Cascade from Controller 2
	3	Serial Port 2 (COM2): General Use Port
	4	Serial Port 1 (COM1): General Use Port
	5	Available for users *
	6	Available for users *
	7	Available for users *
	8	Real Time Clock
	9	Available for users *
	10	Available for users *
	11	Available for users *
	12	Available for users *
	13	Numeric Data Processor
	14	Hard Disk (IDE)
	15	Hard Disk (IDE)
	16	USB Controller, Display Controller
	17	Multimedia Device, Cardbus Controller
	18	USB Controller
	19	USB Controller, Network Controller
	20	Network Controller
	21	Reserved
	22	Reserved
	23	USB 2.0 Controller

IMPORTANT   • The "*" mark indicates that, depending on the customer's settings, the following

devices are automatically allocated as Plug and Play devices.
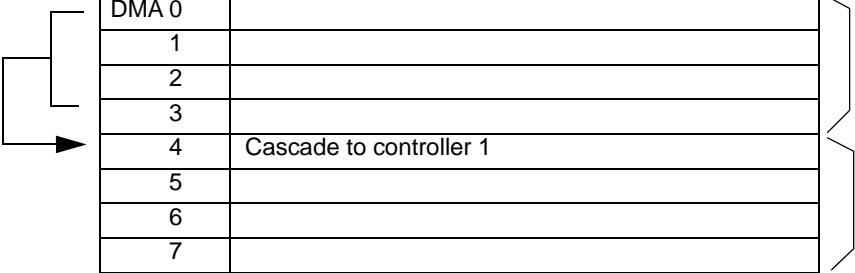
Display Controller

SMBus Controller

Multimedia Device

Network Controller

USB Controller

■ DMA Channel List

	Description
DMA 0	
1	
2	
3	
4	Cascade to controller 1
5	
6	
7	

For 8-bit transmission

For 8-bit transmission

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    License Agreement

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