# PS-4000B Series

## User Manual

5/2011

## Important Notice

UL/cUL - UL508 and UL HazLoc ISA12.12.01 certifications are pending.

Therefore the products are not UL certified.

As soon as UL certification will be granted, products will be marked accordingly.

Please see labels on product to check certification.

Industrial automation
**Elincom Group**
European Union: www.elinco.eu
Russia: www.elinc.ru

**Pro-face**®

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Pro-face nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.
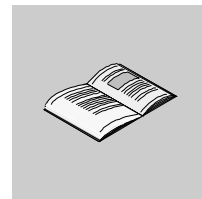
When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Pro-face software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

# Table of Contents

# Safety Information

## Important Information

**NOTICE**

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

## ⚠ DANGER

**DANGER** indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

## ⚠ WARNING

**WARNING** indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

## ⚠ CAUTION

**CAUTION** indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

## CAUTION

**CAUTION**, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** equipment damage.

**PLEASE NOTE**

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Pro-face for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

# About the Book
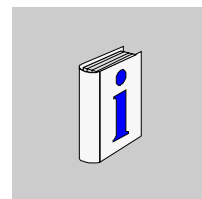
## At a Glance

Thank you for purchasing Pro-face's PS-4000B Series (Hereafter referred to as the "PS-B unit").

### Document Scope

|  | PFXP | B | 1 | B | 2 | B | D | 2 | 3 | C | 1 | 1 | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reference | 1-4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

| Reference | Character Description | Possible Values |
|---|---|---|
| 1-4 | Part Number | PFXP |
| 5 | Base Unit | B: BOX-IPC (PS-B unit) |
| 6 | Reserved | - |
| 7 | Display | B: None (BOX-IPC) (PS-B unit) |
| 8 | Expansion slots | 1: 1 slot = 1 PCI<br>2: 2 slots = 1 PCI+1 PCIe<br>5: 5 slots = 2 PCI+3 PCIe |
| 9 | CPU type | B: Atom N270<br>C: Core 2 Duo P8400 |
| 10 | Power Supply | D: DC<br>F: DC with Noise filter for Marine Certification<br>G: DC with Battery Backup and Noise filter for Marine Certification (in development) |
| 11 | RAM<br>(Configuration available depend on model) | 1: 1 GB (Atom N270/Core 2 Duo P8400)<br>2: 2 GB (Atom N270/Core 2 Duo P8400)<br>3: 3 GB (Atom N270)<br>4: 4 GB (Core 2 Duo P8400) |
| 12 | Operating System | 0: None<br>1: Windows Embedded Standard 2009 (32-bit, English MUI)<br>2: Windows XP Professional (32-bit, Japanese)<br>3: Windows XP Professional (32-bit, English MUI)<br>4: Windows Embedded Standard 7 (32-bit, English MUI)<br>5: Windows 7 Ultimate (32-bit, English MUI) |
| 13 | Main Storage device sizes (where to install the OS) | N: None<br>C: Compact Flash Card 4 GB<br>D: Compact Flash Card 8 GB<br>K: HDD 250 GB<br>T: SSD 32 GB |

| Reference | Character Description | Possible Values |
|---|---|---|
| 14 | Slide in equipment | 0: None<br>1: DVD Multi drive<br>2: HDD with Slide-in Slot Adapter<br>3: SSD with Slide-in Slot Adapter<br>4: DVD Multi drive + HDD with Slide-in Slot Adapter<br>5: DVD Multi drive + SSD with Slide-in Slot Adapter |
| 15 | Options | 0: None<br>2: DVI-D I/F Expansion Board Slot<br>4: COM I/F Expansion Board Slot<br>5: DVI-D I/F Expansion Board Slot and COM I/F Expansion Board Slot |
| 16 | Software bundle | N: None<br>G: Win GP |
| 17, 18 | Reserved | - |

**NOTE:** All instructions applicable to the enclosed product and all safety precautions must be observed.

**Validity Note**

This documentation is valid for PS-4000B.

The technical characteristics of the device(s) described in this manual appear online. To access this information online, please go to our site http://www.pro-face.com/otasuke/

The characteristics presented in this manual should be constantly improved for clarity and accuracy. In the event that you see a difference between the manual in your PC and online information, use the online information as your reference.

### Registered Trademarks

The company names and product names used in this manual are the trade names, trademarks (including registered trademarks), and service marks of their respective companies. This product omits individual descriptions of each of these rights.

| Trademark / Tradename | Right Holder |
|---|---|
| Microsoft, Windows | Microsoft, U.S. |
| Pro-face | Digital Electronics Corporation (in Japan and other countries) |
| Intel | Intel Corporation |
| Adobe | Adobe Systems Incorporated |

The following terms differ from the abovementioned trade names and trademarks.

| Term used in this manual | Formal Trademark or Tradename |
|---|---|
| Windows Embedded Standard 2009 | Microsoft® Windows® Embedded Standard Runtime |
| Windows Embedded Standard 7 | Windows® Embedded Standard 7 Runtime (WS7P)(ESD) |
| Windows XP Professional | Microsoft® Windows® XP Professional for Embedded Systems (1-2 CPU) ESD |
| Windows 7 | Windows® 7 Ultimate for Embedded Systems x32 (1-2 CPU) (ESD) |
| Adobe Reader | Adobe® Reader® |
| Atom N270 | Intel® Atom$^{TM}$ N270 |
| Core 2 Duo | Intel® Core$^{TM}$ 2 Duo P8400 |

### Related Documents

| Title of Documentation |
|---|
| PS-4000B Series User Manual (this manual) |

You can download these technical publications and other technical information from our website "Otasuke Pro!" at http://www.pro-face.com/otasuke/.

**Product Related Information**

PS-B units are certified for use in Class I, Division 2 hazardous locations as defined in UL 1604, ANSI/ISA 12.12.01 or CSA C22.2 N°213. Observe the following:

---

# ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the PS-B unit and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the PS-B unit.

**Failure to follow these instructions will result in death or serious injury.**

---

# ⚠ WARNING

**LOSS OF CONTROL**

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.(1)
- Each implementation of a PS-B unit must be individually and thoroughly tested for proper operation before being placed into service.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

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(1) For additional information, refer to *NEMA ICS 1.1 (latest edition)*, *"Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition),"Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems" or other applicable standards in your location.*

**NOTE:** PS-B is a highly configurable device and is not based on a real-time operating system. Changes to the software and settings of the following must be considered new implementations as discussed in the previous warning messages. Examples of such changes include:

- System BIOS
- System Monitor
- Operating system
- Installed hardware
- Installed software

# ⚠ WARNING

**UNINTENDED EQUIPMENT OPERATION**

Use only the software provided with this product.  If you use the other software, please confirm the operation and safety before you use.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

# General Overview

**I**
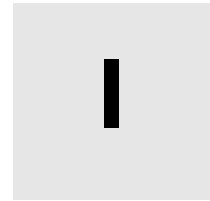
**Subject of this Part**

This part provides an overview of PS-B unit.

**What's in this Part?**

This part contains the following chapters:

| Chapter | Chapter Name | Page |
|:---:|---|:---:|
| 1 | Important Information | 15 |
| 2 | Physical Overview | 25 |
| 3 | Characteristics | 41 |
| 4 | Dimensions/Assembly | 47 |

# Important Information

**1**

**General**

This chapter describes the safety aspects which are specific to the operation of the PS-B unit.

**What's in this Chapter?**

This chapter contains the following topics:

| Topic | Page |
|---|---|
| Federal Communications Commission Radio Frequency Interference Statement - For U.S.A. | 16 |
| Qualified Personnel | 17 |
| Certifications and Standards | 18 |
| European (CE) Compliance | 19 |
| Hazardous Location Installations - For USA and Canada | 20 |

# Federal Communications Commission Radio Frequency Interference Statement - For U.S.A.

**FCC Radio Interference Information**

This equipment has been tested and found to comply with the Federal Communications Commission (FCC) limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause or be subject to interference with radio communications. To minimize the possibility of electromagnetic interference in your application, observe the following two rules:

- Install and operate the PS-B unit in such a manner that it does not radiate sufficient electromagnetic energy to cause interference in nearby devices.
- Install and test the PS-B unit to ensure that the electromagnetic energy generated by nearby devices does not interfere with the PS-B unit's operation.

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### ⚠ **WARNING**

**ELECTROMAGNETIC / RADIO INTERFERENCE**

Electromagnetic radiation may disrupt the PS-B unit's operations, leading to unintended equipment operation. If electromagnetic interference is detected:

- Increase the distance between the PS-B unit and the interfering equipment.
- Reorient the PS-B unit and the interfering equipment.
- Reroute power and communication lines to the PS-B unit and the interfering equipment.
- Connect the PS-B unit and the interfering equipment to different power supplies.
- Always use shielded cables when connecting the PS-B unit to a peripheral device or another computer.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

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## Qualified Personnel

**General**

Only qualified personnel can install, operate, and maintain the product. A qualified person is one who has skills and knowledge related to the construction, operation, and installation of electrical equipment, and has received safety training to recognize and avoid the hazards involved. Refer to the most current release of NFPA 70E®, Standard for Electrical Safety in the Workplace, for electrical safety training requirements or other applicable standards in your location. Examples of qualified personnel may include:

- at the application design level, engineering department personnel who are familiar with automation safety concepts (for example, a design engineer)
- at the equipment implementation level, personnel who are familiar with the installation, connection and commissioning of automation equipment (for example, an installation assembly or cabling engineer or a commissioning technician)
- at the operation level, personnel who are experienced in the use and control of automation and computing equipment (for example, an operator)
- for preventive or corrective maintenance, personnel trained and qualified in regulating or repairing automated and computing devices (for example, an operating technician or after-sales service technician.)

# Certifications and Standards

**Agency Certifications**

Pro-face submitted this product for independent testing and qualification by third-party agencies. These agencies have certified this product as meeting the following standards.

- GOST certified.  Please refer to product markings.
- ATEX  (directive 94/9/EC) certified.  Please refer to product markings.
- Germanischer Lloyde Type approval.

Pro-face is in the process of certifying compliance with the following standards.

- UL/c-UL certified.  UL 508 and CSA C22.2 N°142, Industrial Control Equipment
- UL/c-UL certified.  UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213, Electrical Equipment for Use in Class I, Division 2 Hazardous (Classified) Locations

**Compliance Standards**

Pro-face tested this product for compliance with the following compulsory standards.

United States:

- Federal Communications Commission, FCC Part 15

Europe: CE

- Directive 2006/95/EC (Low Voltage)
  Directive 2004/108/EC (EMC)
- Programmable Controllers: EN 61131-2 (Ed 3)
- EMI: EN55011 (Group 1, Class A), EN 61000-6-4
- EMS: EN 61000-6-2

Australia:

- Standard AS/NZS CISPR11 (C-Tick)

**Qualification Standards**

Pro-face voluntarily tested this product to additional standards. The additional tests performed, and the standards under which the tests were conducted, are specifically identified in Environmental Characteristics *(see page 46)*.

**Hazardous Substances**

This product is compliant with:

- WEEE, Directive 2002/96/EC
- RoHS, Directive 2002/95/EC
- RoHS China, Standard SJ/T 11363-2006

**End of Life (WEEE)**

The product contains electronic boards. It must be disposed of in specific treatment channels. The product contains cells and/or storage batteries which must be collected and processed separately, when they have run out and on product end of life.

See the Regular Cleaning and Maintenance *(see page 107)* to extract easily and safely extract cells and batteries from the product. These batteries do not contain a weight percentage of heavy metals over the threshold notified by European Directive 2006/66/EC.

## European (CE) Compliance

**CE Compliance Note**

The products described in this manual comply with the European Directives concerning Electromagnetic Compatibility and Low Voltage (CE marking) when used as specified in the relevant documentation, in applications for which they are specifically intended, and in connection with approved third-party products.

# Hazardous Location Installations - For USA and Canada

**General**

The PS-B unit has been designed with the intention of meeting the requirements of Class I, Division 2 hazardous location applications. Division 2 locations are those locations where ignitable concentrations of flammable substances are normally confined, prevented by ventilation, or present in an adjacent Class I, Division 1 location, but where an abnormal situation might result in intermittent exposure to such ignitable concentrations.

While the PS-B unit is a non-incendiary device under UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213, it is not designed for, and should never be used within a Division 1 (normally hazardous) location.

PS-B units are suitable for use in Class I, Division 2, Groups A, B, C, and D hazardous locations or in non-hazardous locations. Before installing or using your PS-B unit, confirm that the UL 1604, ANSI/ISA 12.12.01 or CSA C22.2 N°213 certification appears on the product labeling

**NOTE:** Some PS-B units are not yet rated as suitable for use in hazardous locations. Always use your product in conformance with the product labeling and this manual.

---

### ⚠ **DANGER**

**EXPLOSION HAZARD**

- Do not use your PS-B unit in hazardous environments or locations other than Class I, Division 2, Groups A, B, C, and D.
- Always confirm that your PS-B unit is suitable for use in hazardous locations by checking that the UL 1604, ANSI/ISA 12.12.01 or CSA C22.2 N°213 certification appears on the product labeling.
- Do not install any Pro-face or OEM components, equipment, or accessories unless these have also been qualified as suitable for use in Class I, Division 2, Groups A, B, C, and D locations.
- In addition, confirm that any PCI/PCIe controller cards have a temperature code (T-code), and are suitable for an ambient temperature range of +0°C to +50°C (32°F to 122°F).
- Do not attempt to install, operate, modify, maintain, service, or otherwise alter the PS-B unit except as permitted in this manual. Unpermitted actions may impair the unit's suitability for Class I, Division 2 operation.

**Failure to follow these instructions will result in death or serious injury.**

---

# ⚠ DANGER

**EXPLOSION HAZARD**

- Always confirm the UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a PS-B unit installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect any cables or wires while the circuit is live unless the area is known to be free of ignitable concentrations of vapors, gases, and other flammable or combustible materials. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incendiary USB configuration *(see page 79)*.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

**Failure to follow these instructions will result in death or serious injury.**

# ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the PS-B unit and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the PS-B unit.

**Failure to follow these instructions will result in death or serious injury.**

Ensure that the product is properly rated for the location. If the intended location does not presently have a Class, Division and Group rating, then users should consult the appropriate authorities having jurisdiction in order to determine the correct rating for that hazardous location.

In accordance with Federal, State/Provincial, and Local regulations, all hazardous location installations should be inspected prior to use by the appropriate authority having jurisdiction. Only technically qualified personnel should install, service, and inspect these systems.

**Power Switch**

# ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the PS-B unit and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the PS-B unit.

**Failure to follow these instructions will result in death or serious injury.**

The amount of input power required by systems with a PS-B unit classifies the power switch as an incendiary device because the voltage and current across the make/break component are capable of generating a spark.

If using an ordinary power switch, hazardous location regulations require the power switch be  located in an area specified as non-hazardous.

However, limits in cable length between the workstation and the power switch may apply. Otherwise the switch must be compliant with Class I, Division 1 requirements (intrinsically safe). These switches are built in a manner that prevents the possibility of a spark when contact is made or broken.

Use suitable UL listed and/or CSA Certified Class I, Division 1 switches in hazardous locations. These switches are available from a wide number of sources. It is the responsibility to ensure you select a power switch that conforms to the hazardous location rating for the installation.

**Cable Connections**

# ⚠ DANGER

**EXPLOSION HAZARD**

- Always confirm the UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a PS-B unit installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect any cables or wires while the circuit is live unless the area is known to be free of ignitable concentrations of vapors, gases, and other flammable or combustible materials. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incendiary USB configuration *(see page 79)*.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

**Failure to follow these instructions will result in death or serious injury.**

Division 2 hazardous location regulations require that all cable connections be provided with adequate strain relief and positive interlock. Use only non-incendiary USB devices as USB connections do not provide adequate strain relief to allow the use of Front USB outlet on the PS-B unit *(see page 70)*. Never connect or disconnect a cable while power is applied at either end of the cable. All communication cables should include a chassis ground shield. This shield should include both copper braid and aluminum foil. The D-sub style connector housing must be a metal conductive type (e.g., molded zinc) and the ground shield braid must be terminated directly to the connector housing. Do not use a shield drain wire.

The outer diameter of the cable must be suited to the inner diameter of the cable connector strain relief so that a reliable degree of strain relief is maintained. Always secure the D-Sub connectors to the workstation-mating connectors via the two screws located on both sides.

### Operation and Maintenance

The systems have been designed for compliance with relevant spark ignition tests.

> # ⚠ DANGER
>
> **EXPLOSION HAZARD**
>
> In addition to the other instructions in this manual, observe the following rules when installing the PS-B unit in a hazardous location:
>
> ● Wire the equipment in accordance with the National Electrical Code article 501.10(B) for Class I, Division 2 hazardous locations.
>
> **Failure to follow these instructions will result in death or serious injury.**

### Hazardous Location Installations - For ATEX

PS-4000B Series must only be mounted in to the category 3D enclosures according

to the directive 94/9/EC.

The assembled units with an enclosure should be marked:

II 3D Ex tc IIIA T85°C Dc Tamb: 0°C to +50°C

### Marine Installations - For GL

Noise Filter must be used in DC power line.

# Physical Overview

**2**

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**Subject of this Chapter**

This chapter provides a physical overview of the product.

**What's in this Chapter?**
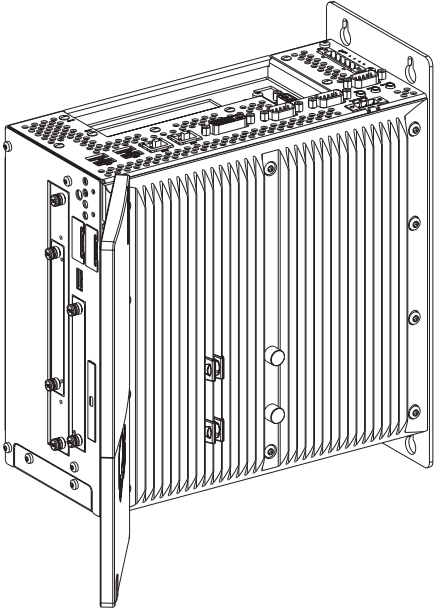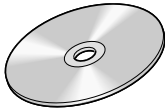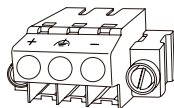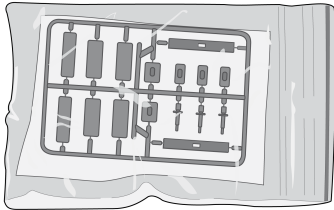
This chapter contains the following topics:

# Package Contents

**Items**

The following items are included in the PS-B unit package. Before using the PS-B unit, please confirm that all items listed here are present.

| | |
|---|---|
| PS-B unit: 1 | |
| DVD-ROM containing the software required to reinstall the Operating System. | |
| DC Connector | |
| Documents | ● Warning/Caution Information (1)<br>● The MS Windows EULA<br>● PS4000 Series Installation Guide (1) |
| Connector cover (1) | |

This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local PS-B distributor immediately.

## PS-B Unit Description

<div style="border:1px solid">

# ⚠ **WARNING**

**RISK OF BURNING INJURY**

During operation, surface temperatures of the heat sink may reach 70°C (158°F).

Do not touch the surface of the heat sink during operation.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

</div>

### PS-B unit 1 slot Unit Description

### Interfaces top View
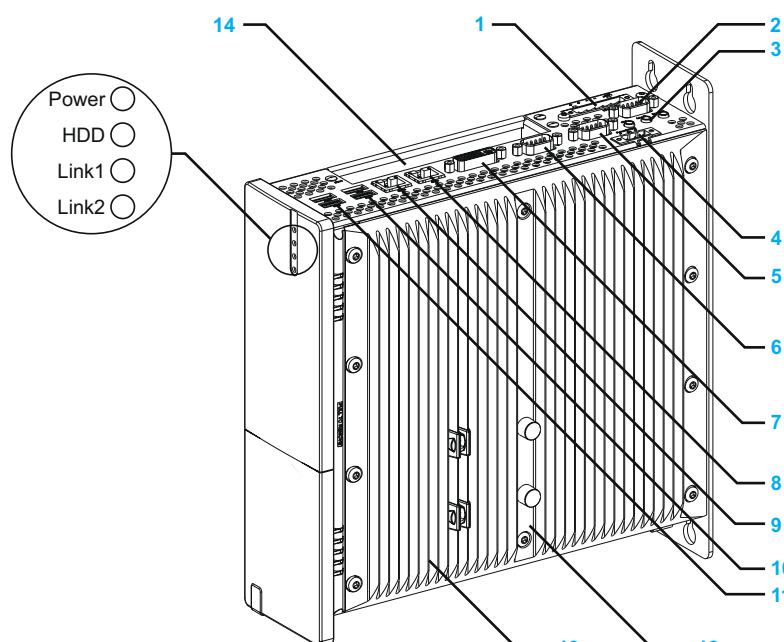


**1** Add-on UPS slot (in development)
**2** Add-on interface slot
**3** MIC, Line IN, Line OUT
**4** Supply voltage +24 Vdc
**5** COM2
**6** COM1
**7** Monitor/Panel, BDL(Box Display Link)/DVI-I
**8** ETH1 (10/100/1000 MBit)
**9** ETH2 (10/100/1000 MBit)
**10** USB2, USB4 (max 500mA)
**11** USB1, USB3 (max 1A)
**12** Warning sign/Heat sink seal
**13** Heat sink
**14** PCI slot (half-size)/PCI or PCIe

**Interface Front View**



**1** Status LEDs

| LED | Color | | Meaning |
|---|---|---|---|
| Power | Green | On | Supply voltage OK |
| | Red | On | The system is in standby mode (S5: soft-off mode or S4: hibernate mode -Suspend-to-Disk) |
| | Orange[1] | On | Supply voltage not OK; the system is operating on battery power. |
| HDD | Yellow | On | Signals IDE drive access (CF, HDD, CD, etc.) |

1) Only lit when add-on UPS module (in development) is installed.

**2** Permanent magnet
**3** Fan kit cover
**4** Serial number sticker
**5** Compact Flash slot CF1/Connection via IDE-PATA
**6** Slide-in Disk slot
**7** USB5 (max. 1A)
**8** Battery
**9** Power/Reset button
**10** CMOS Profile switch (page.86)

## PS-B Unit 2 slot Unit Description
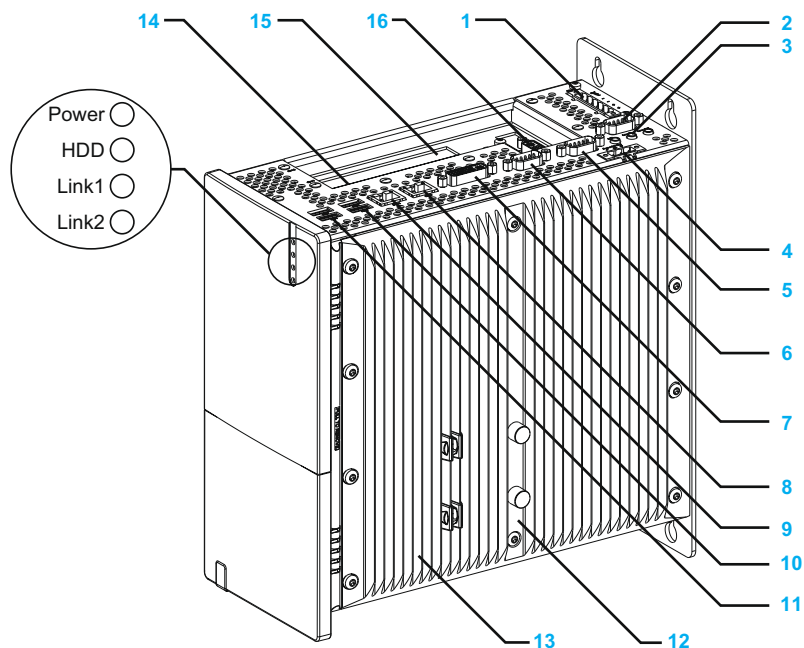
### Interface Top View



**1** Add-on UPS slot (in development)
**2** Add-on interface slot
**3** MIC, Line IN, Line OUT
**4** Supply voltage +24 Vdc
**5** COM2
**6** COM1
**7** Monitor/Panel, BDL (Box Display Link)/DVI-I
**8** ETH1 (10/100/1000 MBit)
**9** ETH2 (10/100/1000 MBit)
**10** USB2, USB4 (max.500 mA)
**11** USB1, USB3 (max.1A)
**12** Warning sign/Heat sink seal
**13** Heat sink
**14** PCI slot 1 (half-size)/PCI or PCIe
**15** PCI slot 2 (half-size)/PCI or PCIe
**16** DVI-D I/F Expansion Board Slot

**Interface Front View**



**1** Status LEDs

| LED | Color | | Meaning |
|-----|-------|-----|---------|
| Power | Green | On | Supply voltage OK |
| | Red | On | The system is in standby mode (S5: soft-off mode or S4: hibernate mode -Suspend-to-Disk) |
| | Orange[1] | On | Supply voltage not OK; the system is operating on battery power. |
| HDD | Yellow | On | Signals IDE drive access (CF, HDD, CD, etc.) |

1) Only lit when add-on UPS module (in development) is installed.

**2** Permanent magnet
**3** Fan kit cover
**4** Serial number sticker
**5** Compact Flash slot CF1/Connection via IDE-PATA
**6** Slide-in Disk slot (Connection via SATA)
**7** USB5 (max. 1 A)
**8** Battery
**9** Slide-in slot 1 ( connection via SATA)
**10** Power/Reset button
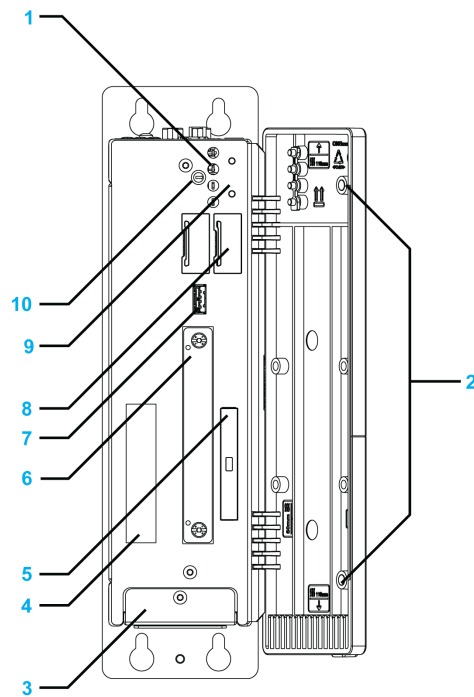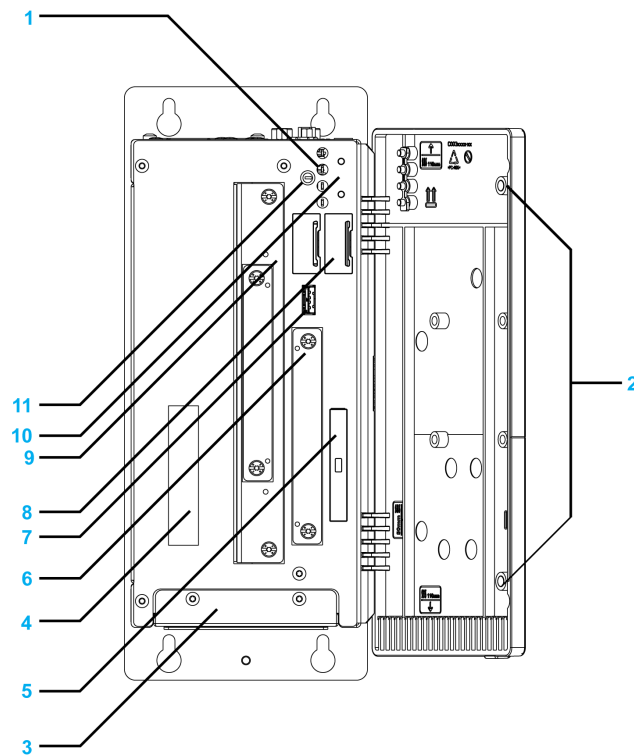**11** CMOS Profile switch (page.86)

## PS-B Unit 5 slot Unit Description
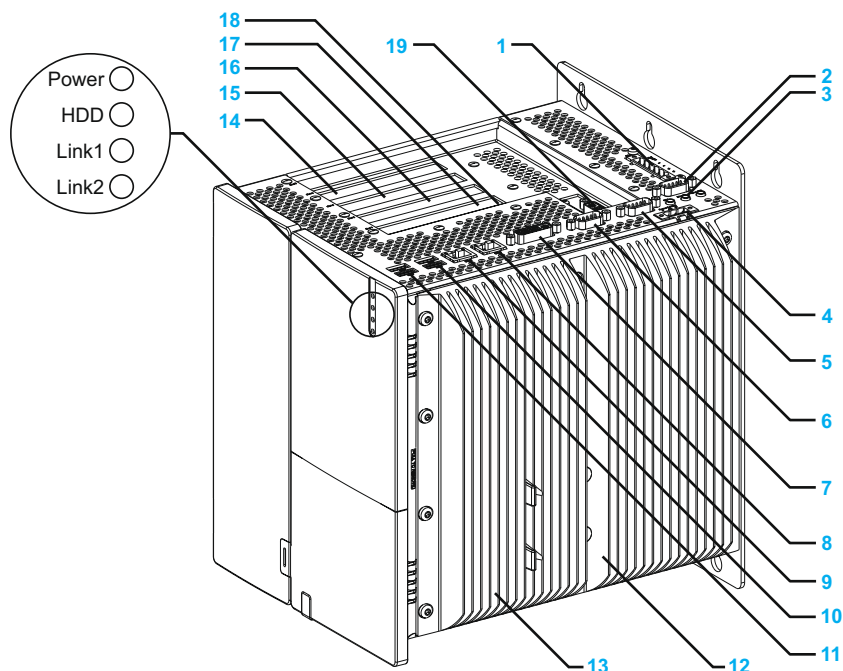
### Interface Top View



**1** Add-on UPS slot (in development)
**2** Add-on interface slot
**3** MIC, Line IN, Line OUT
**4** Supply voltage +24 Vdc
**5** COM 2
**6** COM 1
**7** Monitor/panel/BDL (Box Display Link)/DVI-I
**8** ETH1 (10/100/1000 MBit)
**9** ETH2 (10/100/1000 MBit)
**10** USB2, USB4 (max. 500 mA)
**11** USB1, USB3 (max. 1 A)
**12** Warning sign/Heat sink seal
**13** Heat sink
**14** PCI slot 5 - half-size/PCI or PCIe
**15** PCI slot 4 -  half-size/PCI or PCIe
**16** PCI slot 3 - half-size/PCI or PCIe
**17** PCI slot 2 - half-size/PCI or PCIe
**18** PCI slot 1 - half-size/PCI or PCIe
**19** DVI-D I/F Expansion Board Slot

**Interface Front View**
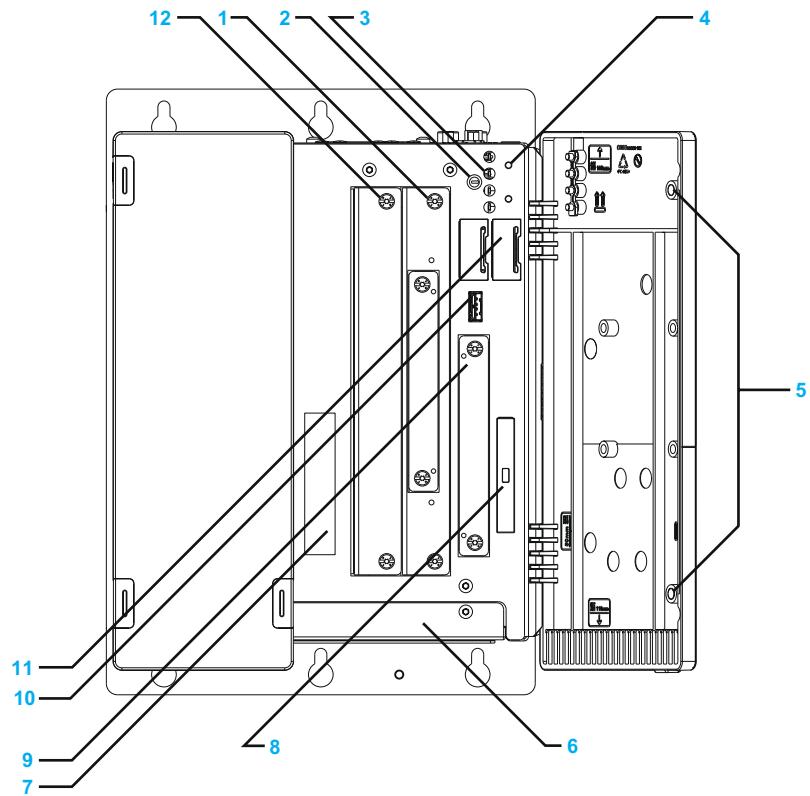


**1**   Slide-in slot 1 (Connection via SATA)
**2**   CMOS profile switch
**3**   Status LEDs

| LED | Color | | Meaning |
|---|---|---|---|
| Power | Green | On | Supply voltage OK |
| | Red | On | The system is in standby mode (S5: soft-off mode or S4: hibernate mode -Suspend-to-Disk) |
| | Orange[1] | On | Supply voltage not OK; the system is operating on battery power. |
| HDD | Yellow | On | Signals IDE drive access (CF, HDD, CD, etc.) |

1) Only lit when add-on UPS module (in development) is installed.

**4**   Power/Reset button
**5**   Permanent magnet
**6**   Fan kit cover
**7**   Serial number sticker
**8**   Compact Flash slot CF1/Connection via IDE - PATA
**9**   Slide-in compact slot (Connection via SATA)
**10**  USB5 (max. 1 A)
**11**  Battery
**12**  Slide-in slot 2 (Connection via SATA)

## Interface Specifications

### Communication Connections

---

# ⚠ DANGER

**EXPLOSION HAZARD**

- Always confirm the UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a PS-B unit installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect any cables or wires while the circuit is live unless the area is known to be free of ignitable concentrations of vapors, gases, and other flammable or combustible materials. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incendiary USB configuration *(see page 79)*.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

**Failure to follow these instructions will result in death or serious injury.**

---

# ⚠ WARNING

**EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION**

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration environment when making this determination.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only commercially available USB cables.
- Use the Single-link Monitor to connect DVI-D I/F Expansion Board Slot.  If you use the Dual-link Monitor, the monitor is unable to show and it will cause malfunction to the monitor.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

---

### Serial Interfaces

**COM 1 and COM 2**: These interfaces are used to connect an RS-232C (serial) cable with a D-SUB 9 pin connector.

| Serial interface COM1 and COM2 | | |
|---|---|---|
| Type | RS-232C, modem-capable, not electrically isolated | |
| UART | 16650-compatible, 16-byte FIFO | |
| Transfer rate | Max. 115 kBit/s | |
| Cable length | Max. 15 meters (49.21 feet) | |
| Interfit Bracket | #4-40 (UNC) | |
| **Pin** | **Assignment** | |
| 1 | DCD | |
| 2 | RXD | |
| 3 | TXD | |
| 4 | DTR | |
| 5 | GND | |
| 6 | DSR | |
| 7 | RTS | |
| 8 | CTS | |
| 9 | RI | |

### Add-on Serial Interfaces

**COM I/F Expansion Board Slot Pin Assignments**: The serial interface is a combined RS-232C/RS-422/RS-485 interface with D-SUB 9 pin connector. The operating mode (RS-232C/RS-422/RS-485) is selected automatically, depending on the electrical connection.

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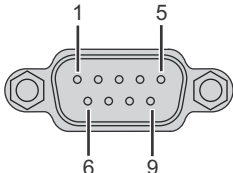
### ⚠ CAUTION

**UNINTENDED PIN WIRING**

● Do not connect anything to n.c. pins.

**Failure to follow these instructions can result in unintended communication.**

---

**Add-on Serial interface COM I/F Expansion Board Slot Pin Assignments**

| | RS-232C | RS-422/485 | |
|---|---|---|---|
| Type | RS-232C not modem compatible; Electrically isolated | | |
| UART | 16550 compatible, 16 byte FIFO | | |
| Transfer rate | Max. 115 kBit/s | | |
| Cable length | Max. 15 meters (49.21 feet) | Max. 1200 meters (3937.01 feet) | |
| **Pin** | **Assignments (RS-232C)** | **Assignments (RS-422)** | |
| 1 | n.c. | TXD\ | |
| 2 | RXD | n.c. | |
| 3 | TXD | n.c. | |
| 4 | n.c. | TXD | |
| 5 | GND | GND | |
| 6 | n.c. | RXD\ | |
| 7 | RTS | n.c. | |
| 8 | CTS | n.c. | |
| 9 | n.c. | RXD | |

**Bus length and cable type RS-232C**

The maximum transfer rate of 115 kBit/s depends on the cable type being used.

| Distance [m] | Transfer rate [kBit/s] |
|---|---|
| ≤ 15 | Typ. 64 |
| ≤ 10 | Typ. 115 |
| ≤ 5 | Typ. 115 |

The material used for the cable should preferably have all or most of the following properties in order to reach an optimal transfer rate.

| RS-232C cable | Property |
|---|---|
| Signal lines<br>    Cable cross section<br>    Wire insulation<br>    Conductor resistance<br>    Stranding<br>    Shield | <br>4 x 0.16 mm² (26AWG), tinned Cu wire<br>PE<br>≤ 82  Ω/km<br>Wires stranded in pairs<br>Paired shield with aluminum foil |
| Grounding line<br>    Cable cross section<br>    Wire insulation<br>    Conductor resistance | <br>1 x 0.34 mm² (22AWG/19), tinned Cu wire<br>PE<br>≤ 59  Ω/km |
| Outer sheathing<br>    Material<br>    Characteristics<br>    Entire shielding | <br>PUR mixture<br>Halogen free<br>From tinned cu wires |

### RS-422 - Bus length and cable type

The RTS line must be switched on to activate the sender.

The maximum transfer rate of 115 kBit/s depends on the cable type being used.

| Distance [m] | Transfer rate [kBit/s] |
|---|---|
| 1200 | Typ. 115 |

The material used for the cable should preferably have all or most of the following properties in order to reach an optimal transfer rate.

| RS-422 cable | Property |
|---|---|
| Signal lines<br>    Cable cross section<br>    Wire insulation<br>    Conductor resistance<br>    Stranding<br>    Shield | <br>4 x 0.25 mm² (24AWG/19), tinned Cu wire<br>PE<br>$\leq 82$ $\Omega$/km<br>Wires stranded in pairs<br>Paired shield with aluminum foil |
| Grounding line<br>    Cable cross section<br>    Wire insulation<br>    Conductor resistance | <br>1 x 0.34 mm² (22AWG/19), tinned Cu wire<br>PE<br>$\leq 59$ $\Omega$/km |
| Outer sheathing<br>    Material<br>    Characteristics<br>    Entire shielding | <br>PUR mixture<br>Halogen free<br>From tinned cu wires |

### RS-485 interface operation

The pins of the RS-422 default interface (1, 4, 6 and 9) should be used for operation. The pins should be connected as shown.
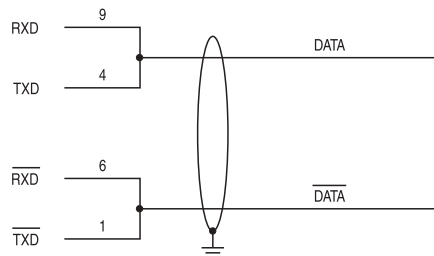


The RTS line must be switched each time the driver is sent and received; there is no automatic switch back. This cannot be configured in Windows.

The voltage drop caused by long line lengths can lead to greater potential differences between the bus stations, which can hinder communication. This can be improved by running ground wire with the others.

The line ends of the RS-485 interface should (at least for longer line lengths or larger transfer rates) be closed. Normally a passive terminator can be used on the bus ends by connecting each of the signal lines with 120 $\Omega$ resistance.

### RS-485 - Bus length and cable type

The maximum transfer rate of 115 kBit/s depends on the cable type being used.

| Distance [m] | Transfer rate [kBit/s] |
|---|---|
| 1200 | Typ. 115 |

The material used for the cable should preferably have all or most of the following properties in order to reach an optimal transfer rate.

| RS-485 cable | Property |
|---|---|
| Signal lines<br>    Cable cross section<br>    Wire insulation<br>    Conductor resistance<br>    Stranding<br>    Shield | <br>4 x 0.25 mm² (24AWG/19), tinned Cu wire<br>PE<br>$\leq 82$  $\Omega$/km<br>Wires stranded in pairs<br>Paired shield with aluminum foil |
| Grounding line<br>    Cable cross section<br>    Wire insulation<br>    Conductor resistance | <br>1 x 0.34 mm² (22AWG/19), tinned Cu wire<br>PE<br>$\leq 59$  $\Omega$/km |
| Outer sheathing<br>    Material<br>    Characteristics<br>    Entire shielding | <br>PUR mixture<br>Halogen free<br>From tinned cu wires |
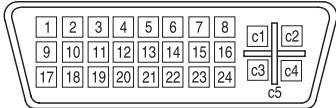
**DVI-D I/F Expansion Board Slot**

> ## ⚠ **WARNING**
>
> **EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION**
>
> - Use the Single-link Monitor to connect DVI-D I/F Expansion Board Slot.  If you use the Dual-link Monitor, the monitor is unable to show and it will cause malfunction to the monitor.
>
> **Failure to follow these instructions can result in equipment damage.**

| DVI-D I/F Expansion Board Slot | | | |
|---|---|---|---|
| Type | DVI-I 24 pin, Socket | | |
| Recommended Screw Type | No.4(40 UNC) | | |
| Cable length | Max. 5 meters (16.40 feet) | | |
| **Pin** | **Assignment** | **Pin** | **Assignment** |
| 1 | T.M.D.S. data 2- | 16 | Hot Plug detect |
| 2 | T.M.D.S. data 2- | 17 | T.M.D.S. data 0- |
| 3 | T.M.D.S. data 2/SDL shield | 18 | T.M.D.S. data 0+ |
| 4 | SDL- | 19 | T.M.D.S. DATA 0/XUSB1 shield |
| 5 | SDL+ | 20 | XUSB1- |
| 6 | DDC clock | 21 | XUSB1+ |
| 7 | DDC data | 22 | T.M.D.S. shield |
| 8 | n.c. | 23 | T.M.D.S. clock + |
| 9 | T.M.D.S. data 1- | 24 | T.M.D.S. clock - |
| 10 | T.M.D.S. Data 1+ | c1 | n.c. |
| 11 | T.M.D.S. DATA 1/XUBS0 shield | c2 | n.c. |
| 12 | XUSB0- | c3 | n.c. |
| 13 | XUSB0+ | c4 | n.c. |
| 14 | + 5V power[1] | c5 | n.c. |
| 15 | Ground (return for + 5 V, HSync and VSync) | | |

1) Protected internally by a multifuse

# Characteristics

# 3

**Subject of this Chapter**

This chapter lists the product characteristics.

**What's in this Chapter?**

This chapter contains the following topics:

| Topic | Page |
|---|---|
| Characteristics of the PS-B unit | 42 |
| Environmental Characteristics | 46 |

## Characteristics of PS-B unit

### Product Characteristics

The characteristics of the PS-B units are given below:

| Element | Characteristics | | | | |
|---|---|---|---|---|---|
| | AtomN270 1 slot | AtomN270 2 slots | Core2Duo P8400 1 slot | Core2Duo P8400 2 slots | Core2Duo P8400 5 slots |
| Expansion slots | 1 = 1PCI | 2 = 1 PCI + 1 PCIe | 1 = 1 PCI | 2 = 1 PCI + 1 PCIe | 5 = 2 PCI + 3 PCIe |
| Processor | AtomN270 1.6 GHz 512 KB L2 cache | | Core2Duo P8400 2.26 GHz 3 MB L2 cache | | |
| Chipset | 945GME | | GM45 | | |
| Cooling method | Passive heat sink, Fanless operation | | Fan kit with filter Fan speed is controlled by internal temperature. Fan does not operate unless internal temperature reaches the set temperature. | | |
| RAM | DDR2 533 MHz SO-DIMM 2 slots 1 GB to 3 GB max (Unable to be added by Users.) | | DDR3 1066 MHz SO-DIMM 2 slots 2 GB to 8 GB max (Unable to be added by Users.) | | |
| | | | | | |
| Graphics | | | | | |
| Controller | Intel® Graphics Media Accelerator 950 | | Intel® Graphics Media Accelerator (GMA) 4500 MHD | | |
| Memory | Up to 224 MB (reserved from main memory) | | Up to 384 MB (reserved from main memory) | | |
| Color depth | 32 bit (maximum) | | | | |
| | | | | | |
| Resolution | | | | | |
| RGB | 400 MHz RAMDAC, up to 2048 x 1536 @75 Hz (QXGA) including 1920 x 1080 @85 Hz (HDTV) | | 300 MHz RAMDAC, up to 2048 x 1536 @70 Hz (QXGA) including 1920 x 1080 @85 Hz (HDTV) | | |
| DVI | 1920 x 1080 | | | | |
| | | | | | |
| Slide in Disk | 1 slot equipped <br>● HDD or SSD | | | | |
| Compact Flash | 1 slot type 1 equipped <br>● 4 GB or 8 GB CF | | | | |
| Operating System[*1] | HDD or SSD: Windows® XP Professional SP3 CF: Windows® Embedded Standard 2009 | | HDD or SSD: Windows® XP Professional SP3/Windows® 7 Ultimate CF: Windows® Embedded Standard 2009/Windows® Embedded Standard 7[*2] | | |
| Slide in Slot | None | 1 slot equipped with: <br>● DVD-RW <br>● HDD, SSD and drive adapter also available | None | 1 slot equipped with: <br>● DVD-RW <br>● HDD, SSD and drive adapter also available | 2 slots with 1 equipped with: <br>● DVD-RW <br>● DVD-RW+HDD and DVD-RW+SSD also available |

| Element | Characteristics | | | | |
|---|---|---|---|---|---|
| | AtomN270 1 slot | AtomN270 2 slots | Core2Duo P8400 1 slot | Core2Duo P8400 2 slots | Core2Duo P8400 5 slots |
| Serial Interface | | | | | |
| Amount | 3 | | | | |
| Type | RS-232C, modem-capable, not electrically isolated x 1 RS-232C/422/485, RS-232C not modem compatible, electrically isolated x 1 (Optional) | | | | |
| UART | 16550-compatible, 16-byte FIFO | | | | |
| Transfer rate | 115 kBit/s | | | | |
| Connection | 9-pin D-SUB | | | | |
| | | | | | |
| USB Interface | | | | | |
| Amount | 5 | | | | |
| Type | USB 2.0 | | | | |
| Transfer rate | Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s) | | | | |
| Connection | Type A | | | | |
| Current load | Max. 500 mA per connection for USB2, USB4 Max 1 A per connection for USB1, USB3, USB5 | | | | |
| | | | | | |
| Ethernet Interface | | | | | |
| Amount | 2 | | | | |
| Speed | 10/100/1000 Mbit/s | | | | |
| Connection | RJ-45 Modular jack | | | | |
| | | | | | |
| DVI Interface | | | | | |
| Amount | 2 | | | | |
| Type | DVI-I x 1 DVI-D x 1 (Optional) | | | | |
| | | | | | |
| SRAM (in development) | | | | | |
| Battery-buffered | Yes | | | | |
| Quantity | 512 KB | | | | |
| | | | | | |
| Reset button | Yes | | | | |
| Buzzer | Yes | | | | |
| Power supply Rated voltage Rated current Inrush current | 24 Vdc ±25 % 6A Typically 7 A, 50 A < 300 µs | | | | |
| Battery backup UPS (in development) | Optional | | | | |

| Element | Characteristics | | | | |
|---|---|---|---|---|---|
| | AtomN270 1 slot | AtomN270 2 slots | Core2Duo P8400 1 slot | Core2Duo P8400 2 slots | Core2Duo P8400 5 slots |
| Outer dimensions (Width x Height x Depth) | 82 x 270 x 250 mm (3.23 x 10.63 x 9.85 in.) | 121 x 270 x 251 mm (4.76 x 10.63 x 9.89 in.) | 97 x 270 x 250 mm (3.82 x 10.63 x 9.85 in.) | 136 x 270 x 251 mm (5.35 x 10.63 x 9.89 in.) | 217 x 270 x 251 mm (8.54 x 10.63 x 9.89 in.) |
| Weight | Approx. 4.0 kg (8.8 lbs) | Approx. 5.0 kg (11.0 lbs) | Approx. 5.5 kg (12.1 lbs) | Approx. 6.0 kg (13.2 lbs) | Approx. 7.0 kg (15.4 lbs) |

[1] For details on languages supported by pre-installed operating systems, read "The List of OS Pre-installed Languages for Multi-language" (see page 45 ).

[2] The capacity of Windows® Embedded Standard 7 CF Card is 8GB only.

**The List of OS Pre-installed Languages for Multi-language**

| | Windows® XP Professional | Windows® 7 Ultimate | Windows® Embedded Standard 2009 | Windows® Embedded Standard7 |
|---|---|---|---|---|
| Arabic | ✓ | ✓ | ✓ | *1 |
| Bulgarian | ✓ | ✓ | — | *1 |
| Chinese(Simplified) | ✓ | ✓ | ✓ | *1 |
| Chinese(Traditional) | ✓ | ✓ | ✓ | *1 |
| Croatian | ✓ | ✓ | — | *1 |
| Czech | ✓ | ✓ | ✓ | *1 |
| Danish | ✓ | ✓ | ✓ | *1 |
| Dutch | ✓ | ✓ | ✓ | *1 |
| English | ✓ | ✓ | ✓ | ✓ |
| Estonian | ✓ | ✓ | — | *1 |
| Finnish | ✓ | ✓ | ✓ | *1 |
| French | ✓ | ✓ | ✓ | ✓ |
| German | ✓ | ✓ | ✓ | ✓ |
| Greek | ✓ | ✓ | ✓ | *1 |
| Hebrew | ✓ | ✓ | ✓ | *1 |
| Hungarian | ✓ | ✓ | ✓ | *1 |
| Italian | ✓ | ✓ | ✓ | ✓ |
| Japanese | ✓ | ✓ | ✓ | ✓ |
| Korean | ✓ | ✓ | ✓ | *1 |
| Latvian | ✓ | — | — | *1 |
| Lithuanian | ✓ | ✓ | — | *1 |
| Norwegian | ✓ | ✓ | ✓ | *1 |
| Polish | ✓ | ✓ | ✓ | *1 |
| Portuguese | ✓ | ✓ | ✓ | *1 |
| Portuguese(Brazil) | ✓ | ✓ | ✓ | *1 |
| Romanian | ✓ | ✓ | — | *1 |
| Russian | ✓ | ✓ | ✓ | *1 |
| Serbian Latin | — | ✓ | — | *1 |
| Slovak | ✓ | ✓ | — | *1 |
| Slovenian | ✓ | ✓ | — | *1 |
| Spanish | ✓ | ✓ | ✓ | ✓ |
| Swedish | ✓ | ✓ | ✓ | *1 |
| Thai | ✓ | ✓ | — | *1 |
| Turkish | ✓ | ✓ | ✓ | *1 |
| Ukrainian | — | ✓ | — | *1 |

*1 The languages can be downloaded from Pro-face Home Page "Otasuke Pro!".
http://www.pro-face.com/otasuke/

# Environmental Characteristics

## Characteristics

The environmental characteristics of the PS-B unit are as follows:

| Characteristics | | Value | Standards |
|---|---|---|---|
| Degree of Protection | | IP 20 | EN/IEC 61131-2 |
| Pollution Degree | | For use in Pollution Degree 2 environment | EN/IEC 61131-2 |
| Surrounding air temperature during operation | | 0...50 °C (32...122 °F) [1] | EN/IEC 61131-2, UL508 |
| Storage temperature | | – 20...60 °C (– 4...140 °F) | IEC 60068-2-2 tests Bb and Ab, IEC 60068-2-14 tests Na and EN/IEC 61131-2 |
| Operating altitude | | 2000 m (6560 ft) max | EN/IEC 61131-2 |
| Vibration | Operation (continuous) | 2-9 Hz: 1.75 mm (0.07 in.) 9-200 Hz: 4.9 m/s$^2$ | IACS E10 and EN/IEC 60068-2-6 Fc |
| | Operation (occasional) | 2-9 Hz: 3.5 mm (0.14 in.) 9-200 Hz: 9.8 m/s$^2$ | |
| | Merchant navy (continuous) | 3-13.2 Hz: 1mm (0.04 in.) 13.2-100 Hz: 6.9 m/s$^2$ | |
| | Shock Resistance (in operation) | 147 m/s$^2$ / 11 ms | |
| Surrounding air humidity during operation | | 10...85 % RH (Wet bulb temperature: 29 °C (84.2 °F) max. - no condensation) | EN/IEC 60068-2-78 Ca |
| Storage humidity | | 10...85 % RH (Wet bulb temperature: 29 °C (84.2 °F) max. - no condensation) | EN/IEC 60068-2-30 Db |
| Electromagnetic Compatibility (EMC) | | Immunity to High Frequency Interference | EN/IEC 61131-2, IEC 61000-4x |
| | | Electromagnetic Emissions Class A | EN 55022/55011 |

[1] Surrounding air temperature depends on what feature or option you use.
   When you use PS-B unit without FAN unit (AtomN270)
      0...45°C(32... 113°F) when using Gigabit Ether
      5...40°C(41... 104°F) when using DVD-RW
   When you use PS-B unit with FAN unit (Core2Duo P8400)
      5...50°C(41... 122°F) when using DVD-RW

# Dimensions/Assembly

# 4

**Subject of this Chapter**

This chapter concerns the dimensions and the panel mounting of products.
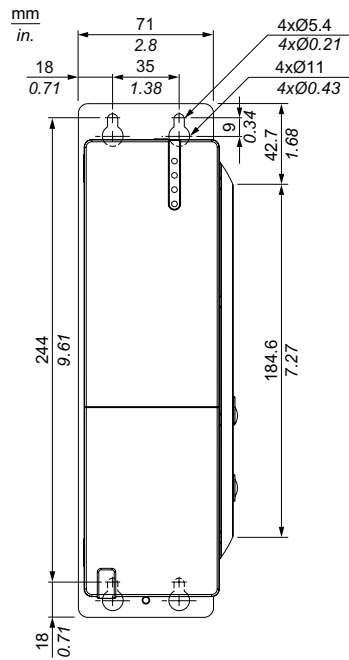
**What's in this Chapter?**

This chapter contains the following topics:

# Dimensions

### Dimensions of the 1 slot Unit

The illustration below shows the dimensions of front view.



The illustration below shows the dimensions of side view.

This illustration below shows the dimensions of top view.



## Dimensions of the 2 slot Unit

This illustration below shows the dimensions of front view.

This illustration below shows the dimensions of side view.
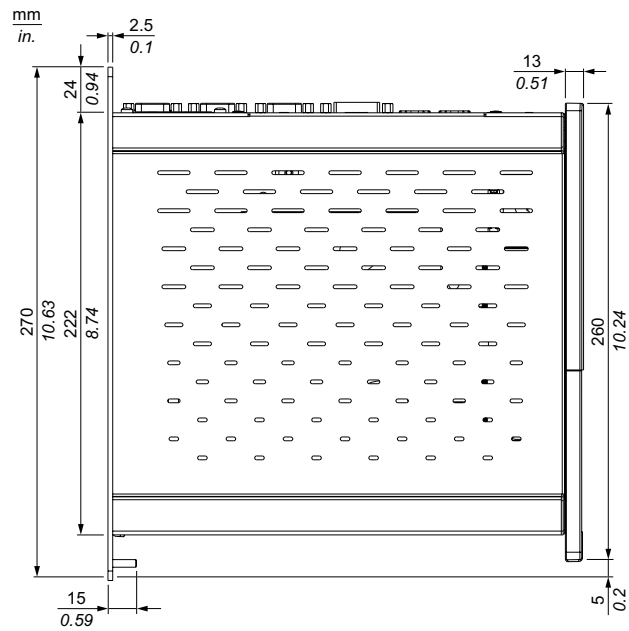
This illustration below shows the dimensions of top view.
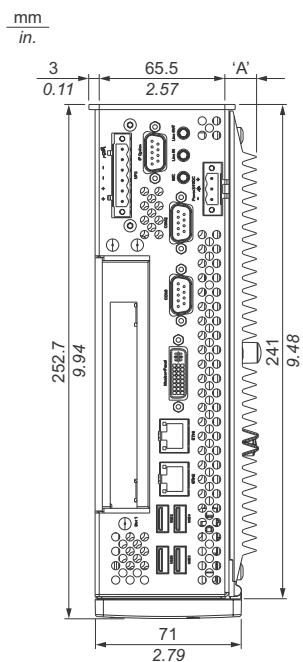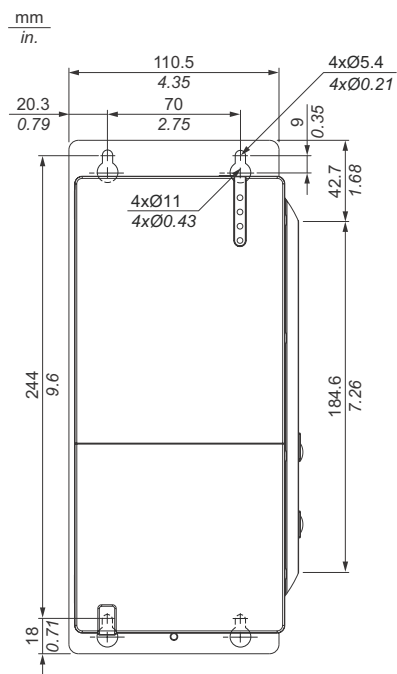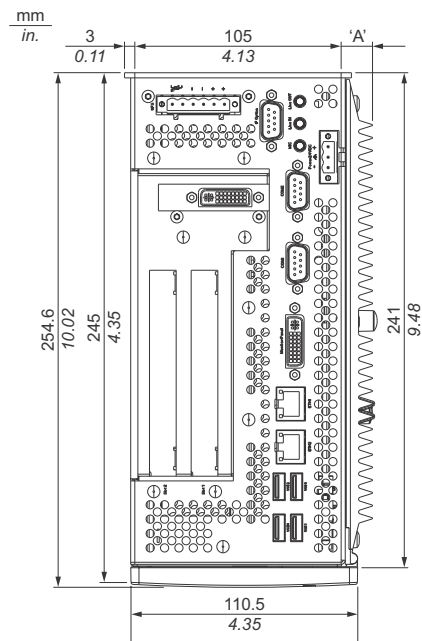
**Dimensions of the 5 slot Unit**

This illustration below shows the dimensions of front view.
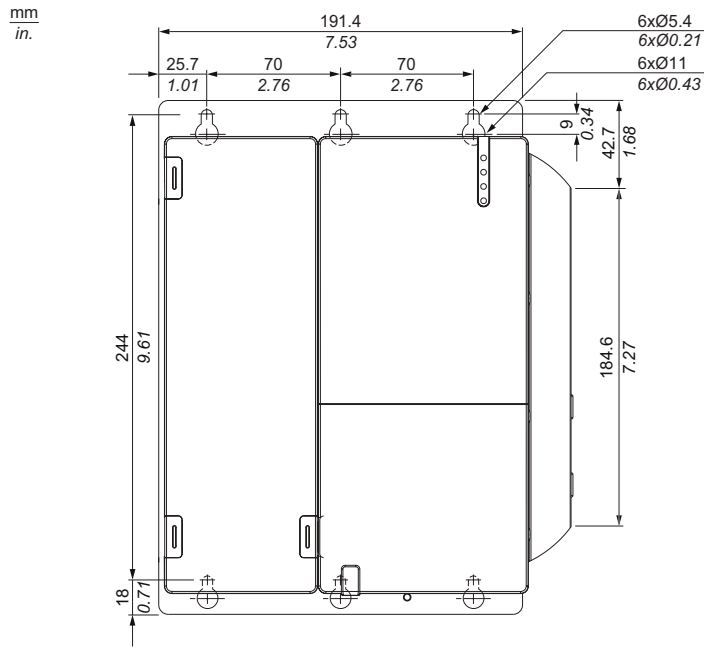
This illustration below shows the dimensions of side view.

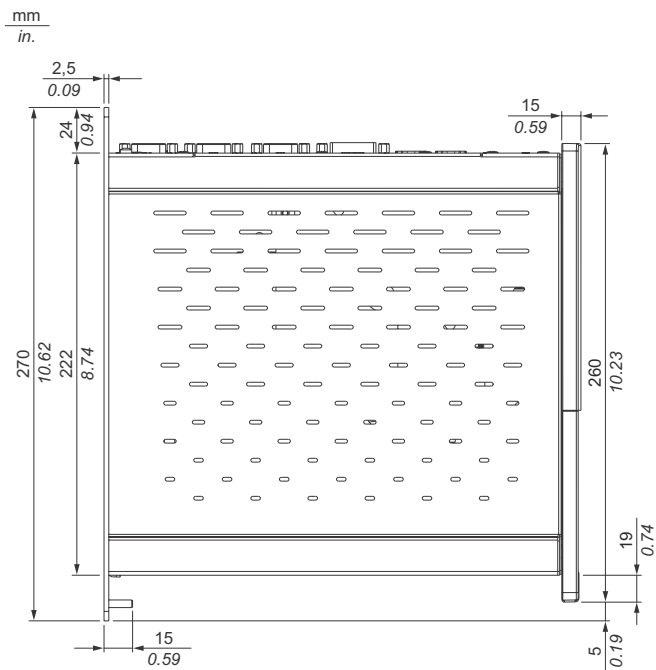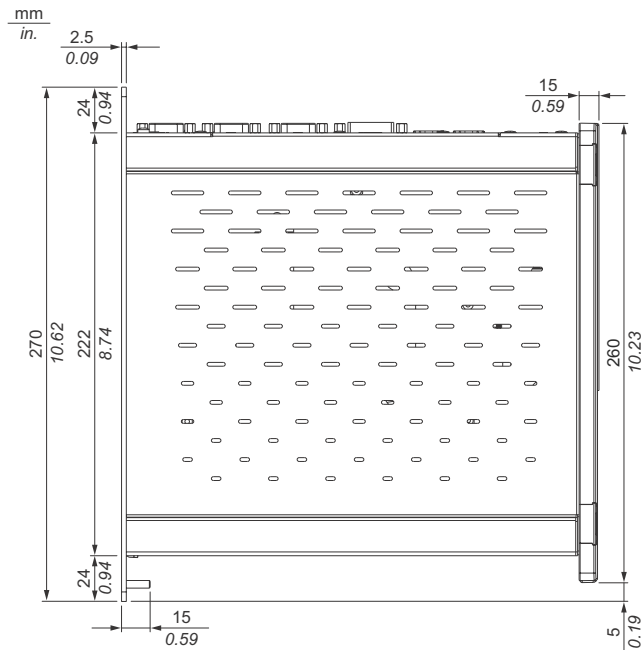This illustration below shows the dimensions of top view.
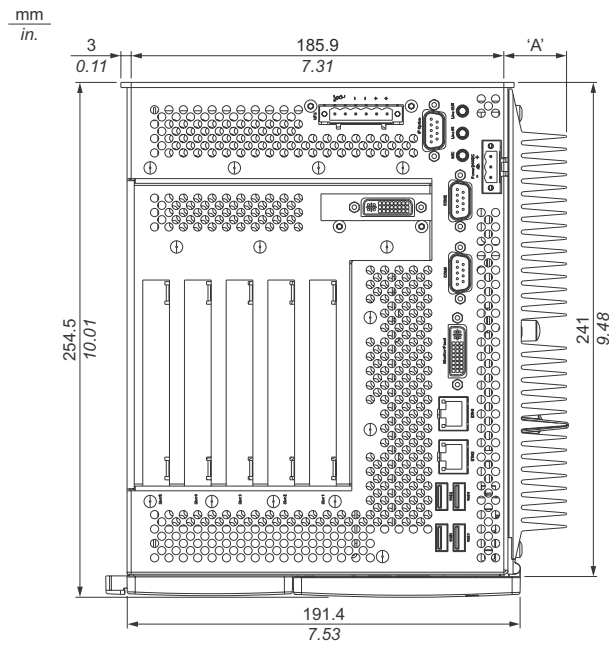


**Values**

Measurement "A" depends on which heat sink is used

| | AtomN270 | Core2Duo PS8400 |
|---|---|---|
| 1 Slot Unit 2 Slot Unit | 12.8mm (0.503 in) | 28 mm (1.103 in) |
| 5 Slot Unit | — | |

| Nominal measurement area | General tolerance acc. DIN ISO 2768 medium |
|---|---|
| up to 6mm (up to 0.236 in) | ± 0.1 mm (± 0.004 in) |
| over 6 to 30 mm (over 0.236 to 1.181 in) | ± 0.2 mm (± 0.0078 in) |
| over 30 to 120 mm (over 1.18 to 4.724 in) | ± 0.3 mm (± 0.012 in) |
| over 120 to 400 mm (over 4.724 in to 15.747 in) | ± 0.5 mm (± 0.02 in) |
| over 400 to 1000 mm (over 15.747 to 39.37 in) | ± 0.8 mm (± 0.031 in) |

## PS-B Unit Mounting

### Installation Location

| ⚠ CAUTION |
|---|
| **UNINTENDED EQUIPMENT OPERATION**<br><br>Overheating can cause incorrect software behavior, therefore:<br><br>● Do not place the PS-B unit next to other devices that might cause overheating.<br>● Keep the PS-B unit away from arc-generating devices such as magnetic switches and non-fused breakers.<br>● Avoid using the PS-B unit in environments where corrosive gases are present.<br>● Install the PS-B unit in a location providing a minimum clearance of 60 mm (2.4 in.) on more on the left and right sides and 110 mm (4.3 in) or more above and below the product from all adjacent structures and equipment.<br>● Install the PS-B unit with sufficient clearance to provide for cable routing and cable connectors.<br><br>**Failure to follow these instructions can result in injury or equipment damage.** |

Mount the PS-B unit system with the mounting plates found on the housing. The plates are designed for M5 screws.
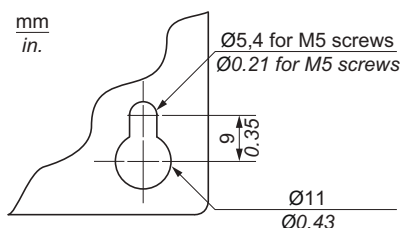


Use the Drilling templates to see the exact positioning of the mounting holes Drilling templates. *(see page 54)*

### Important mounting information

● Environmental Characteristics. *(see page 46)*
● The PS-B unit is only permitted for operation in closed rooms.
● The PS-B unit cannot be situated in direct sunlight.
● The vent holes must not be covered.
● When mounting the device, adhere to the allowable Mounting angle *(see page 56)*
● Be sure the wall or switching cabinet can support a minimum four times the total weight of the PS-B unit.
● When connecting certain cable types (DVI, USB, and so on), keep the flex radius of the cable in mind.

**Drilling templates**

Included with the PS-B unit are drilling templates that assist you with mounting the unit correctly.

| PS-B unit 1 slot | PS-B unit 2 slot |
|---|---|
| Mounting plate outline (PS-B unit) | Mounting plate outline (PS-B unit) |
|  |  |

**PS-B unit 5 slot**

Mounting plate outline (PS-B unit)
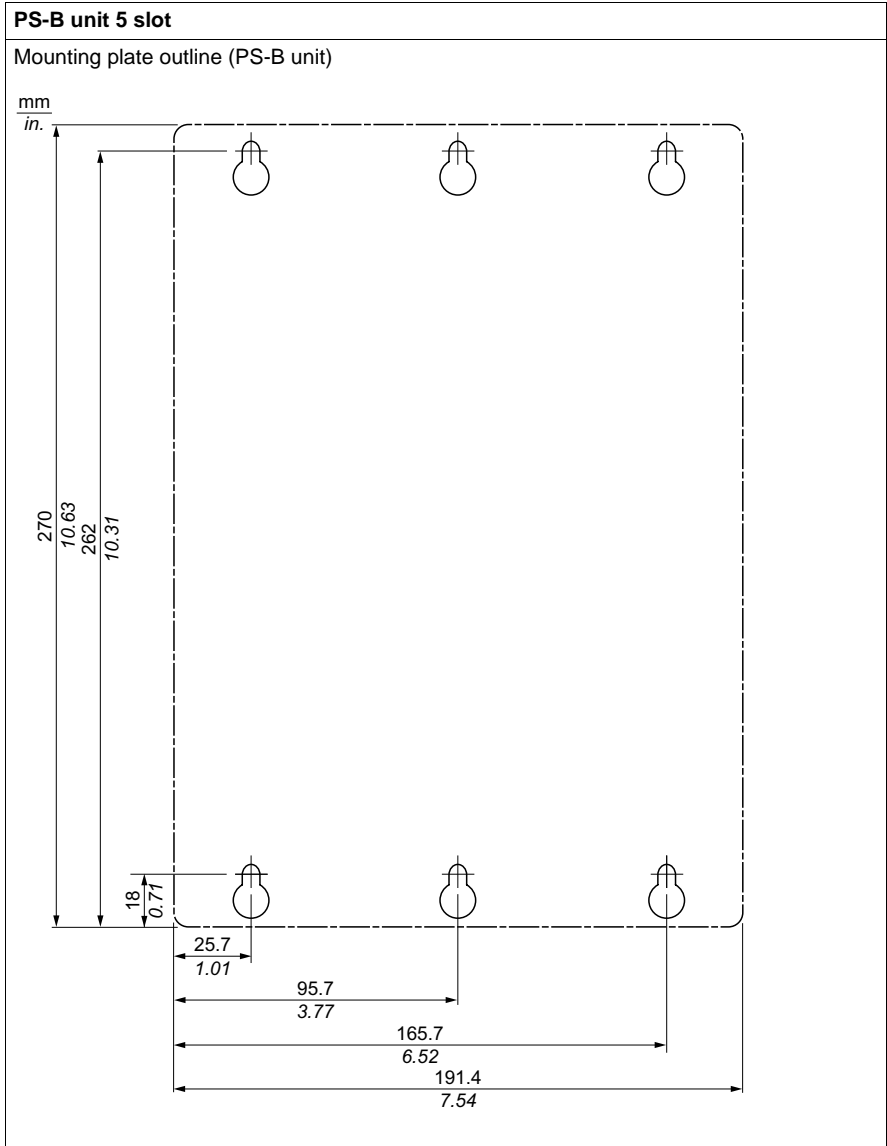
**Mounting angle**

The PS-B unit system must be mounted as described in the following figures.

### Standard mounting - vertical

Standard mounting refers to vertical mounting orientation. PS-B unit systems with or without a fan kit can be mounted this way.
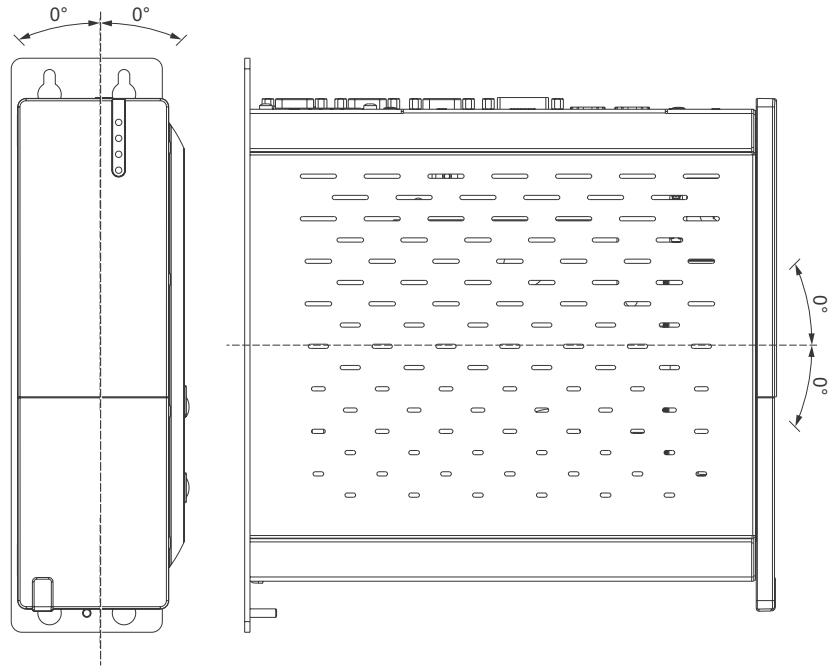


### Optional mounting - flat

Operation in the optional flat mounting position (heat sink on top) requires the use of a fan kit. The maximum ambient temperature specification must be lowered by 5°C (41°F).
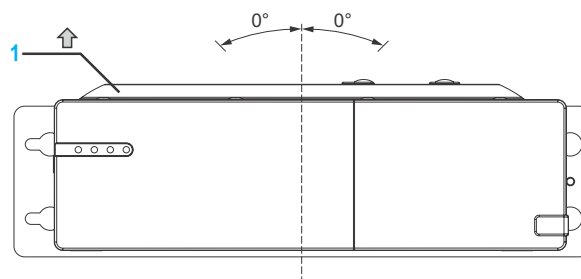


**1**   Heat sink

**Spacing for air circulation**

In order to guarantee sufficient air circulation, mount the system so that the spacing on the top, bottom, and sides is as follows:



**1** Air out
**2** Air in
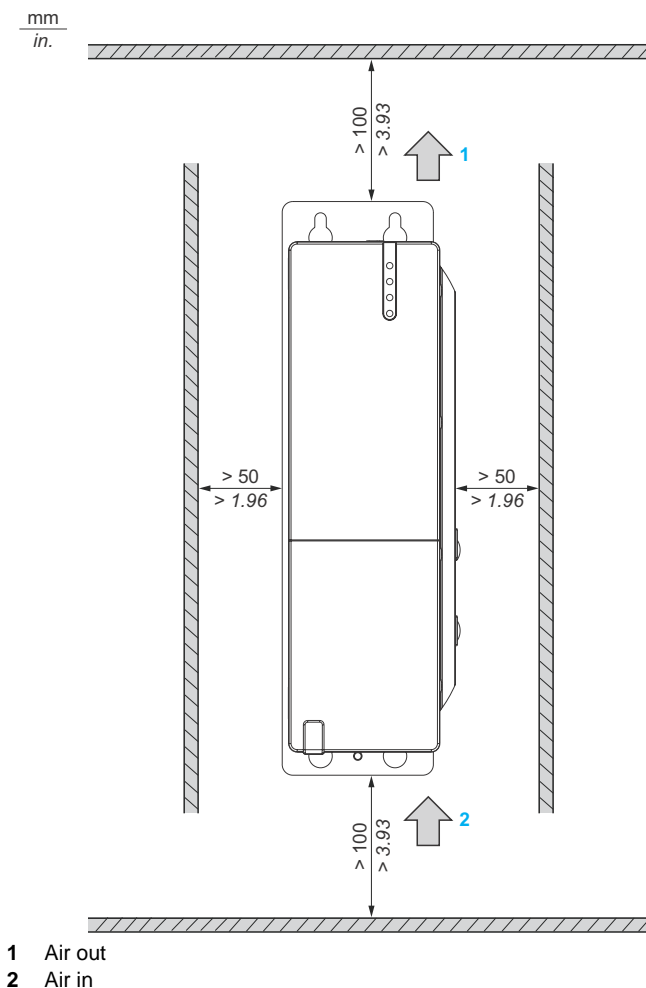
These defined distances are valid for both vertical and flat mounting of the PS-B unit.

## Preparing to Install the PS-B Unit

**Vibration and Shocks**

Extra care should be taken with respect to vibration levels when installing or moving the PS-B unit. If the PS-B unit is moved, for example, while it is installed in a rack equipped with caster wheels, the unit can receive excessive shock and vibration.

---

### ⚠ CAUTION

**EXCESSIVE VIBRATION**

- Plan your installation activities so that shock and vibration tolerances in the unit are not exceeded.
- The recommended torque for mounting the PS-B unit is 0.5 N•m (4.5 lb-in).

**Failure to follow these instructions can result in injury or equipment damage.**

---

# Implementation

**II**

**Subject of this Part**

This part describes setting up the product.

**What's in this Part?**

This part contains the following chapters:

| Chapter | Chapter Name | Page |
|---------|--------------|------|
| 5 | Getting Started | 61 |
| 6 | Main Power Connection | 63 |
| 7 | Configuration of the BIOS | 73 |
| 8 | Hardware Modifications | 87 |

# Getting Started

<div style="text-align: right">

**5**

</div>

## First Power-up

### License Agreement

**NOTE:** Limitations on your usage of the Windows XP Operating System are noted in Microsoft's End User License Agreement (EULA). Please read this document before first powering-up.

On first power-up of your PS-B unit, refer to "PS4000 Series Installation Guide".

### IEWF Manager Enhanced Write Filter

The PS-B unit CF Card model operating system, Windows® Embedded Standard 2009, is installed on a memory card. This card is a re-writable "Compact Flash" card that allows approximately 100,000 write operations.

The Enhanced Write Filter (EWF) Manager minimizes the number of write operations to help extend the life of the CF Card. It loads temporary data (for example, system updates and software operations) into RAM, and does not write this information to the CF Card.

As a result, when using the EWF, restarting the PS-B unit causes any changes the user made to the system to be cancelled. The following types of modifications may be cancelled if the EWF Manager is active and the system is restarted:

- Newly installed applications.
- Newly installed peripherals.
- Newly created or modified user accounts.
- Network configuration changes (e.g. IP address, default gateway, and so on.)
- Operating System customizations (e.g.background pictures, and so on.)

| CAUTION |
|---|
| **DATA AND CONFIGURATION LOSS** |
| - Disable the EWF Manager before making any permanent changes to the hardware, software, or Operating System of the PS-B unit. Confirm that the EWF icon in the Windows system tray has a red "X". <br> - Re-enable the EWF Manager after making permanent changes and confirm that the EWF icon in the Windows system tray does not have a red "X". This can help extend the operating life of the CF Card. <br> - Back up all CF Card data regularly to another storage media. |
| **Failure to follow these instructions can result in equipment damage.** |

**Enabling/Disabling the EWF Manager**

The status of the EWF Manager may be changed by running the `ChangeEWFstate.exe` program located in the `C:\Program files\Pro-face\EWF` directory. After running this program, a system restart is required for the change to take effect. Administrator privileges are required to enable and disable the EWF Manager.

# Main Power Connection

**6**

**Subject of this Chapter**

This chapter describes the connection of the PS-B unit to the main power supply.

**What's in this Chapter?**

This chapter contains the following topics:

## Grounding

### Overview

The grounding resistance between the PS-B unit's Functional Ground (FG) and Ground must be 100 $\Omega$ or less. When using a long grounding wire, check the resistance and if required replace a thin wire with a thicker wire and place it in a duct. In addition, please refer to the table below for maximum line lengths for various wire thicknesses.

### Ground Wire Dimensions

| Wire Thickness | Maximum Line Length |
| --- | --- |
| 2.5 mm$^2$ (13 AWG) | 30 m (98 ft.) |
| | 60 m (196 ft.) round trip. |

### Precaution

| ⚠ **WARNING** |
| --- |
| **UNINTENDED EQUIPMENT OPERATION** |
| ● Use only the authorized grounding configurations shown below.<br>● Confirm that the grounding resistance is 100 $\Omega$ or less.<br>● Test the quality of your ground connection before applying power to the device. Excess noise on the ground line can disrupt PS-B unit's operations. |
| **Failure to follow these instructions can result in death, serious injury, or equipment damage.** |

### Dedicated Ground

Connect the Functional Ground (FG) to a dedicated ground.
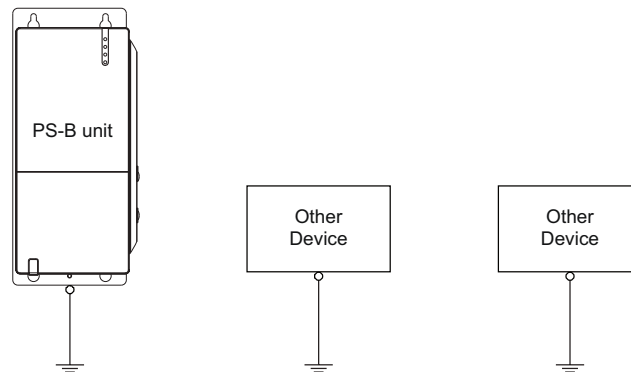


### Shared Ground Allowed

If a dedicated ground is not possible, use a shared ground, as shown.
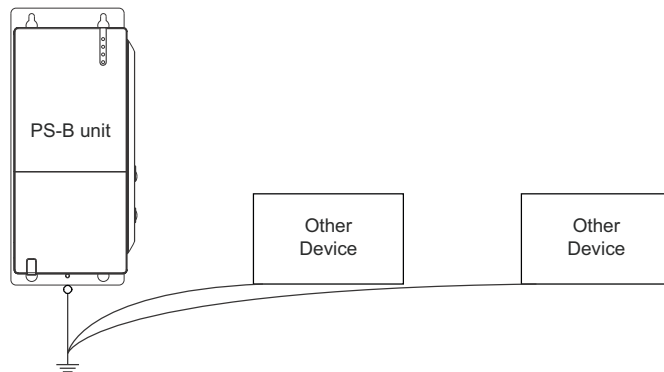
### Shared Ground not Allowed

Do not connect the PS-B unit to ground through other devices using the SG terminals.
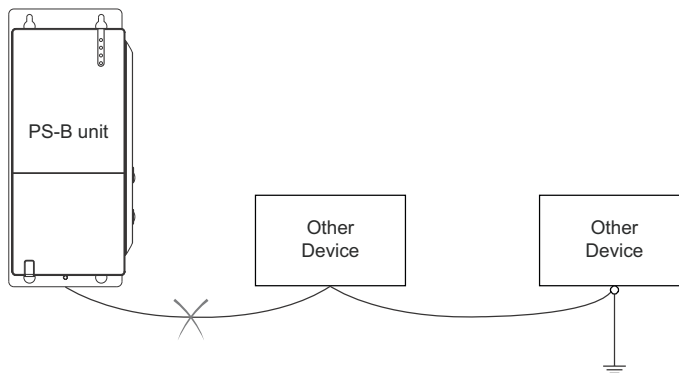


### Shared Ground - Avoid Ground Loop

When connecting an external device to a PS-B unit with the Shield Ground (SG), ensure that no ground loop is created. The PS-B unit's FG and SG are connected internally.

**Grounding Procedure**

When grounding, follow the procedure below:

| Step | Action |
|------|--------|
| 1 | Check that the grounding resistance is 100 Ω or less. |
| 2 | When connecting the SG line to another device, ensure that the design of the system/connection does not produce a ground loop.<br>**Note: The SG and FG terminals are connected internally in the PS-B unit.** |
| 3 | Wherever possible, use 2.5 mm$^2$ (13 AWG) wire to make the ground connection. If this isn't possible, ensure that the grounding wire gauge and length conform to the table in Ground Wire Dimensions *(see page 64)*. Create the connection point as close to PS-B unit as possible and make the wire as short as possible. |

**Grounding I/O Signal Lines**

# ⚠ DANGER

**EXPLOSION HAZARD**

- Always confirm the UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a PS-B unit installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect any cables or wires while the circuit is live unless the area is known to be free of ignitable concentrations of vapors, gases, and other flammable or combustible materials. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incendiary USB configuration *(see page 79)*.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

**Failure to follow these instructions will result in death or serious injury.**

# ⚠ WARNING

**UNINTENDED EQUIPMENT OPERATION**

- If wiring of I/O lines near power lines or radio equipment is unavoidable, use shielded cables and ground one end of the shield to the PS-B unit's Functional Ground (FG).
- Do not wire I/O lines in proximity to power cables, radio devices, or other equipment that may cause electromagnetic interference.

Electromagnetic radiation may interfere with the PS-B unit's control communications.

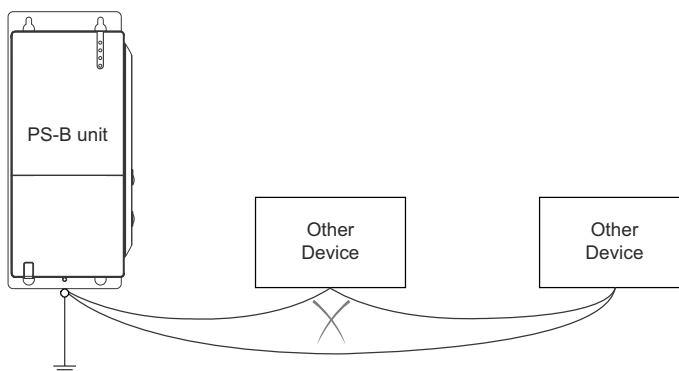**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

## Connecting the DC Power Cord

**Precaution**

When connecting the PS-B unit's power cable to the power connector on the unit, first ensure that the power cord is disconnected from the DC power supply.

---

### ⚠ **DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the PS-B unit and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the PS-B unit.
- The temperature rating of field installed conductions: 75°C (167°F) only.

**Failure to follow these instructions will result in death or serious injury.**
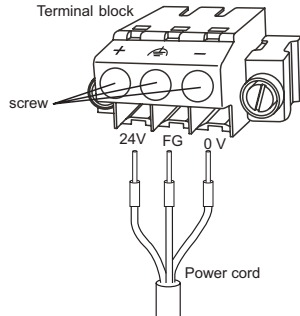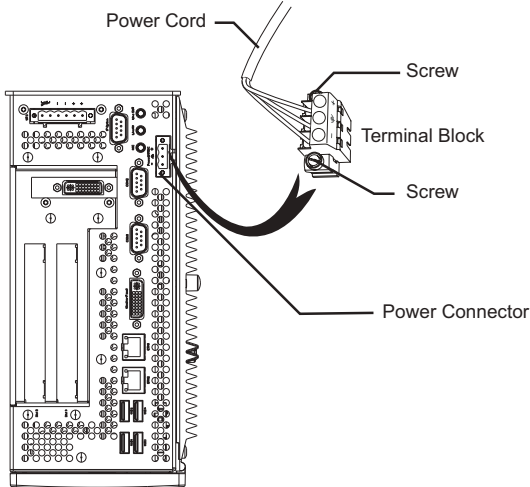
---

### ⚠ **WARNING**

**UNINTENDED EQUIPMENT OPERATION**

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration environment when making this determination.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only commercially available USB cables.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

---

**Wiring and Connecting the Terminal Block**

When wiring and connecting the PS-B unit power cables, follow the procedure below:

| Step | Action |
|---|---|
| 1 | Remove all power from the PS-B unit and confirm that the DC power supply has been disconnected from its power source. |
| 2 | Connect the power cord to the terminal block as shown below:<br>Insert each pin terminal into its designated hole and tighten the screw with a small slot screw driver.<br><br><br><br>Use wire with cross-section 0.75 mm² to 2.5 mm² (AWG18 to AWG12). |
| 3 | Place the terminal block in the power connector and tighten the screws. The recommended torque to tighten these screws is 0.5 N•m (4.5 lb-in):<br><br> |

**Possible Connections**

### Connection to a Floating (Ungrounded) DC Power System:

Some specific applications require the use of a floating (ungrounded) power system. The characteristics of such as system, are as follows:
- The 0 Vdc power line and Functional Ground (FG) are connected internally.
- The 24 Vdc power line is isolated from the FG and from the outputs. The dielectric strength for these are:
  - Primary/Secondary: 1000 Vac
  - Primary/Ground: 1000 Vac
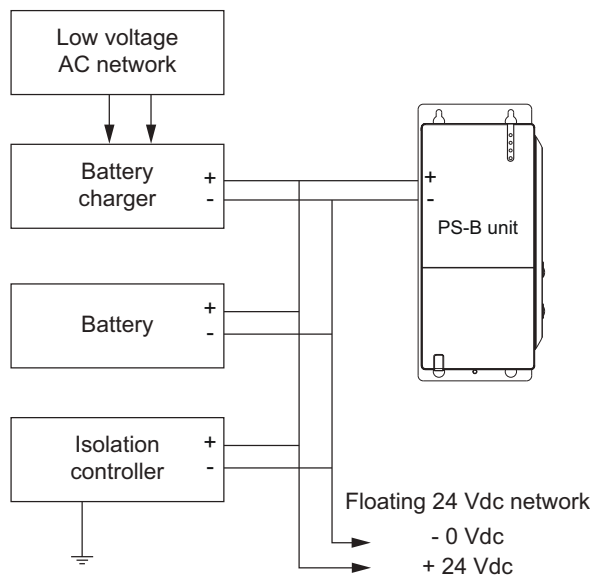


### Connection to a Ground-Referenced DC Power System:
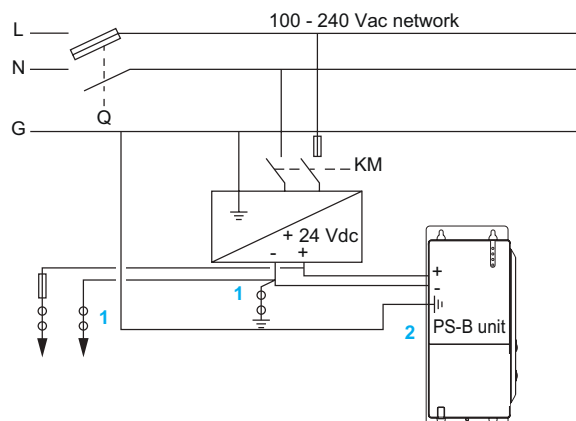


**Q**   : Main Power Contact
**KM** : Line contacts
**(1)** : Residual Current Detector for detecting grounding faults
**(2)** : PS-B unit

## USB Outlet on the PS-B Unit

**Introduction**

The information below describes usage of the USB outlet located on PS-B unit in Class I, Division 2 Groups A, B, C, and D hazardous locations.

---

## ⚠ **DANGER**

**EXPLOSION HAZARD**

● Always confirm the UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
● To power on or power off a PS-B unit installed in a Class I, Division 2 hazardous location, you must either:
  ● Use a switch located outside the hazardous environment, or
  ● Use a switch certified for Class I, Division 1 operation inside the hazardous area.
● Do not connect or disconnect any cables or wires while the circuit is live unless the area is known to be free of ignitable concentrations of vapors, gases, and other flammable or combustible materials. This applies to all connections including power, ground, serial, parallel, and network connections.
● Never use unshielded / ungrounded cables in hazardous locations.
● Use only non-incendiary USB configuration *(see page 79)*.
● When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

**Failure to follow these instructions will result in death or serious injury.**

---

**Description**

Non-incendiary equipment (keyboards, mouse) are permitted for use on the PS-B unit USB port. In addition to being non-incendiary, any equipment connected to the USB port must satisfy the following criteria.

PS-B unit                                    Mouse/Keyboard

USB Pin Description
1. Vcc
2. D-
3. D+
4. GND

(See note 1 for detail)

**Shield. Gnd**

1   2   3   4

Associated
Non-incendiary Field
Wiring Apparatus
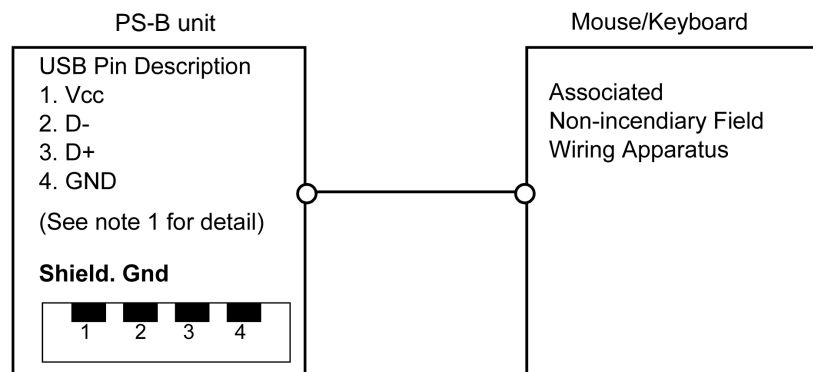
Notes:

1. Non-incendiary Circuit Parameters:

| USB Port: | |
|---|---|
| Open-circuit voltage | $V_{oc} = 5.26$ V |
| Short-circuit current | $I_{sc} = 1.3$ A |
| Associated capacitance | $C_a = 20$ μF |
| Associated inductance | $L_a = 16$ μH |

2. Associated Non-incendiary Field Wiring Apparatus shall satisfy the following:

| Associated Non-incendiary Field Wiring Apparatus (Mouse, Keyboard) | - | PS-B Unit |
|---|---|---|
| Voc | ≤ | Vmax |
| Isc | ≤ | Imax |
| Ca | ≥ | Ci + C cable |
| La | ≥ | Li + L cable |

3. If the electrical parameters of the cable are unknown, the following values may be used: Capacitance = 196.85 pF/m (60 pF/ft) and Inductive = 0.656 μH/m (0.20 μH/ft).

4. Non-incendiary Field Wiring must be installed in accordance with article 501.10(B)(3) of the National Electrical Code ANSI/NFPA 70.

5. Associated Non-incendiary Field wiring Apparatus shall not contain or be connected to another source of power.

# Configuration of the BIOS

# 7

**What's in this Chapter?**

This chapter contains the following topics:

# BIOS Options

### General Information

BIOS stands for "Basic Input Output System". It is the most basic communication between the user and the hardware.

The BIOS Setup Utility lets you modify basic system configuration settings. These settings are stored in CMOS and in an EEPROM (as a backup).

The CMOS data is buffered by a battery (if present), and remains in the PS-B unit even when the power is turned off ( 24 Vdc power supply is disconnected).

### BIOS Setup and Boot Procedure

BIOS is immediately activated when switching on the power supply of the PS-B unit or pressing the power button. The system checks if the setup data from the EEPROM is "OK". If the data is "OK", then it is transferred to the CMOS. If the data is "not OK", then the CMOS data is checked for validity. A message appears if the CMOS data contains anomalies, but you can continue the boot procedure by pressing the [F1] key. To prevent the message from appearing at each restart, open the BIOS setup by pressing the [Del] key and re-save the settings.

BIOS reads the system configuration information in CMOS RAM, checks the system, and configures it using the Power On Self Test (POST).

When these "preliminaries" are complete, the BIOS seeks the operating system from the data storage devices available (hard drive, floppy drive, etc.). BIOS launches the operating system and hands over to the operating system control of system operations.
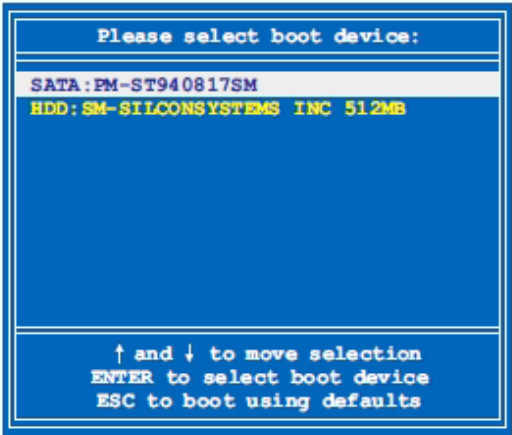
To enter BIOS Setup, the [DEL] key must be pressed after the USB controller has been initialized as soon as the following message appears on the monitor (during POST):

"Press DEL to run SETUP"
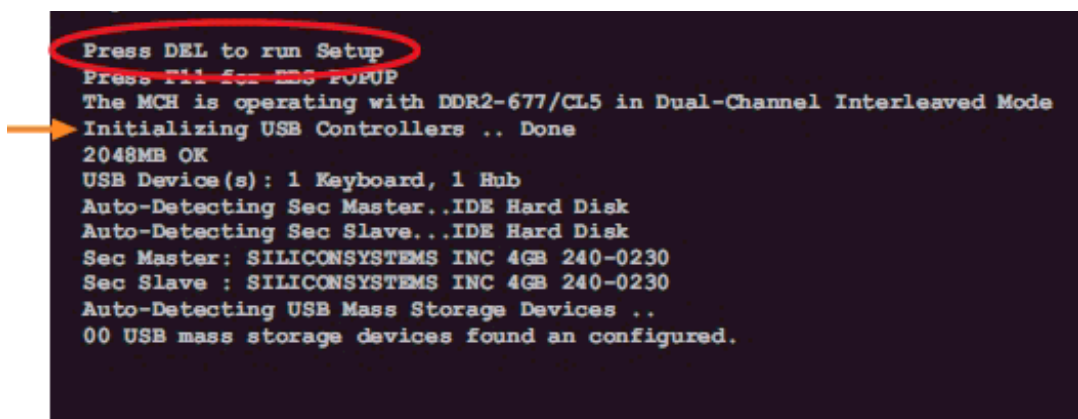
**BIOS Setup Keys**

The following keys are enabled during the POST:

| Key | Function |
| --- | --- |
| Del | Enters the BIOS setup menu |
| F12 | Using the F12 key, you can boot from the network |
| F11 | Displays the boot menu. Lists all bootable devices that are connected to the system. With cursor ↑ and cursor ↓ and by pressing <ENTER>, select the device used for the boot.  |
| Pause | Pressing the [pause] key stops the POST. Press any other key to resume the POST. |

**NOTE:** The key signals from the USB keyboard are only registered after the USB controller has been initialized.

The following keys can be used after entering the BIOS setup:

| Key | Function |
| --- | --- |
| F1 | General help. |
| Cursor ↑ | Moves to the previous item. |
| Cursor ↓ | Goes to the next item. |
| Cursor ← | Moves to the previous item. |
| Cursor → | Goes to the next item. |
| ± | Changes the value of the selected item. |
| Enter | Changes to the selected menu. |
| PgUp ↑ | Changes to the previous page. |
| PgDn ↓ | Changes to the next page. |
| Start | Jumps to the first BIOS menu item or object. |
| End | Jumps to the last BIOS menu item or object. |
| F2/F3 | Switches the colors of the BIOS setup. |
| F7 | Resets any changes. |
| F9 | Loads these settings for all BIOS configurations. |
| F10 | Saves and closes. |
| Esc | Exits the submenu. |

**Main**

Immediately after the [DEL] key is pressed during startup, the main BIOS setup menu appears:

```
                    BIOS SETUP UTILITY
   Main    Advanced    Boot    Security    Power    Exit

  System Time                [10:50:16]        Use [ENTER], [TAB]
  System Date                [Wed 04/06/2009]  or [SHIFT-TAB] to
                                               select a field.
  BIOS ID       : APC2R114
                                               Use [+] or [-] to
  Processor     : Intel(R) Core(TM)2 CPU T7400  configure system Time.
  CPU Frequency : 2166MHZ

  System Memory : 2048MB

  Board Information
  Product Revision  : C.0                       ←→    Select Screen
  Serial Number     : 133448                    ↑↓    Select Item
  BC Firmware Rev.  : 907                        +-    Change Field
  MAC Address (ETH1): 00:13:95:00:F2:90         Tab   Select Field
  Boot Counter      : 37                         F1    General Help
  Running Time      : 16h                        F10   Save and Exit
                                                 ESC   Exit

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```

| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| System Time | This is the current time setting. The time is maintained by the battery (CMOS battery) when the unit is turned off. | Adjustment of the time | Set the time in the format Hour:Minute:Second (hh:mm:ss). |
| System Date | This is the current date setting. The time is maintained by the battery (CMOS battery) when the unit is turned off. | Changes to the date | Set the date in the format Month:Day:Year (mm:dd:yyyy) |
| BIOS ID | Displays the BIOS detected. | None | - |
| Processor | Displays the processor type | None | - |
| CPU frequency | Displays the processor frequency | None | - |
| System memory | Displays the system memory size | None | - |
| Product revision | Displays the CPU board HW revision. | None | - |
| Serial number | Displays the CPU board serial number. | None | - |
| BC Firmware rev. | Displays the CPU board controller firmware revision. | None | - |

| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| MAC Adresse (ETH1 | Displays the MAC addresses assigned for the ETH1 interface. | None | - |
| Boot counter | Displays the boot counter - each restart increments the counter by one (max.16777215). | None | - |
| Running time | Displays the running time in hours. (max. 65535). | None | - |

**Advanced**
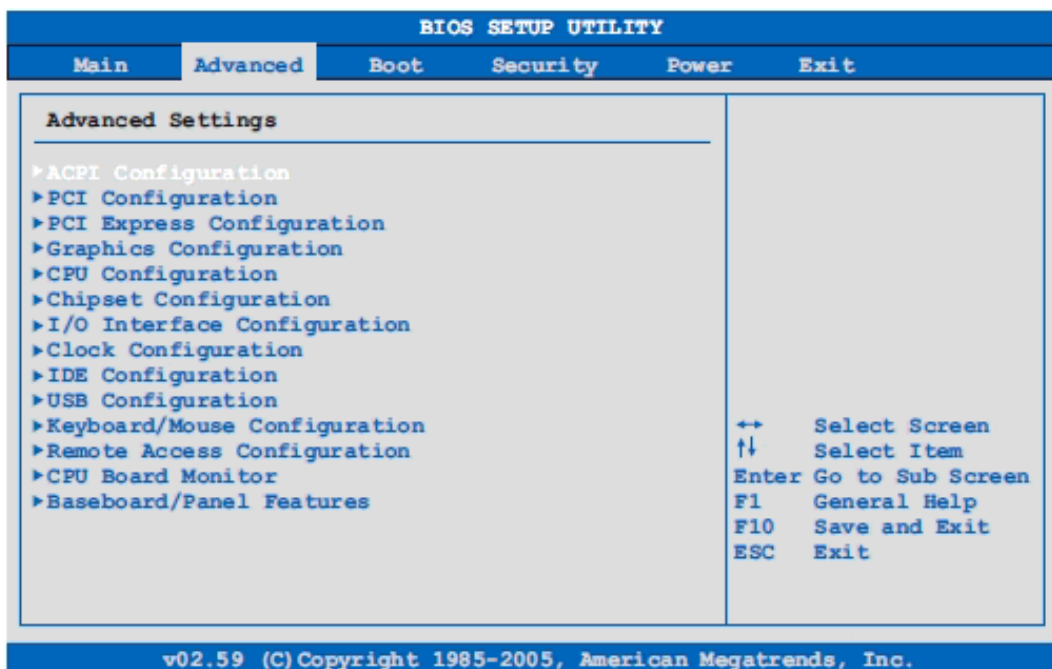


| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| ACPI configuration | Configures APCI devices. | Enter | Opens submenu |
| PCI configuration | Configures PCI devices. | Enter | Opens submenu |
| PCI Express Configuration | Configures the PCI Express. | Enter | Opens submenu |
| Graphics configuration | Configures the graphic settings. | Enter | Opens submenu |
| CPU configuration | Configures CPU settings. | Enter | Opens submenu |
| Chipset configuration | Configures the chipset functions. | Enter | Open submenu |
| I/O interface configuration | Configures the I/O devices. | Enter | Opens submenu |
| Clock configuration | Configures clock settings. | Enter | Opens submenu |
| IDE Configuration | Configures the IDE functions. | Enter | Opens submenu |

| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| USB configuration | Configures USB settings | Enter | Opens submenu |
| Keyboard/mouse configuration | Configures the keyboard/mouse options | Enter | Opens submenu |
| Remote access configuration | Configures the remote access settings. | Enter | Opens submenu |
| CPU board monitor | Displays the current voltage and temperature of the processor | Enter | Opens submenu |
| Baseboard/panel features | Displays device specific information and setup of device specific values. | Enter | Opens submenu |

# USB Configuration

## USB Configuration

```
                        BIOS SETUP UTILITY
    Advanced

 USB Configuration                              Options

 USB Devices Enabled   :                     Disabled
   1 Keyboard, 1 Hub                          2 USB Ports
                                              4 USB Ports
 USB Functions              [8 USB Ports]     6 USB Ports
 USB 2.0 Controller         [Enabled]         8 USB Ports

 Legacy USB Support         [Enabled]
 USB Legacy POST-Always     [Enabled]
 USB Keyboard Legacy Support [Enabled]
 USB Mouse Legacy Support   [Disabled]
 USB Storage Device Support [Enabled]
 Port 64/60 Emulation       [Disabled]    ←→    Select Screen
 USB 2.0 Controller Mode    [HiSpeed]     ↑↓    Select Item
 BIOS EHCI Hand-Off         [Disabled]    +-    Change Option
 USB Beep Message           [Enabled]     F1    General Help
 USB Stick Default Emulation [Hard Disk]  F10   Save and Exit
 USB Mass Storage Reset Delay [20 Sec]    ESC   Exit


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```

| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| USB Functions | You can enable or disable USB ports here. USB port numbers (e.g. USB1, USB3, and so on) are printed on the PS-B unit housing. | Disabled | Disables the USB port |
| | | 2 USB ports | USB1, USB3 are enabled. |
| | | 4 USB ports | USB1, USB2, USB3, USB4, are enabled. |
| | | 6 USB ports | USB1, USB2, USB3, USB4, USB5 are enabled |
| | | 8 USB ports | |
| USB 2.0 Controller | Option for enabling or disabling USB 2.0. | Enabled | All USB interfaces run in USB 2.0 mode. |
| | | Disabled | All USB interfaces run in USB 1.1 mode. |
| Legacy USB Support | Legacy USB support can be enabled/disabled here. USB interfaces do not function during startup. USB is supported after the operating system has started. A USB keyboard is recognized during the POST. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| | | Auto | Automatic enabling. |

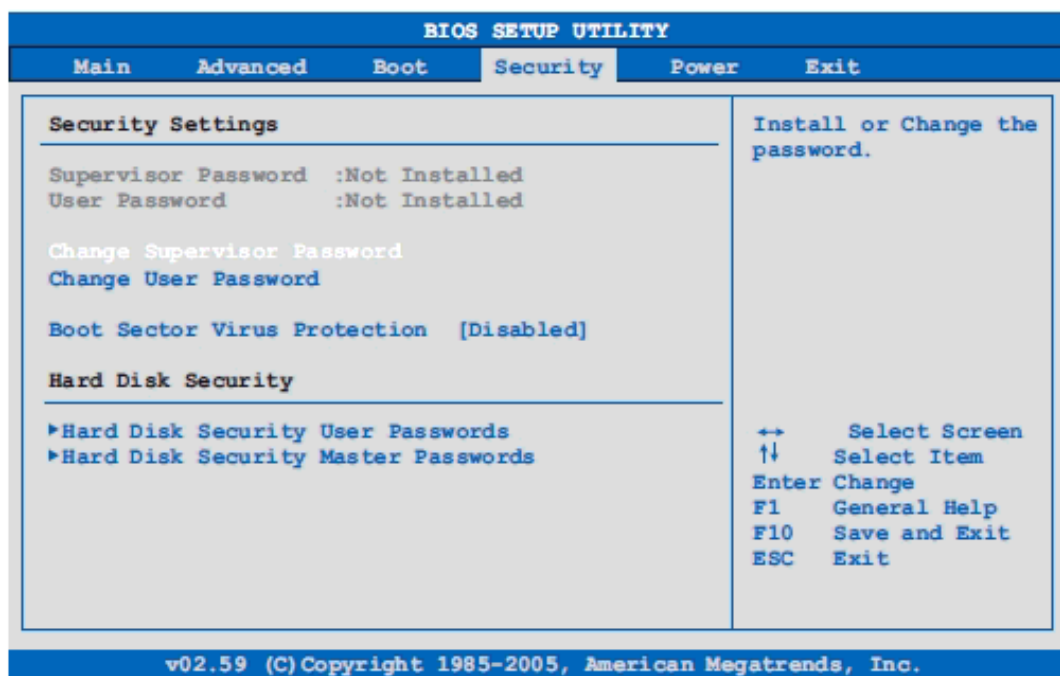| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| USB Legacy POST-Always | Option to enable Legacy USB Support during the POST (Power On Self Test), the same as the Legacy USB Support setting. | Enabled | Enables calling the BIOS Setup during the POST with a USB keyboard |
| | | Disabled | Disables this function |
| USB Keyboard Legacy Support | USB keyboard support can be enabled/disabled here. | Disabled | Disables this function |
| | | Enabled | Enables this function |
| USB Mouse Legacy Support | USB mouse support can be enabled/disabled here. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| USB Storage Device Support | USB storage device support can be enabled/disabled here. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| Port 64/60 Emulation | Port 64/60 emulation can be enabled/disabled here. | Disabled | USB keyboard functions in all systems excluding Windows NT. |
| | | Enabled | USB keyboard functions in Windows NT. |
| USB 2.0 Controller Mode | Defines settings for the USB controller. | Full speed | 12 Mbps |
| | | Hi speed | 480 Mbps |
| BIOS EHCI Hand-Off | Defines operating system support for the fully automatic EHCI function. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| USB Beep Message | Option for outputting a tone each time a USB device is detected by the BIOS during the POST. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| USB Stick Default Emulation | You can set how the USB device will be used. | Auto | USB devices with less than 530MB of memory are simulated as floppy disk drives. Devices with larger capacities are simulated as hard drives. |
| | | Hard disk | An HDD-formatted drive (such as Zip drive) can be used as a FDD for starting the system. |
| USB Mass Storage Reset Delay | You can define the amount of time the USB device POST waits after the device start command. **NOTE:** The message "No USB mass storage device detected" will appear if no USB memory device is installed. | 10 Sec, 20 Sec, 30 Sec, 40 Sec | Manually define the delay time. |

## Boot Menu

```
                    BIOS SETUP UTILITY
    Main    Advanced    Boot    Security    Power    Exit

   Boot Priority Selection       [Type Based]         The device based boot
                                                      priority list allows
   Boot Device Priority                               to select from a list
                                                      of currently detected
   1st Boot Device            [Primary Master]        devices.
   2nd Boot Device            [Primary Slave]         The type based boot
   3rd Boot Device            [USB Floppy]            priority list allows
   4th Boot Device            [USB Removable Devi]    to select device types
   5th Boot Device            [USB Harddisk]          even if a respective
   6th Boot Device            [USB CDROM]             device is not (yet)
   7th Boot Device            [Secondary Master]      present.
   8th Boot Device            [Secondary Slave]
                                                      ↔     Select Screen
   Boot Settings Configuration                        ↑↓    Select Item
                                                      +-    Change Option
   Quick Boot                 [Enabled]               F1    General Help
   Quiet Boot                 [Disabled]              F10   Save and Exit
   Automatic Boot List Retry  [Disabled]              ESC   Exit
   AddOn ROM Display Mode      [Keep Current]
   Halt On Error              [Disabled]
   Hit ´DEL´ Message Display  [Enabled]
   Interrupt 19 Capture       [Disabled]
   PXE Boot to LAN (ETH1)     [Disabled]
   Slide-In 2 Option-ROM      [Disabled]
   Power Loss Control         [Turn On]

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```

| Boot setting | Description | Setting options | Effect |
|---|---|---|---|
| Boot Priority Selection | You can define the drive used to boot up the machine. | Device based | Only devices that are recognized by the system are listed. You can change the sequence of items in the device list. |
| | | Type based | You can change the sequence of items in the device list. You can add to the list device types that are not connected. |
| 1st boot device<br>2nd boot device<br>3rd boot device<br>4th boot device<br>5th boot device<br>6th boot device<br>7th boot device<br>8th boot device | Use this option to define the boot drive. | Disabled, Primary Master, Primary Slave, Secondary Slave, Legacy Floppy, USB Floppy, USB CDROM, USB Removable Device, Onboard LAN, External LAN, PCI Mass Storage, PCI SCSI Card, Any PCI, BEV Device, Third Slave, PCI RAID, Local BEV ROM | Select the desired boot sequence. |

| Boot setting | Description | Setting options | Effect |
|---|---|---|---|
| Quick Boot | This function reduces the boot time by skipping some POST procedures. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| Quiet Boot | Determines if POST message or OEM logo (default = Black background) is displayed. | Disabled | POST message display |
| | | Enabled | OEM logo display instead of POST message. |
| Automatic Boot List Retry | With this option, the operating system attempts to automatically restart following startup failure. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| Add On ROM Display Mode | Sets the display mode for ROM (during the boot procedure). | Force BIOS | Displays an additional BIOS part. |
| | | Keep Current | Displays BIOS information. |
| Hold On Errors | This option sets whether the system should pause the Power On Self Test (POST) when it encounters an anomaly. | Disabled | The system does not pause. Ignores all anomalies. |
| | | Enabled | System pause. The system pauses every time an anomaly is encountered. |
| Hit 'DEL' Message Display | You can define to display the "Hit 'DEL' Message" on startup. **NOTE:** When Quiet Boot is enabled, the message will not display. | Disabled | The message does not displayed. |
| | | Enabled | The message will display. |
| Interrupt 19 Capture | Controls BIOS interrupt. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| PXE Boot to LAN (ETH1) | Enables/disables the ability to boot from LAN (ETH1). | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| Slide-In 2 Optional ROM | Enables/disables optional ROM for a slide-in 2 drive. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| Power Loss Control | Determines if the system turns on/off following power loss. | Remain Off | Remains off |
| | | Turn On | Powers on |
| | | Last State | Enables the previous state. |

## Security

```
                        BIOS SETUP UTILITY
   Main     Advanced     Boot     Security     Power     Exit

  Security Settings                            Install or Change the
                                               password.
  Supervisor Password   :Not Installed
  User Password         :Not Installed

  Change Supervisor Password
  Change User Password

  Boot Sector Virus Protection   [Disabled]

  Hard Disk Security
                                               ←→     Select Screen
  ▶Hard Disk Security User Passwords           ↑↓     Select Item
  ▶Hard Disk Security Master Passwords         Enter  Change
                                               F1     General Help
                                               F10    Save and Exit
                                               ESC    Exit


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```

| BIOS Setting | Description | Setting options | Effect |
|---|---|---|---|
| Supervisor Password | Displays whether or not a supervisor password has been set. | None | - |
| User Password | Displays whether or not a user password has been set. | None | - |
| Change Supervisor Password | Required to enter/change the supervisor password. A supervisor password is necessary to edit BIOS settings. | Enter | Enter password. |
| Change User Password | To enter/change a user password. A user password allows the user to edit certain BIOS settings. | Enter | Enter password. |

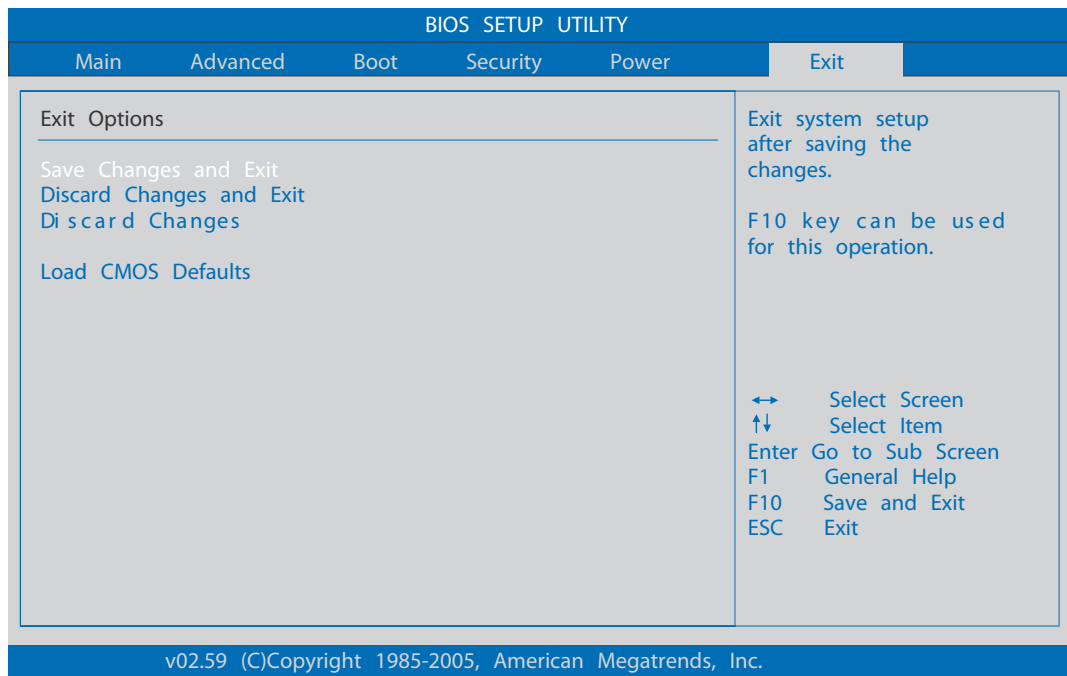| BIOS Setting | Description | Setting options | Effect |
|---|---|---|---|
| Boot Sector Virus Protection | With this option, a warning is issued when the boot sector is accessed through a program or virus.<br>**NOTE:** With this option, only the boot sector, not the entire hard drive, is protected. | Disabled | Disables this function. |
| | | Enabled | Enables this function. |
| Hard Disk Security User Password | You can create the hard disk security user password here. | Enter | Opens submenu. |
| Hard Disk Security Master Password | You can create the hard disk security master password here. | Enter | Opens submenu. |



| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| Primary Slave HDD User Password | With a valid user password, you can change or configure hard drives without rebooting the device. A user password allows the user to edit specific BIOS settings. | Enter | Enter password |
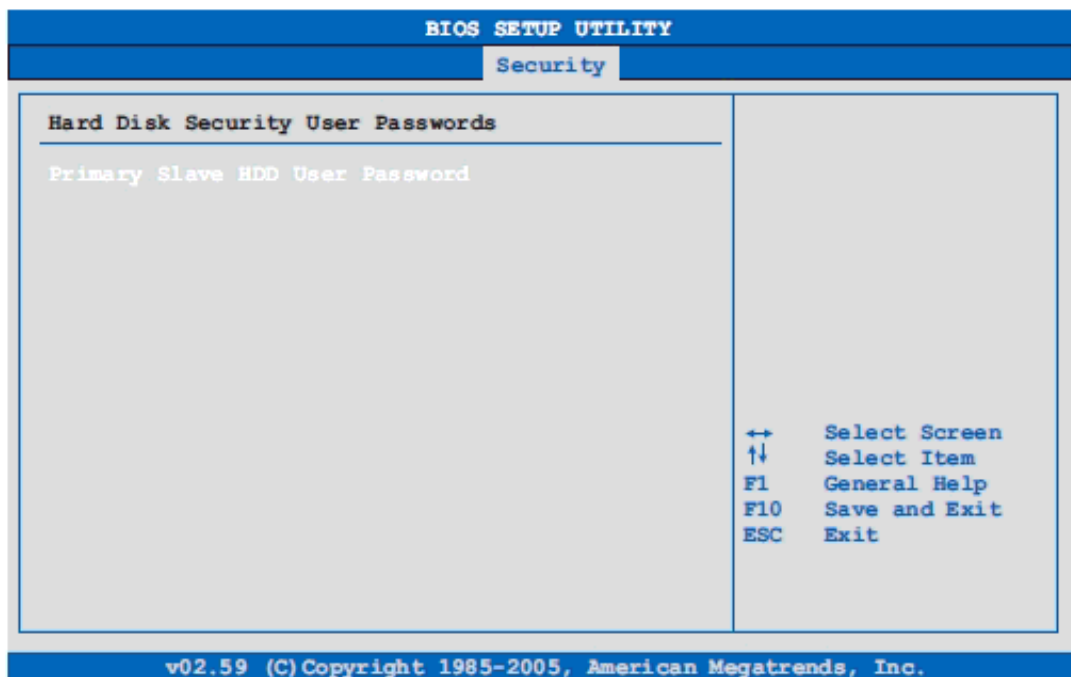
```
                        BIOS SETUP UTILITY
                              Security

  Hard Disk Security Master Passwords

    Primary Slave HDD Master Password



                                              ←→      Select Screen
                                              ↑↓      Select Item
                                              F1      General Help
                                              F10     Save and Exit
                                              ESC     Exit




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```
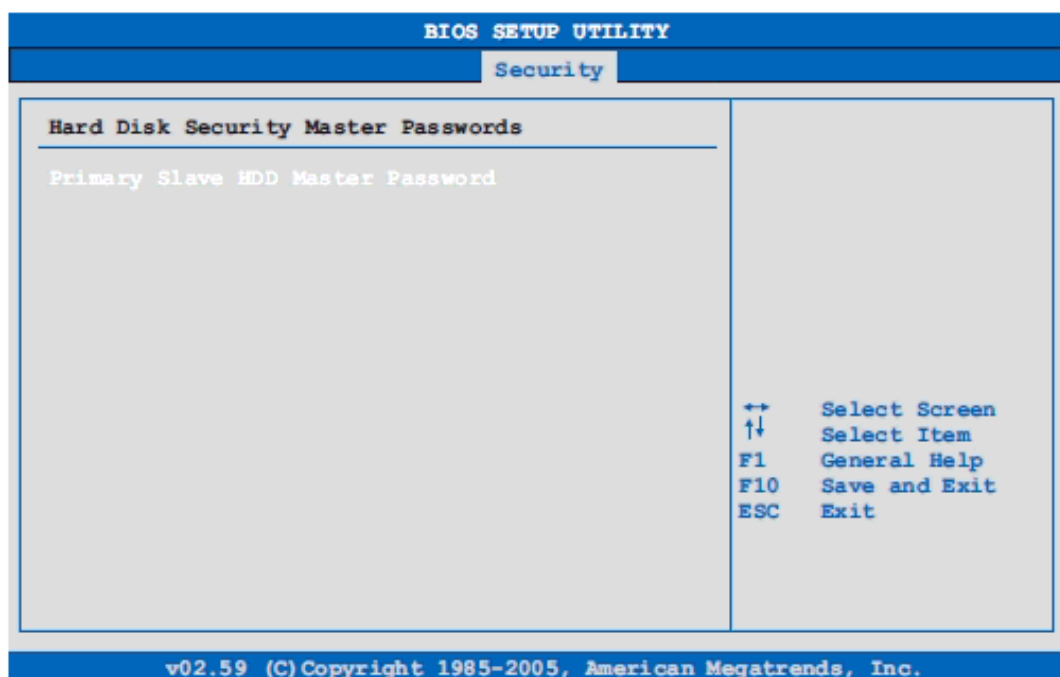
| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| Primary Slave HDD Master Password | With a valid user password, you can change or configure hard drives without rebooting the device. | Enter | Enter password |

# Exit

BIOS  SETUP  UTILITY

| Main | Advanced | Boot | Security | Power | | Exit | |

Exit  Options

Save  Changes  and  Exit
Discard  Changes  and  Exit
Di s c a r d  Cha nge s

Load  CMOS  Defaults

Exit  system  setup
after  saving  the
changes.

F10  key  can  be  us ed
for  this  operation.

←→      Select  Screen
↑↓      Select  Item
Enter  Go  to  Sub  Screen
F1      General  Help
F10     Save  and  Exit
ESC     Exit

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| BIOS setting | Description | Setting options | Effect |
|---|---|---|---|
| Save Changes and Exit | Displays a confirmation message box. On confirming you want to save changes to the BIOS settings, saves the new settings to CMOS, and restarts the system.. | OK / Cancel | - |
| Discard Changes and Exit | Exits the BIOS settings without making any changes, and restarts the system. | OK / Cancel | - |
| Discard Changes | Restores the previously saved BIOS settings and discards any changes that were made during the current session. | OK / Cancel | - |
| Load CMOS Defaults | Loads the CMOS default values, defined by the DIP switch settings. This command loads CMOS default values for all BIOS configurations. | OK / Cancel | - |

**BIOS default settings**

The CMOS profile switches, located on the front side of the unit near the LEDs, are used to load pre-defined BIOS profile settings, which are based on the position of the switches.

The switch positions at delivery represents the optimum BIOS default values and should not be changed.

# Hardware Modifications

<div style="text-align: right;">

**8**

</div>

**Subject of this Chapter**

This chapter concerns the hardware modifications for the PS-B unit.

A wide variety of optional units, Main Memory and CF Cards manufactured by Pro-face and commercial devices and boards can be used with this product.

**What's in this Chapter?**

This chapter contains the following topics:

## Before Modifications

### Overview

For detailed installation procedures for optional units, refer to the Installation Guide included with the optional unit.

---

# ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the PS-B unit and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the PS-B unit.

**Failure to follow these instructions will result in death or serious injury.**

---

# ⚠ DANGER

**EXPLOSION HAZARD**

- Always confirm the UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a PS-B unit installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or;
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect any cables or wires while the circuit is live unless the area is known to be free of ignitable concentrations of vapors, gases, and other flammable or combustible materials. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incendiary USB configuration *(see page 79)*.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

**Failure to follow these instructions will result in death or serious injury.**

---

# ⚠ WARNING

**RISK OF BURNING INJURY**

During operation, surface temperatures of the heat sink may reach 70°C (158°F).

Do not touch the surface of the heat sink during operation.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

---

# ⚠ CAUTION

**OVERTORQUE AND LOOSE HARDWARE**

- Do not exert more than 0.6 N•m (5.3 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the plastic casing of the PS-B unit.
- When installing or removing screws, ensure that they do not fall inside the PS-B unit's chassis.

**Failure to follow these instructions can result in injury or equipment damage.**

# ⚠ CAUTION

**STATIC SENSITIVE COMPONENTS**

PS-B unit internal components, including accessories such as RAM modules and expansion boards, can be damaged by static electricity.

- Keep static-producing materials (plastic, upholstery, carpeting) out of the immediate work area.
- Do not remove ESD-sensitive components from their anti-static bags until you are ready to install them.
- When handling static-sensitive components, wear a properly grounded wrist strap (or equivalent).
- Avoid unnecessary contact with exposed conductors and component leads with skin or clothing.

**Failure to follow these instructions can result in injury or equipment damage.**

## PCI / PCIe Card Installation

### Overview

Before installing or removing a PCI / PCIe card, shut down Windows® in an orderly fashion and remove all power from the device.

### ⚠ **DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

Read and understand the safety information in the section before modifications *(see page 88)* before attempting this procedure.

**Failure to follow these instructions will result in death or serious injury.**

### PCI / PCIe  Cards with Cables

When using a PCI / PCIe card with an external cable attached, install a clamp or other device to secure the cable.

### ⚠ **WARNING**

**EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION**

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration environment when making this determination.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only commercially available USB cables.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**
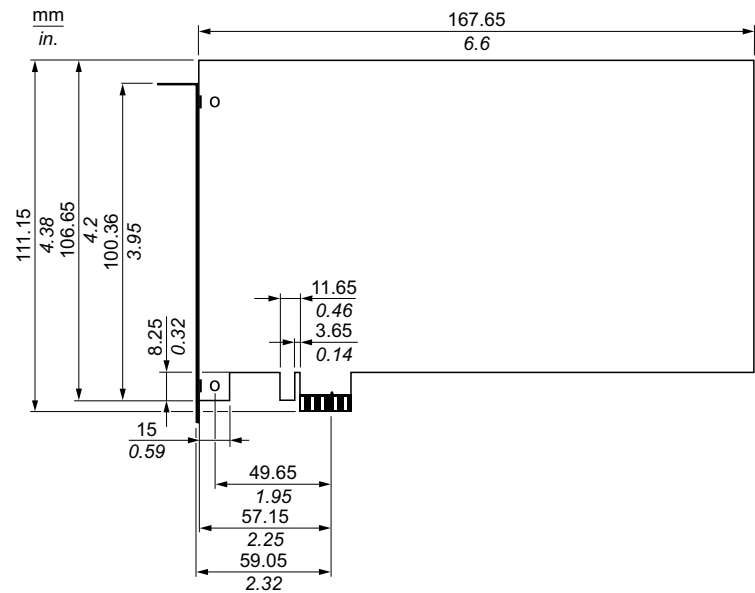
### Installing a PCI or PCIe Card

Depending on the bus type, you can use standard PCI 2.2 half-size cards or PCI Express (PCIe) half-size cards. They cannot exceed the following dimensions.

#### Dimensions - Standard half size PCI card
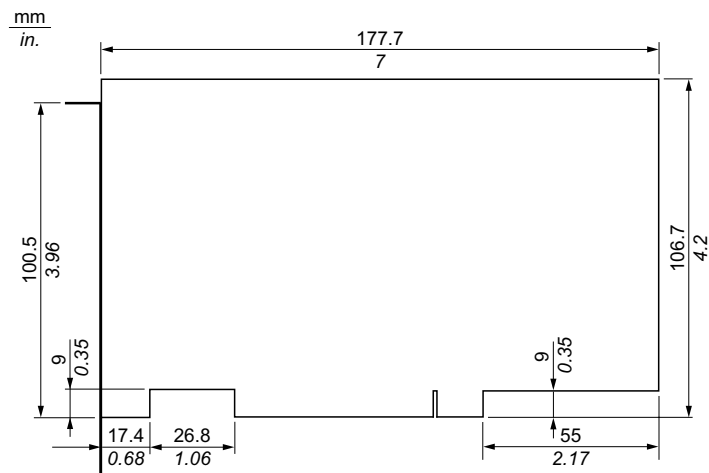
### Dimensions - Standard half size PCIe card



The table below describes how to install a PCI or PCIe card:

| Step | Action |
|------|--------|
| 1 | To install a PCI or PCIe card, open the blue side cover and loosen the screws of the PS-B unit as shown.  1 Slot Unit        2 Slot Unit          5 Slot Unit |
| 2 | Remove the side cover by pulling it backward. |
| 3 | Unscrew the screw from the empty panel and remove the blank panel. Insert the PCI/PCIe board into the expansion board connector and secure in place using the filler panel screw, with 0.5 to 0.6 N•m (4.5 to 5.3 lb-in) of torque. |
| 4 | Replace the side cover and secure it by inserting the screws. |

## Compact Flash (CF) Card Installation and Removal

### Preparing to use a CF Card

The PS-B unit operating system views the CF Card as a hard disk. Proper handling and care of the CF Card helps extend the life of the Card. Familiarize yourself with the Card prior to attempting insertion or removal of the Card.

## ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

Read and understand the safety information in the section Before modifications *(see page 88)* before attempting this procedure.

**Failure to follow these instructions will result in death or serious injury.**

## ⚠ CAUTION

**COMPACT FLASH CARD DAMAGE AND DATA LOSS**

● Remove all power before making any contact with an installed CF Card.
● Use only CF Cards manufactured by Pro-face. The performance of the PS-B unit has not been tested using CF Cards from other manufacturers
● Confirm that the CF Card is correctly oriented before insertion.
● Do not bend, drop, or strike the CF Card.
● Do not touch the CF Card connectors.
● Do not disassemble or modify the CF Card.
● Keep the CF Card dry.

**Failure to follow these instructions can result in injury or equipment damage.**

### Inserting the CF Card

The procedure below describes how to insert the CF Card.

| Step | Action |
|------|--------|
| 1 | Shut down Windows® in an orderly fashion and remove all power from the device. |
| 2 | Remove the CF Card cover. |
| 3 | Insert the CF Card firmly into the CF Card slot, and check that the eject button pops out. |
| 4 | Replace the CF Card cover. |

### Removing the CF Card

The procedure below describes how to remove the CF Card.

| Step | Action |
|------|--------|
| 1 | Shut down Windows® in an orderly fashion and remove all power from the device. |
| 2 | Remove the CF Card cover. |
| 3 | Press the eject button all the way to remove the CF Card from the CF Card slot. |
| 4 | After inserting/removing the CF Card, replace the CF Card cover. |

**Data Writing Limitation**

The CF Card is limited to approximately 100,000 write operations. Back up all CF Card data regularly to another storage media.

# Installation
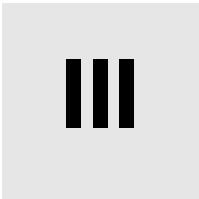
**Subject of this Part**

This part describes the product installation.

**What's in this Part?**

This part contains the following chapters:

# System Monitor Setting

# 9

## System Monitor Setting

### Presentation

The System Monitor Setting software alerts you if thresholds are exceeded with a popup message or an alarm window, you can also configure actions to undertake such as shutdown the PS-B unit.
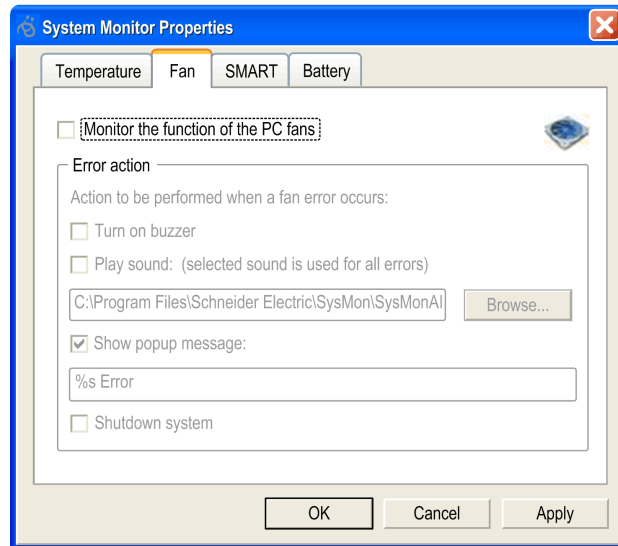
### System Monitor Properties - Temperature

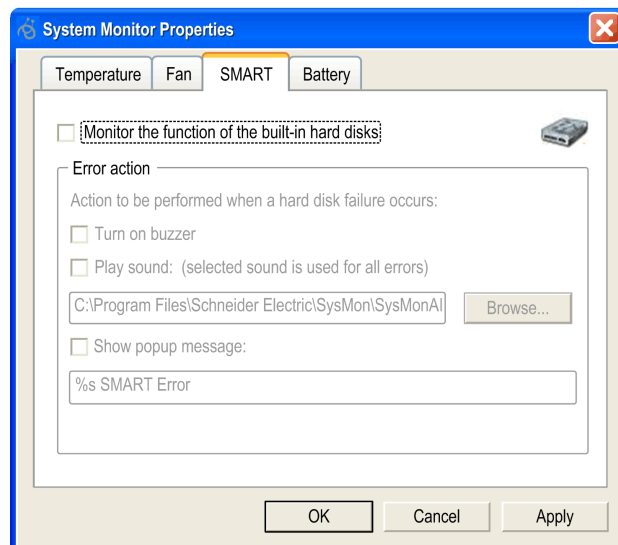The screenshot below shows the Temperature parameters tab, the contents are described later *(see page 99)*:
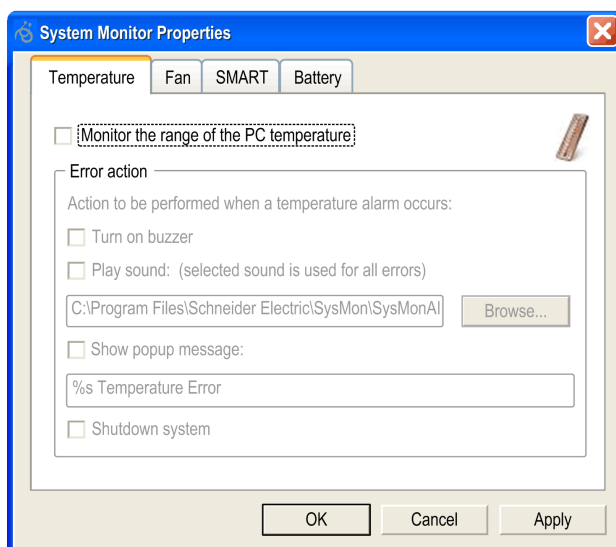
**System Monitor Properties - Fan**

The screenshot below shows the Fan parameters tab, the contents are described later *(see page 99)*:



**System Monitor Properties - Smart**

The screenshot below shows the Smart parameters tab, the contents are described later *(see page 99)*:

**System Monitor Properties - Battery (in development)**

The screenshot below shows the Battery parameters tab, the contents are described later *(see page 99)*:
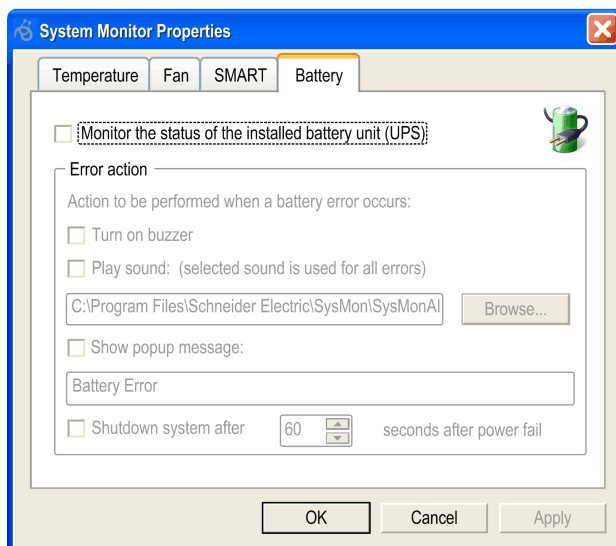


**Description**

| Field | Description |
| --- | --- |
| **Monitor the range of the PC temperature** | You must check this box to enable and begin monitoring the PC temperature. |
| **Monitor the function of the PC Fans** | You must check this box to enable and begin monitoring the Fans functioning. |
| **Monitor the function of the built-in hard disks** | You must check this box to enable and begin monitoring the hard disks functioning. |
| **Error action** | |
| **Turn on buzzer** | To enable the buzzer you must check this box . |
| **Play sound** | You must check this box to enable the sound that will be used for all detected errors. |
| **Show popup message** | When this box is checked you display status messages in the form of a popup. |
| **Shut down system** | If you want the system to stop when an error is detected, you must check this box. |

# System Monitor

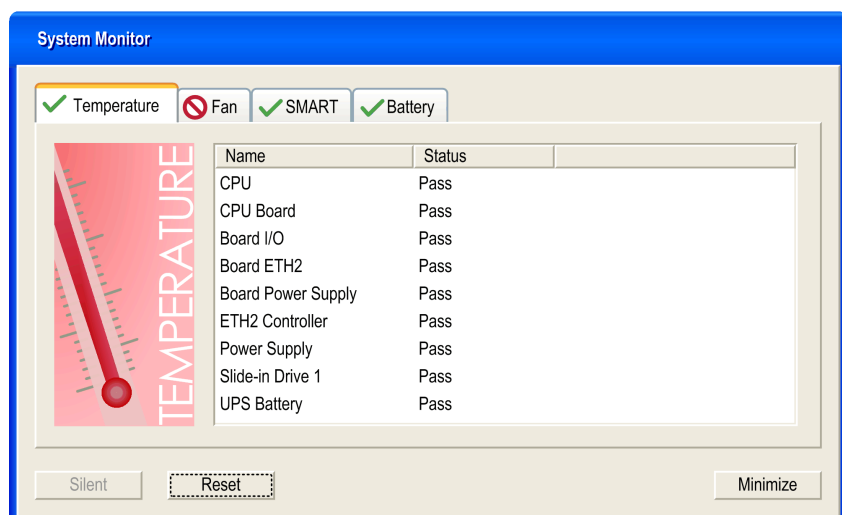<div style="text-align: right; font-size: large;">**10**</div>

## System Monitor Overview

**Presentation**

Use the following dialog tabs to display the monitoring parameters and allow you to setup the various elements that are monitored.
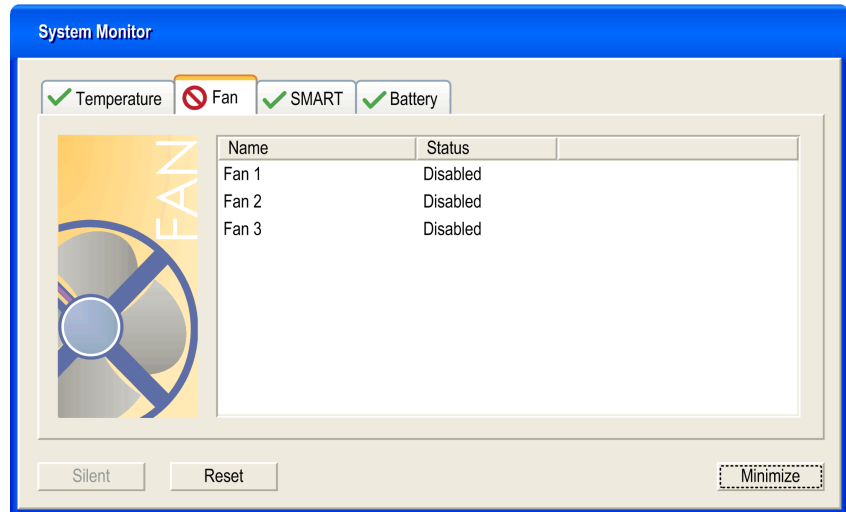
**Temperature status**

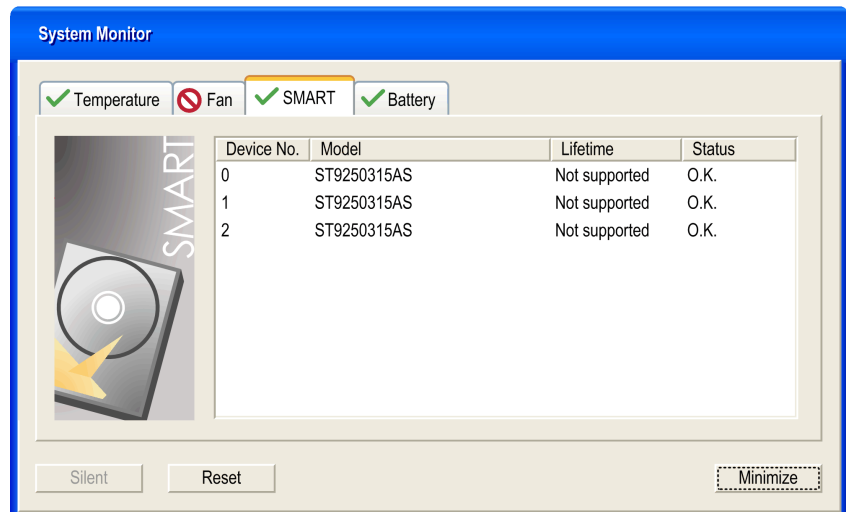The illustration below shows the displayed temperature status:

| Name | Status |
| --- | --- |
| CPU | Pass |
| CPU Board | Pass |
| Board I/O | Pass |
| Board ETH2 | Pass |
| Board Power Supply | Pass |
| ETH2 Controller | Pass |
| Power Supply | Pass |
| Slide-in Drive 1 | Pass |
| UPS Battery | Pass |

System Monitor — Tabs: Temperature, Fan, SMART, Battery. Buttons: Silent, Reset, Minimize.

**Fan status**

This parameter defines the status (Disabled or Enabled) of fans
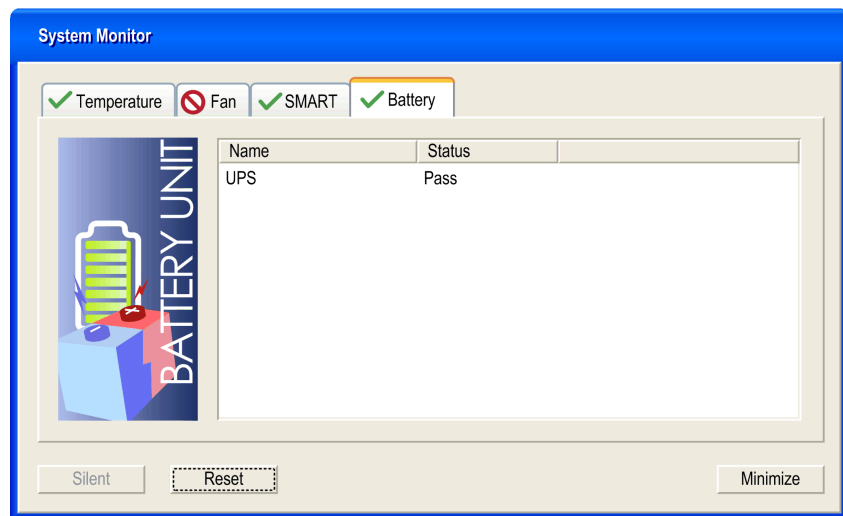


**Smart status**

This illustration below shows the hard disk monitoring

**Battery status (in development)**

The illustration below shows the battery status in the control panel

# Maintenance

# 11

**Subject of this Chapter**

This chapter covers maintenance of the PS-B unit

**What's in this Chapter?**

This chapter contains the following topics:

| Topic | Page |
|-------|------|
| Reinstallation Procedure | 106 |
| Regular Cleaning and Maintenance | 107 |

# Reinstallation Procedure

**Introduction**

In certain cases, it may be necessary to reinstall the operating system.

Precautions to be taken:

- Keep static-producing materials (plastic, upholstery, carpeting) out of the immediate work area.
- Do not remove ESD-sensitive components from their anti-static bags until you are ready to install them.
- When handling static-sensitive components, wear a properly grounded wrist strap (or equivalent).
- Avoid unnecessary contact with exposed conductors and component leads with skin or clothing.

**Reinstallation**

Refer to the relevant procedure in the included documentation "PS4000 Series Installation Guide".

## Regular Cleaning and Maintenance

<div>

# ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the PS-B unit and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the PS-B unit.

**Failure to follow these instructions will result in death or serious injury.**

</div>

<div>

# ⚠ DANGER

**EXPLOSION HAZARD**

- Always confirm the UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a PS-B unit installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect any cables or wires while the circuit is live unless the area is known to be free of ignitable concentrations of vapors, gases, and other flammable or combustible materials. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incendiary USB configuration *(see page 79)*.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

**Failure to follow these instructions will result in death or serious injury.**

</div>

<div>

# ⚠ WARNING

**RISK OF BURNING INJURY**

During operation, surface temperatures of the heat sink may reach 70°C (158°F).

Do not touch the surface of the heat sink during operation.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

</div>

**Cleaning Solutions**

# ⚠ CAUTION

**HARMFUL CLEANING SOLUTIONS**

- Do not clean the unit or any component of the unit with paint thinner, organic solvents, or strong acids.
- Use only a mild soap or detergent that will not harm the polycarbonate material of the screen.

**Failure to follow these instructions can result in injury or equipment damage.**

**Lithium Battery**

# ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Read and understand the safety information in the Regular Cleaning and Maintenance section *(see page 107)* before attempting this procedure.

**Failure to follow these instructions will result in death or serious injury.**

# ⚠ DANGER

**EXPLOSION, FIRE, OR CHEMICAL HAZARD**

Follow these instructions for the Lithium batteries:

- Do not recharge, disassemble, heat above 100 °C (212 °F), or incinerate.
- Recycle or properly dispose of used batteries.
- Replace with identical type.
- Follow all battery manufacturer's instructions

**Failure to follow these instructions will result in death or serious injury.**

The terminal contains one battery, which is used to back up system data such as the date and time.

**Replacement CMOS batteries**

The lithium battery is needed for backing up the BIOS CMOS data, the real-time clock (RTC), and SRAM data.

**Technical data**

**NOTE:** The following characteristics, features and limits only apply to this accessory and can deviate from those specified for the entire device. For the entire device where this accessory is installed, refer to the data provided specifically for the entire device.

| Features | PFXZPSBTLT1 |
|---|---|
| Capacity | 950 mAh |
| Voltage | 3 V |
| Self discharge at 23°C | < 1% per year |
| Storage time | Max. 3 years at 30°C (86°F) |

| Features | PFXZPSBTLT1 |
|---|---|
| **Environmental characteristics** | |
| Storage temperature | -20 to +60°C (-4°F to 140°F) |
| Relative humidity | 0 to 95% non-condensing |

### Maintenance and Servicing

The following describes service/maintenance work which can be carried out by a trained, qualified user.

**Changing the battery**

- The product design allows you to change the battery with the PS-B unit either on or off. In some countries, safety regulations do not allow you to change batteries while the unit is on.
- Previous settings will be restored when changing the battery with the power turned off (as the settings are stored in non-volatile EEPROM). However, the date and time must be reset bacause this data is lost when changing the battery.
- Only qualified personnel can change the battery.

### Procedure

| Step | Action |
|---|---|
| 1 | Disconnect the power supply to the PS-B unit. |
| 2 | Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body. |
| 3 | Remove the black plastic cover from the battery compartment and carefully pull out the battery using removal strips. |
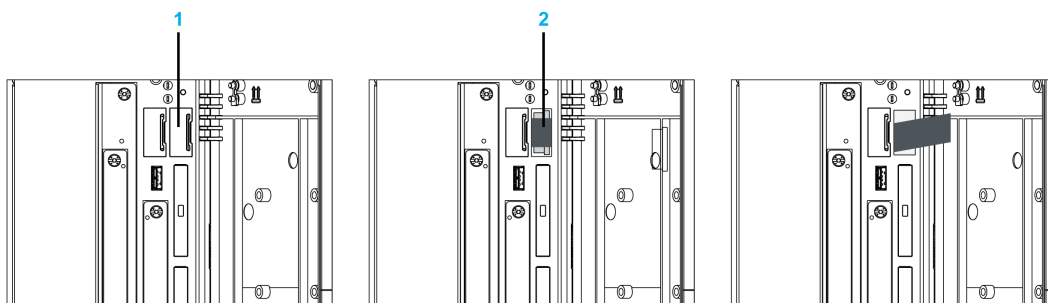


- The battery should not be held by its edges. Insulated tweezers may also be used for inserting the battery.
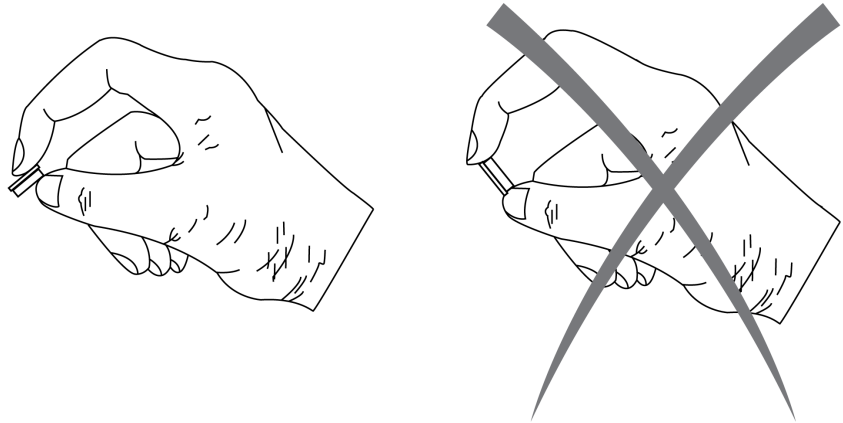
- Insert the new battery with correct polarity.
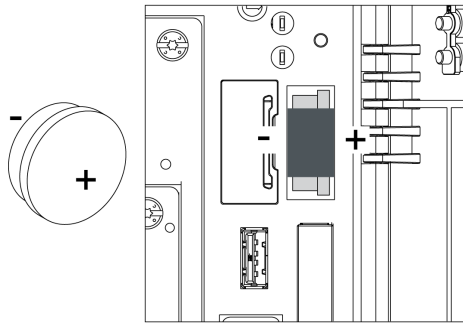


- To make the next battery change easier, be sure the removal strip is in place when inserting battery.
- Reconnect the power supply to the PS-B unit (plug in power cable and press power button).
- You may need to reset the date and time in the BIOS settings.

# Appendices

**IV**

# Accessories

# 12

## Accessories for the PS-B unit

### Available Accessories

Accessories are available as options. The list of accessories available for the PS-B unit is shown below:

| Description | Reference |
|---|---|
| CF Card, 4GB | PFXZCBCF41 |
| CF Card, 8GB | PFXZCBCF81 |
| HDD Unit without OS, 250GB (for Slide in Disk) | PFXZPSSCHDD251 |
| SSD Unit without OS, 32GB (for Slide in Disk) | PFXZPSSCSSD321 |
| Adaptor to install an unit for Slide in Disk to Slide in Slot | PFXZPSSSAD1 |
| DVD multi drive (for Slide in Slot) | PFXZPSSSMD1 |
| A cable converting DVI-I to RGB | CA7-CBLCVRGB-01 |
| Analog RGB interface cable when image signal is output to the FP from the host. (Dsub15 pin Plug) (4.5m) | FP-CV02-45 |
| Digital Visual Interface cable used to send the image signal from the host to the FP. (DVI-D 24-pin male) (5 m) | FP-DV01-50 |
| A branch cable converting DVI-I to DVI-D/RGB | CA7-CBLCVDVI-D/RGB-01 |
| USB interface cable (5m) used for touch panel data transmission between the host and the FP. The cable type is A-B. | FP-US00 |
| Extension cable attaching USB port to front panel. | CA5-USBEXT-01 |
| Serial interface cable (5m) used for touch panel data transmission between the host and the FP. This is a straight Dsub9 pin female cable. | FP61V-IS00-O |
| Maintenance Items | |
| DC power supply connector (Screw type 5pcs) | PFXZPSCNDC1 |
| Lithium battery for replacement (for BIOS backup) | PFXZPSBTLT1 |
| Replacement Fan filter for PS-B with 1 Slot (5pcs) | PFXZPB1FTFAN5P1 |
| Replacement Fan filter for PS-B with 2 Slots (5pcs) | PFXZPB2FTFAN5P1 |
| Replacement Fan filter for PS-B with 5 Slots (5pcs) | PFXZPB5FTFAN5P1 |
| Noise Filter for Marine Certification [1] | PFXZFTPNDC1 |

[1]  Only PS-4000B with CPU AtomTM and Embedded Standard 2009 ML model(PFXPB1B2BD11C04N00) having Noise Filter is certificated by GL.