IPC Series

BOX-PC
IPC-BX/M620(PCW) Series

User's Manual

CONTEC CO.,LTD.

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Table of Contents

1. Introduction

The IPC-BX/M620(PCW) is an IBM PC/AT compatible, box computer designed for industrial use based on a low-power-consumption CPU of the Ultra Low Voltage Intel(R) Celeron(R) Processor 400MHz, to operate as a completely nature-cooled (fanless) system. The box computer provides a variety of interfaces including the USB, 100BASE-TX, and RS-232C ports, capable of serving for a wide range of applications as a compact platform based on a general-purpose PC OS. As this series incorporates handpicked components such as the embedded types of CPU and chipset, it excels in environmental resistance and remains in stable supply for an extended period of time. You can therefore use the box computer under severe operating conditions such as FA with ease.

The box computer (BOX-PC series) is available in the following three models:

Base Model

IPC-BX/M620(PCW)C

Model with Expansion Slot

IPC-BX/M620(PCW)CP (Expansion Slot(PCI x 2)type)

IPC-BX/M620(PCW)C4P (Expansion Slot (PCI x 4)type)

Features

- Equipped with the Ultra Low Voltage Intel(R) Celeron(R) Processor 400MHz (FSB 100MHz) CPU and memory conforming 256MB as standard
- Fan-less operation achieved by natural air-cooling
- High reliability and completely silent running (when fitted with the silicon disk from CONTEC)
- Long, reliable supply (The CPU and chip set are embedded versions.)
- Adoption of BIOS (Phoenix Technologies, Ltd.) customized by CONTEC to support the BIOS level
- Other than the conforming PC I/F, equipped with the PCMCIA (for CardBus), Audio (AC97 conforming), 100BASE-TX and RAS I/F as a standard
- Equipped with a secondary-IDE connector to allow an optional external CD-ROM to be connected
- Capable of starting up, even with the battery dead, using CMOS data retained by EEPROM
- Front part is the ingress protection for IP65 performance

Compatible Operating Systems

- Windows 2000 Professional
- Windows NT Workstation 4.0(SP6a)
- Windows XP Embedded
- Windows NT Embedded 4.0

Customer Support

CONTEC provides the following support services for you to use CONTEC products more efficiently and comfortably. No driver software is provided with this module. Please download the latest drivers from the CONTEC web site. Documents including important notes on the use of the module are also posted on the web site. Please visit the CONTEC web site before using the module.

Web Site

Japanese http://www.contec.co.jp/
English http://www.contec.com/
Chinese http://www.contec.com.cn/

Latest product information

CONTEC provides up-to-date information on products.

CONTEC also provides product manuals and various technical documents in the PDF.

Free download

You can download updated driver software and differential files as well as sample programs available in several languages.

Note! For product information

Contact your retailer if you have any technical question about a CONTEC product or need its price, delivery time, or estimate information.

Limited One-Year Warranty

CONTEC Products are warranted by CONTEC CO., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original products. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from the CONTEC group office where you purchased before returning any product.

*No product will be accepted by CONTEC group without the RMA number.

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

Safety Precautions

Understand the following definitions and precautions to use the product safely.

Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources. Understand the meanings of these labels to operate the equipment safely.

⚠ 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, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Handling Precautions

⚠ WARNING

- Always check that the power supply is turned off before connecting or disconnecting power cables.
- Do not use the touch panel to control operations that have the potential to cause serious injury or death.
- Do not modify the product.
- Always turn off the power before inserting or removing circuit boards or cables.
- This product is not intended for use in aerospace, space, nuclear power, medical equipment, or other applications that require a very high level of reliability. Do not use the product in such applications.
- If using this product in applications where safety is critical such as in railways, automotive, or disaster prevention or security systems, please consult with your sales agent or CONTEC information service.
- Do not attempt to replace the battery as inappropriate battery replacement poses a risk of explosion.
- For battery replacement, contact your retailer as it must be performed as a process of repair.
- When disposing of a used battery, follow the disposal procedures stipulated under the relevant laws and municipal ordinances.

⚠ CAUTION

- Do not use or store the product in a location exposed to extremely high or low temperature or susceptible to rapid temperature changes.
  Example: - Exposure to direct sun
  - In the vicinity of a heat source

- Do not use the product in extremely humid or dusty locations. It is extremely dangerous to use the product with its interior penetrated by water or any other fluid or conductive dust. If the product must be used in such an environment, install it on a dust-proof control panel, for example.
- Avoid using or storing the device in locations subject to shock or vibration.
- Do not use the product in the vicinity of devices that generate strong magnetic force or noise. Such devices will cause this device to malfunction.
- Do not use or store the product in the presence of chemicals.
- The lower center of the left face (seen from the connector's front surface) may become hot. To avoid being burned, do not touch that section while the product is in operation or immediately after turning off the power. Avoid installation in a location where people may come into contact with that section.
- To clean the BOX-PC, wipe it gently with a soft cloth dampened with either water or mild detergent. Do not use chemicals or a volatile solvent, such as benzene or thinner, to prevent pealing or discoloration of the paint.
- Hard disks have a limited life span. Please perform systematic backup and maintenance.
- CONTEC does not provide any guarantee for the integrity of data on hard disks.
- To prevent corruption of files, always shutdown the OS before turning off the BOX-PC.
- 2.5 inches hard disk drive (HDD) of our company has not guaranteed use by continuation and continuation power for 24 hours. When it is used by continuation operation and continuation power a life fails extremely. In the case of a 24-hours operation system, use of our company silicon disk drive (SDD) is recommended.
- Before installing or uninstalling an expansion board (the CP model) or connecting or disconnecting a connector, be sure to unplug the power cable from the wall outlet.
- CONTEC reserves the right to refuse to service a product modified by the user.
- In the event of failure or abnormality (foul smells or excessive heat generation), unplug the power cord immediately and contact the sales representative you purchased the product from or the CONTEC Information Center.
- To connect with peripherals, use a grounded, shielded cable.
- Use an AC cable that is compatible with both the rated supply voltage and the receptacle. (The cable provided with the product is for 125VAC.)
- Component Life:

  (1) Power supply--- Estimated life is about 10 years based on continual operation at 40°C (horizontal installation). However, (higher) operating temperatures will result in shorter life.

  (2) Battery--- The internal calendar clock and CMOS RAM are backed by a Lithium primary battery. The backup time at a temperature of 25°C with the power disconnected is 10 years or more.

  * Replacement of expendables is handled as a repair (there will be a charge).
- Regarding “VCCI Class A, FCC PART 15 Class A and EMC Instruction Class A Notice”

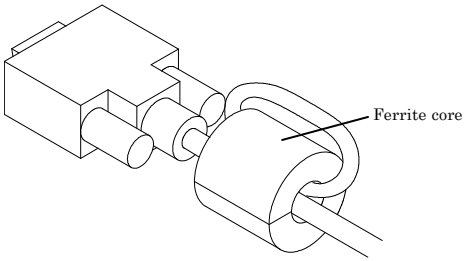
  The ferrite core must be installed in the following each cable so that this product may suit the above-mentioned standard.

  - Speaker connection cable

    Optional Ferrite Core (FRC2009A-6) or SEIWA E04SR200935A (or an equivalent product)

  Open the ferrite core case and wind the cable around it once near the connector and close it.

- Image diagram



FCC PART 15 Class A Notice

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference at his own expense.

WARNING TO USER

Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.

2. Overview

Specifications

Table 2.1. Functional Specifications ***< 1 / 2 >***

Model		IPC-BX/M620(PCW)C	IPC-BX/M620(PCW)CP	IPC-BX/M620(PCW)C4P
CPU		Ultra Low Voltage Intel(R) Celeron(R) Processor, FSB100MHz		
Chip set		Intel(R) 815E		
Memory	L2 Cache	256KB		
	Main memory	256 MB standard *1 / Max. 256MB (3.3V 144pin SO-DIMM PC100 Socket x 2)		
	BIOS ROM	128KB E0000H - FFFFFH (Phoenix)		
Video	Controller	Intel 815E (Built into the controller)		
	Video RAM	Main memory shared		
	Video BIOS	48KB (C0000H - CBFFFF)		
	Display I/F	DVI-I 29pin *2		
Audio		AC97 compliant LINE IN: ϕ3.5 Stereo mini jack Full-scale input level 1.3Vrms(Typ.) LINE OUT: ϕ3.5 Stereo mini jack Full-scale input level 1.0Vrms(Typ.) MIC UN: ϕ3.5 monaural mini jack Full-scale input level 1.3Vrms(Typ.)		
FDD I/F		Equipped with a dedicated 26pin, half-pitch connector: 2 modes (Optional FDD: PC-FDD25BH)		
IDE HDD I/F	Primary	Ultra DMA/100 2.5 inch IDE HDD or silicon disk drive: 1 internal unit (One more unit can be added. Either of the two must be a silicon disk drive.)		
	Secondary	Equipped with a dedicated 40pin, half-pitch connector (for connection of an optional CD-ROM) (right surface)		
Serial I/F		RS-232C(general-purpose): 2ch (SERIAL PORT1,2) 9pin, D-SUB connector RS-232C(touch panel): 1ch (SERIAL PORT3) [inside the DVI connector] *3 *4 RS-422/485(general-purpose): 1ch (SERIAL PORT4) [inside the RAS connector] *4		
Parallel I/F *4		Bi-directional, Centronics-compliant, 25pin D-SUB connector		
LAN	I/F	Ethernet 100BASE-TX/10BASE-T RJ-45 connector		
	Controller	Intel ICH2 integrated		
PC card slot		PCMCIA Type I, II x 2 or III x 1 (Startup from ATA card not allowed) CardBus correspondence		
USB I/F		2ch (USB 1.1)		

Table 2.1. Functional Specifications < *2 / 2* >

Model		IPC-BX/M620(PCW)C	IPC-BX/M620(PCW)CP	IPC-BX/M620(PCW)C4P
Keyboard I/F		PS/2 type keyboard -compatible (6pin MINI DIN connector)		
Mouse I/F		PS/2-type mouse-compatible (6pin MINI DIN connector)		
General-purpose I/O *4		3 opto-isolated inputs and outputs (However, one output also serves as an external WDT output and one input also serves as remote reset. They become available when switched.)		
RAS function *4		WDT: 1sec - 255sec (RESET or external output is allowed at time expiration) Remote reset: External input signal		
Expansion board slot		None	PCI/ISA shared slot x 2 *5, Installable board length : 240mm (Max.)	PCI/ISA shared slot x 2 *5, Shared PCI slot x 2, Installable board length : 240mm (Max.)
RTC/CMOS		Lithium backup battery life: 10 years or more		
Power supply	Input supply voltage	Automatically switched between 85 - 132 VAC and 170 - 265 VAC (47 - 63 Hz)		
	Current consumption	50VA (Max.)	90VA (Max.)	115VA (Max.)
	Expansion board power-supply capacity	None	+5V: 2A(1A x 2 Slot), -5V: Not supplied, +12V: 0.5A, -12V: 80mA	+5V: 4A(1A x 4 Slot), -5V: Not supplied, +12V: 0.5A, -12V: 80mA
Physical dimensions (mm)		262(W) x 262(D) x 55(H)	262(W) x 262(D) x 115(H)	262(W) x 262(D) x 180(H)
Weight		Approx. 3.3kg	Approx. 4.2kg	Approx. 5.0kg

*1 A 256 MB memory module is plugged in one socket.

*2 The interface can connect the PC to a CONTEC Panel Link input type display (using an optional cable) or an ordinary analog RGB input display (using the bundled DVI-analog RGB adapter).

*3 The interface is used for the CONTEC Panel Link or touch panel type display.

*4 Serial ports 3 and 4 can be used as general-purpose RS-232C ports by replacing the bracket(Bundled). In that case, the touch panel, RAS functions (WDT time-out output and remote reset input), RS-422/485, general-purpose inputs, and parallel interfaces are disabled.

*5 The following signals cannot be used on ISA bus slots.

-5V, IOCHK, REFRESH, MASTER

The PCI bus slots comply with the 32-bit specification. Use of combined 32/64-bit boards has not been verified.

Table 2.2. Installation Environment Requirements

Parameter			Requirement description
Power supply specifications	Allowable instantaneous		Less than 20ms
	Power outage		One minute each for 3.0 kVAC (input-output), 2.0 kVAC (input-FG), and 0.5 kVAC (output-FG)
	Dielectric strength		50MΩ (500VDC)
Ambient specifications	Operating temperature		0 - 50°C(SDD in use) 5 - 45°C(HDD in use) 5 - 45°C(FDD in use)
	Storage temperature		-10 - 60°C
	Humidity *1		10 - 90%RH(No condensation)
	Floating dust particles		Not to be excessive
	Corrosive gases		None
	Line-noise resistance	Line noise	AC line/±2kV, Signal line/±1kV (IEC1000-4-4Level 3, EN61000-4-4Level 3)
		Static electricity resistance	Contact discharge/±4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2) Atmospheric discharge/±8kV (IEC1000-4-2Level 3, EN61000-4-2Level 3)
	Vibration resistance *2	Sweep resistance	10 - 57Hz/semi-amplitude 0.15mm 57 - 150Hz/2.0G 80 min. each in x, y, and z directions (JIS C0040-compliant, IEC68-2-6-compliant)
	Impact resistance *2		10G, half-sine shock for 11 ms in x, y, and z directions (JIS C0041-compliant, IEC68-2-27-compliant)
	Grounding		Class D grounding (previous class 3 grounding)

*1 When a floppy disk is not in use.

*2 When the HDD and FDD are not in use.

System Configuration

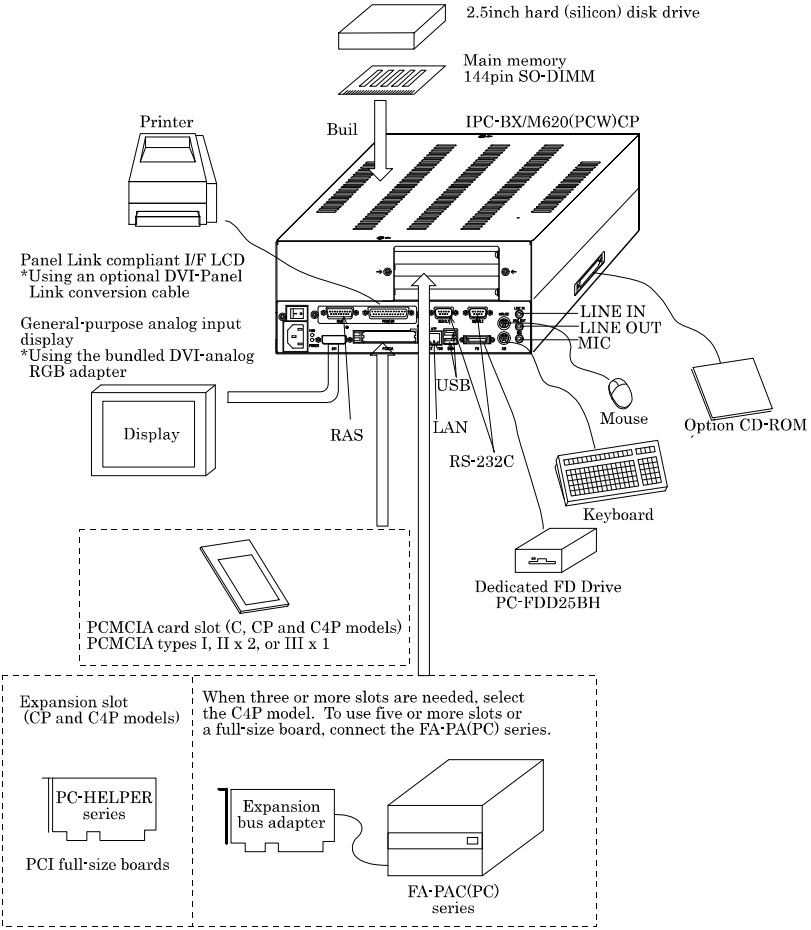


Figure 2.1. System Configuration

Physical Dimensions

IPC-BX/M620(PCW)C

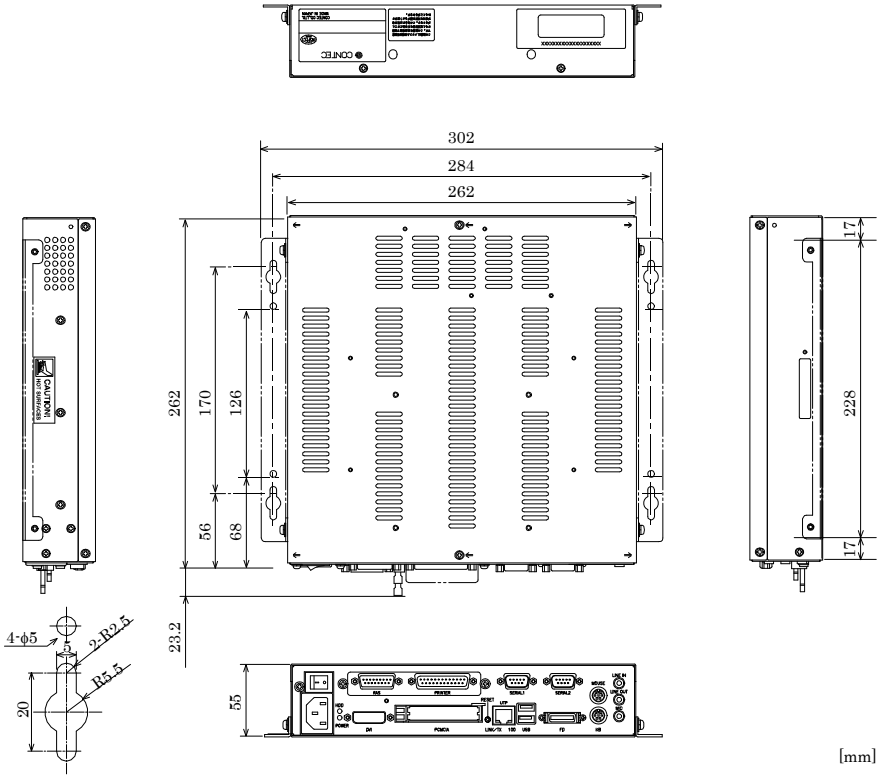


Figure 2.2. IPC-BX/M620(PCW)C

IPC-BX/M620(PCW)CP

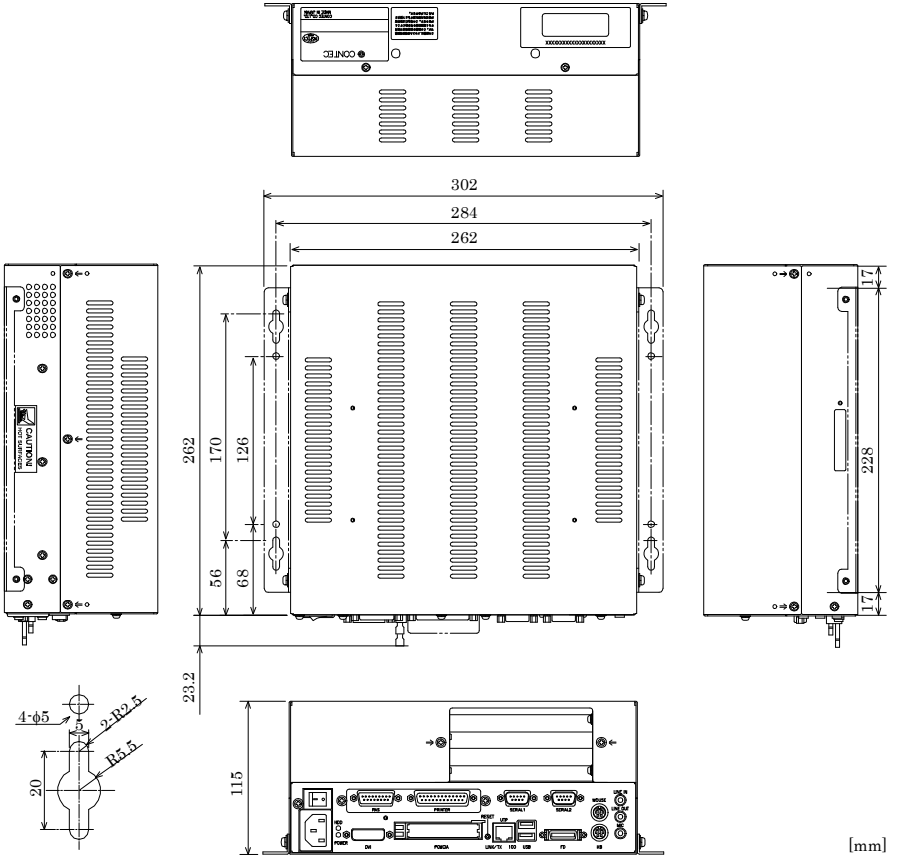


Figure 2.3. IPC-BX/M620(PCW)CP

IPC-BX/M620(PCW)C4P

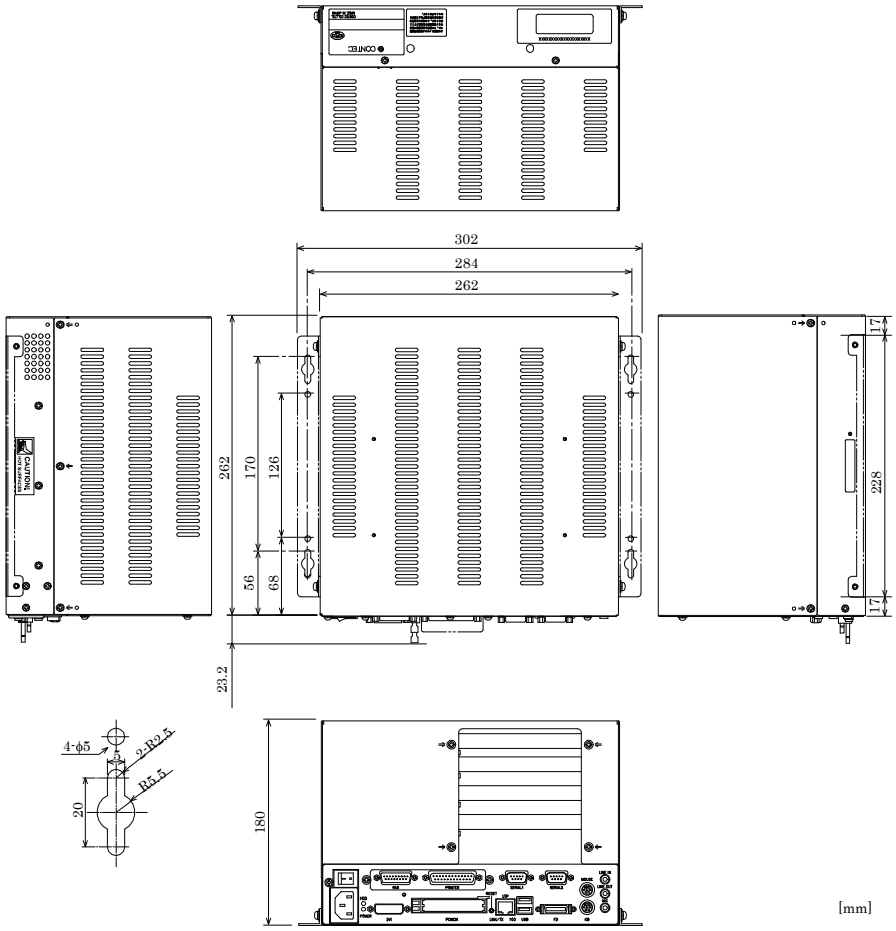


Figure 2.4. IPC-BX/M620(PCW)C4P

3. Hardware Setup

Before Using the BOX-PC for the First Time

Follow the next steps to set up the BOX-PC:

STEP1 Install the hard disk and expansion main memory (DIMM) and set jumper switches.
By referring to the information in this chapter, set the BOX-PC.

STEP2 Connect cables.
Connect necessary external devices, such as a printer and a CRT, to the BOX-PC using appropriate cables.

STEP3 Turn on the power.
After verifying that you have correctly followed steps 1 and 2, turn on the power. If you feel something is wrong after turning on the power, turn off the power immediately and check to see if the BOX-PC has been set up correctly.

STEP4 Set up BIOS.
By referring to Chapter 4, set up BIOS. This setup requires a keyboard and a display.

* Before using the BOX-PC, be sure to execute " LOAD SETUP DEFAULTS" to initialize the BIOS settings to their default values. (See Chapter 4, "Main Menu.")

⚠ CAUTION

If your BOX-PC is a Windows preinstalled model, be sure to connect the keyboard and mouse to it before turning the power on for the first time.

Hardware Setup

Removing the Top Cover and HDD Bracket

- Before you start, be sure that the power is turned off.
- Remove only those screws that are explained. Do not move any other screw.

(1) Remove the top cover.

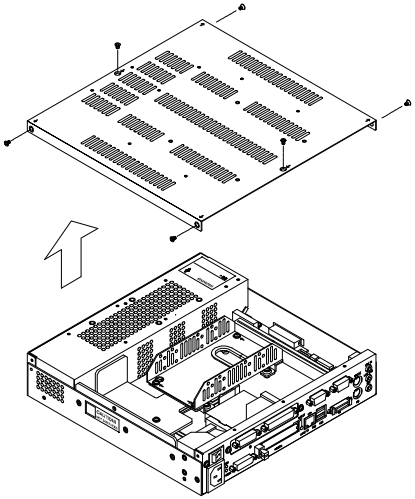


Figure 3.1. Removing the Top Cover

(2) Remove the hard disk bracket.

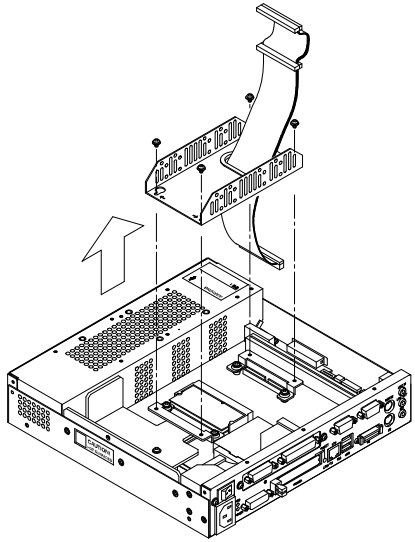


Figure 3.2. Removing the HDD Bracket

Locations and Settings of Internal Connectors and Jumpers

When you remove the top cover and hard disk bracket, the connectors, jumpers, and switches are laid out as shown in the figure below:

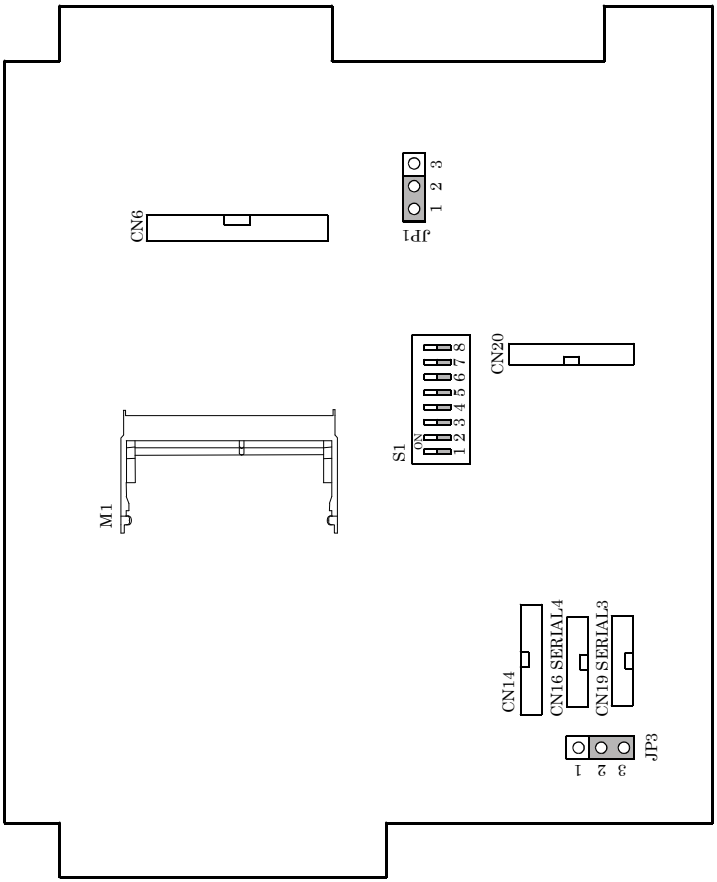


Figure 3.3. Locations and Settings of Jumpers, Connectors, and Switches inside the Top Cover

Table 3.1. Jumper List

No.	Function	Factory setting	Reference Page	Remarks
JP1	Clear CMOS.	1 - 2 shorted	----	Short 2 - 3 to clear CMOS
JP3	Sets RS-485 termination	2 - 3 shorted	47	
S1	Select the use of serial ports C and D.	1 - 8 OFF	70	

Table 3.2. Internal Connector List

Name	Function	Reference page
CN6	Primary IDE connector (44pin, pin header)	71
M1	Expansion memory set (3.3V, 144pin SO-DIMM)	20
CN20	Printer Connector	60
CN14	RAS Connector	61
CN16	SERIAL4 Connector	45
CN19	SERIAL3 Connector	45

Installing the Hard Disk

(1) Connect the provided HDD cable to the hard disk (silicon disk).

⚠ CAUTION

Connect the HDD cable in alignment with pins from the left end of the connector on the HDD side. Four master/slave setting pins are left unconnected on the right side. Be aware that connecting the power with the connector misaligned will damage the cable.

(2) By threading the cable through the hole on the base of the hard disk bracket, fasten the disk to its bracket using four screws.
- Fasten the disk using the outer or inner hole depending on the model you are using. (The figure below shows an example that uses the inner screw hole.)

⚠ CAUTION

When installing two drives in the HDD bracket, you can place either the hard disk drive (HDD) or silicon disk drive (SDD) in the upper position and only the SDD in the lower position. If you install two disk drives, set their jumpers according to the instructions in their manuals to assign them as the master and slave devices.

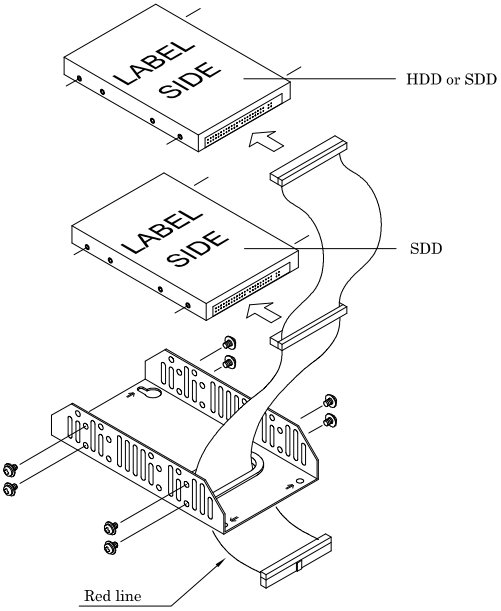


Figure 3.4. Installing the Hard Disk

(3) Connect the HDD cable to CN6 on the unit and fasten the hard disk bracket to the unit using four screws.

(4) Close the top cover and secure it with screws.

Installing the Main Memory (DIMM)

Compatible DIMM Types

Obtain the following special option products.

- Package type : 144pin Small Outline DIMM
- Specifications : 3.3V, PC133/CL3
- Capacity : 256MB
- Type : SDRAM
- Optional memories * : PC-MSD256-144V

- Package type : 144pin Small Outline DIMM
- Specifications : 3.3V, PC100/CL2
- Capacity : 128MB
- Type : SDRAM
- Optional memories * : PC-MSD128-144H

* Operation is not guaranteed if memory parts other than CONTEC option products are used.

Main Memory (DIMM) Installation Procedure

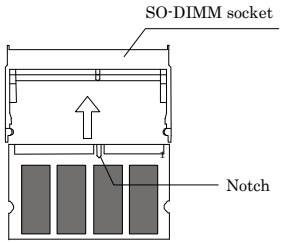
The mounted SO-DIMM sockets vary depending on the type of the circuit board used.

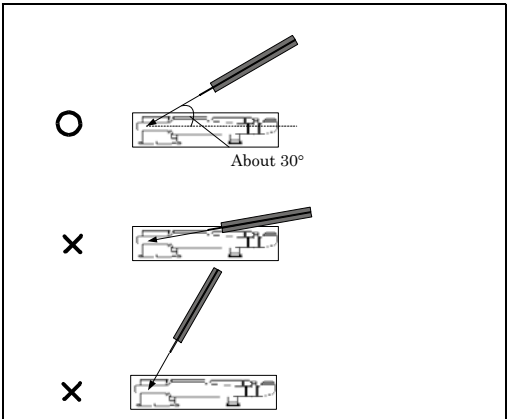
<Board type with single sockets on its front and back>

This type of circuit board has single sockets on its front and back. The socket on the back is equipped with standard memory. To add more memory, install it to the socket on the front of the board.

Follow the next steps to fit the memory into the SO-DIMM socket:

(1) Insert the DIMM into its socket with the notch positioned on the right side. (See the note.)





(Note) Insert SO-DIMMs at an angle of about 30 degrees.
An attempt to insert them at inappropriate angles as marked with X above may break the SO-DIMM sockets.

(2) Press in the direction indicated by the arrow. You hear a click as the memory fits into the socket.

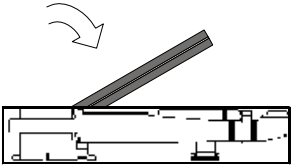


Figure 3.5. Installing the SO DIMM

<Board type with a double socket on its front>

This product has a double socket on the front of its circuit board. Standard memory is installed in the lower socket. To add more memory, install it to the upper socket.

SO-DIMM Disconnection Procedure

Open the levers on both sides slightly to the left and right. You should be able to remove the DIMM.

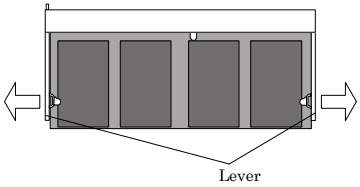


Figure 3.6. Uninstalling the SO-DIMM

⚠ CAUTION

The SO DIMM socket plugging/unplugging life is 30 times. The operation of an SO DIMM socket is not guaranteed once an SO DIMM has been plugged and unplugged more than 30 times.

Fastening the Power Cable

Removing the Screw on the Metal Brace to Keep the AC Cord in Place

In order to install the metal brace, temporarily remove the machine screw on the front left end.

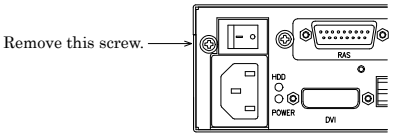


Figure 3.7. Removing the Screw

Installing the AC Cord Metal Brace and the Clamp

Insert the AC cord all the way into the inlet. Fasten the AC cord metal brace using the screw you removed earlier. Attach the clamp to an appropriate location on the metal brace to clamp the cord. The “AC cord metal brace” is attached to the main case.

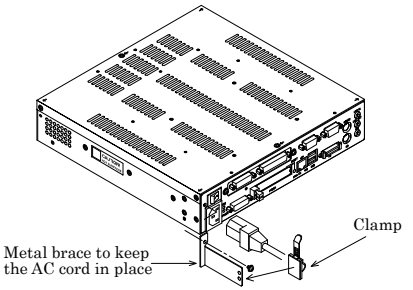


Figure 3.8. Installing the AC Cord Metal Brace and the Clamp

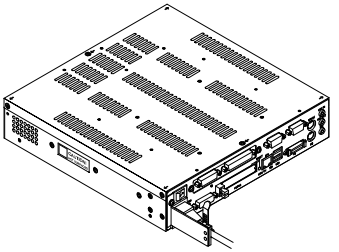


Figure 3.9. Installing the Metal Brace and the Clamp

Installing the SERIAL 3, 4 Bracket

To use the serial ports for SERIAL 3 and 4 in place of RAS and PRINTER, replace the bracket as follows:

(1) Be sure the power is turned off.

(2) Remove the top cover.

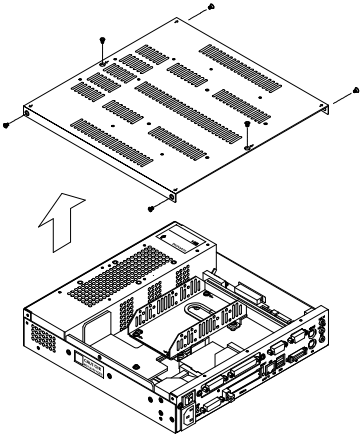


Figure 3.10. Removing the Top Cover

(3) (3) Remove the RAS-PRINTER bracket.
Remove the two screws from the interface side, unplug the cables, then remove the bracket.

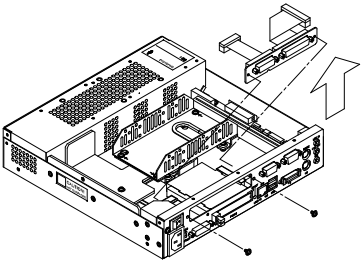


Figure 3.11. Removing the Bracket

(4) Attach the SERIAL 3/4 bracket.
Tighten the two screws on the interface side to fasten the bracket.

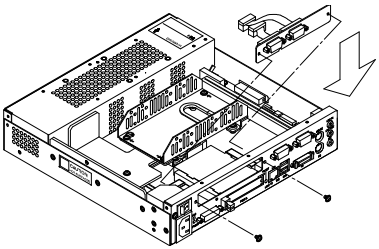


Figure 3.12. Installing the Bracket

(5) Plug the SERIAL 3 and 4 cable connectors into CN16 (SERIAL4) and CN19 (SERIAL3) as illustrated below, respectively.

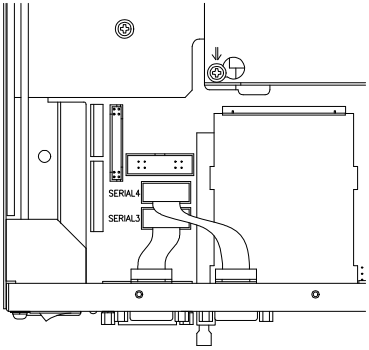


Figure 3.13. Installing the Cable connector

(6) Set bits 5 and 6 in the S1 jumper to ON.

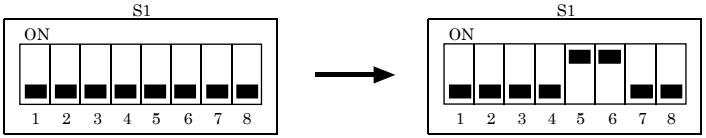


Figure 3.14. Setting the S1 Jumper

(7) Replace the top cover.

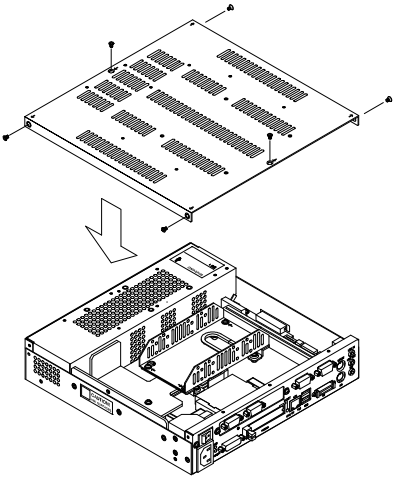


Figure 3.15. Replacing the Top Cover

Installation Requirements

The BOX-PC can be installed in any orientation (1) - (3). Avoid orientation (4) - (6) since it might not adequately dissipate heat. Similarly, to maintain the ambient temperature within the range specified in the specifications, ensure a clearance between the unit and surrounding equipment of at least 100mm for the top and rear and 50mm for the bottom and sides.

Installation Orientation

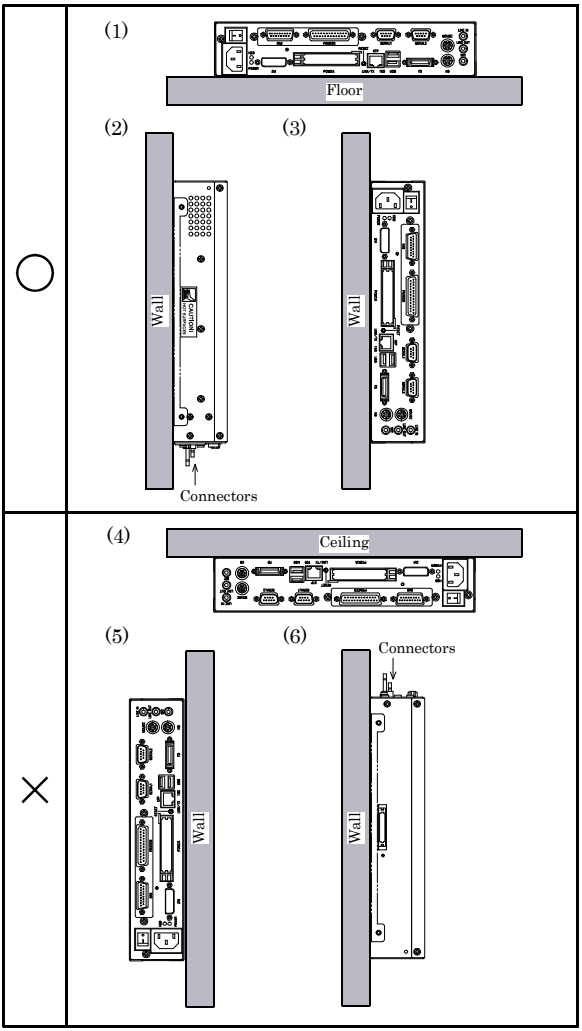


Figure 3.16. Installation Orientation

Distances between the BOX-PC and Its Vicinity

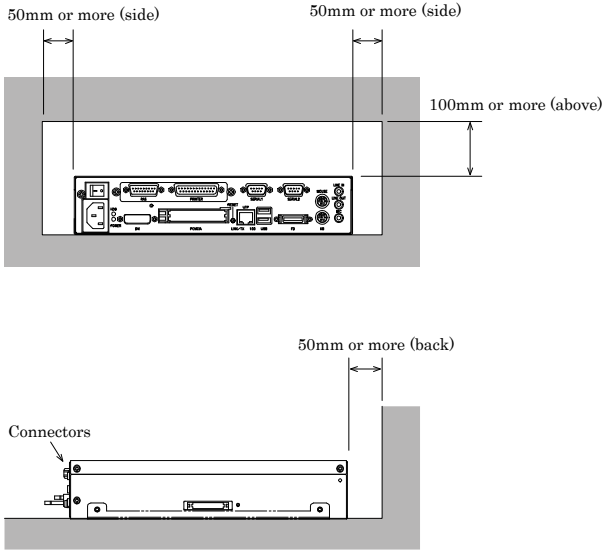


Figure 3.17. Distances between the BOX-PC and Its Vicinity

4. BIOS Setup

BIOS Setup

BIOS setup sets various settings during startup. When using the system for the first time, be sure to run BIOS setup. Once set up, the specified details will be backed up.

Starting the Setup Screen

When you turn on the system power supply, the BOX-PC displays the following initial screen as long as the system is normal. Press the <F2> key at the keyboard.

```
Phoenix BIOS 4.0 Release 6.0
Copyright 1985-2001 Phoenix Technologies Ltd.
All Rights Reserved

Copyright 2001, CONTEC CO., Ltd.
IPC-BX/M630(PCW), IPC-Px/x630(PCW) series BIOS Ver. x.xx.
CPU = Pentium III(R) Tualatin 512K-LP(133MHz/1.150) processor 800MHz
Memory Speed = PC133
635K System RAM Passed
509M Extended RAM Passed
512K Cache SRAM Passed
System BIOS Shadowed
Video BIOS shadowed
```

Figure 4.1. Initial Screen

Keystrokes

The following is a list of major key functions you can use during BIOS setup:

Table 4.1. Key Function List

Key to press	Function
→, ←	Moves the main menu.
↑, ↓	Moves between items to be set.
<Tab>	Moves within items to be set.
<Shift>+<Tab>	Moves in the direction opposite to <Tab>.
<Spacebar>	Changes details to be set.
+	Functions the same as <Spacebar>.
-	Changes in the direction opposite to the + key.
<Enter>	Opens submenus.
<Esc>	Moves to the Exit window.
<F9>	Resets all to defaults.
<F10>	Saves set values and exits setup.

Main Menu

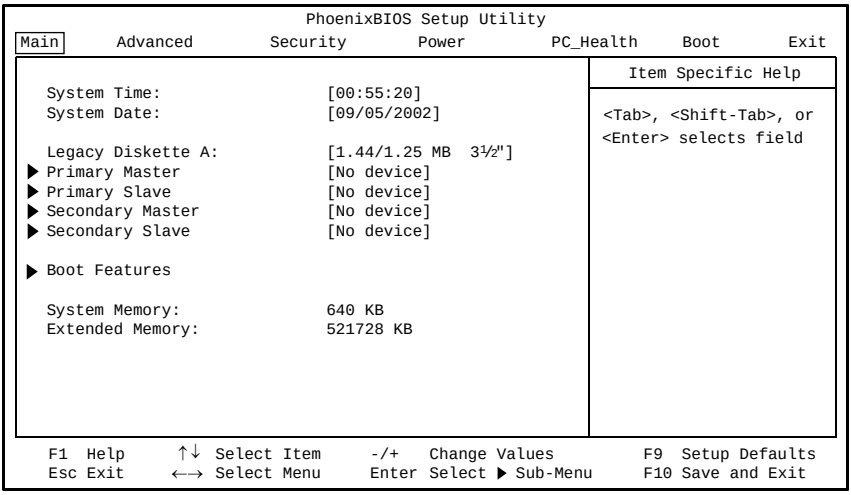


Figure 4.2. Main Window (Factory Settings)

System Time : Sets the time on the equipment calendar clock.

System date : Sets the date on the equipment calendar clock.

Legacy Diskette A : Specify the type of FDD to be used as drive A. If you are not using the FDD, set to "Disabled." Select: Disabled / 360K, 5.25in. / 1.2M, 5.25in. / 720K, 3.5in. /1.44M, 3.5in / 2.88M, 3.5in.

Primary Master : Set the type of HDD(SDD) to be used as the first drive. Selecting this field changes the screen to the submenu for manually setting drive configuration data such as the number of cylinders. This field is set to [Auto] by default. You can leave it intact for normal use.

Primary Slave : Set the type of HDD(SDD) to be used as the second drive. Selecting this field changes the screen to the submenu for manually setting drive configuration data such as the number of cylinders. This field is set to [Auto] by default. You can leave it intact for normal use.

Secondary Master : Normally, connection is not allowed. Set this field if you have connected a CD-ROM drive to the secondary IDE connector.

Secondary Slave : Connection not allowed. Set to "None."

Boot Features : This field launches the Boot Features submenu to enable or disable the options for checking the floppy disk drive and keyboard upon system boot. (See Boot Features Windows.)

System Memory : Displays the detected amount of memory installed on the system.

Extended Memory : Displays the detected amount of memory installed on the system.

Boot Features Window

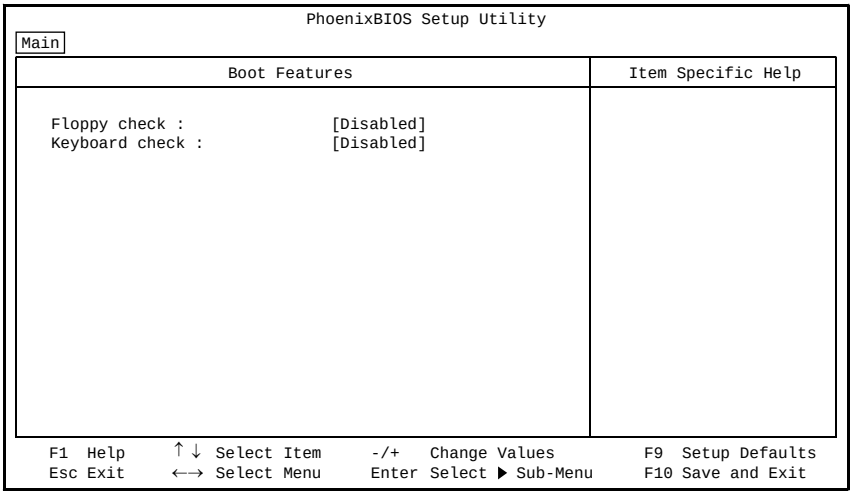


Figure 4.3. Boot Features Window (Factory Settings)

Floppy check : Select whether to seek the FDD for a connection check during system boot-up. If no FDD has been connected with this field set to [Enabled], the BIOS suspends system boot-up with an error message displayed.

Keyboard check : Select whether to seek the FDD for a connection check during system boot-up. If no FDD has been connected with this field set to [Enabled], the BIOS suspends system boot-up with an error message displayed. Connect the keyboard, then recycle the power supply.

Advanced Window

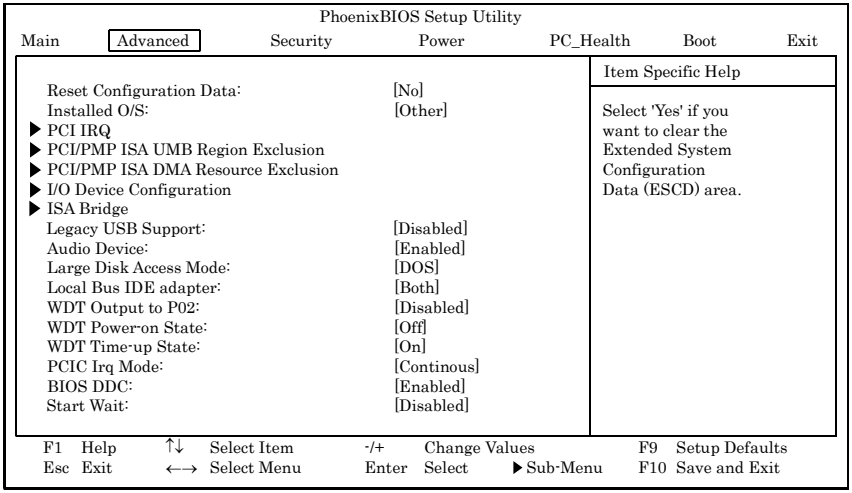


Figure 4.4. Advanced Window (Factory Settings)

Reset Configuration Data : Resets the system configuration data stored in BIOS ROM. The data will be reset by setting this field to [Yes] and exiting BIOS Setup while saving the changes you made. This field reverts to [No] automatically the next time you invoke BIOS Setup. Before reinstalling the OS, be sure to set the field to [Yes].

Installed OS : Normally, set to "Other."

PCI IRQ : Displays the PCI IRQ setup submenu. You can assign IRQs to individual PCI slots. All PCI slots are connected to IRQ10 by default.

PCI/PNP ISA UMB Region Exclusion

: Start PCI/PNP ISA UMB Region Exclusion as shown above.
You can reserve UMB areas for devices. All UMB areas are unallocated by default. Up to 32 kilobytes from addresses D0000 - D7FFFH can be allocated.

PCI/PNP ISA DMA Resource Exclusion

: Start PCI/PNP ISA DMA Resource Exclusion as shown above.
You can reserve DMA channels for devices. All UMB areas are unallocated by default.

I/O Device Configuration : Start I/O Device Configuration as shown above. You can configure serial and parallel ports. (See I/O Device Configuration Window.)

ISA Bridge	:	Sets up ISA bus expansion slots.
Legacy USB Support	:	Emulates the USB keyboard, mouse, and FDD as legacy devices. Set this field to [Enabled] before installing the OS using the USB keyboard. Once the OS gets up and running, the keyboard is controlled by the OS's driver and this field need not be set to [Enabled]. Leave the field set to [Disabled] for normal use.
Audio Device	:	Enable or disable the AC97 device.
Large Disk Access Mode	:	Normally, set to " DOS."
Local Bus IDE adapter	:	Specify whether to enable or disable IDE device.
PCMCIA ATA DISK	:	Setting for the ATA CARD booting. Use it the [Disabled] in the default.
WDT Output to PO2	:	Set the watchdog timer output to PO2.
WDT Power-on State	:	With the watchdog timer output to PO2 enabled, set the output status in the power-on state.
WDT Time-up State	:	With the watchdog timer output to PO2 enabled, set the output status in the Time-up state.
PCIC Irq Mode	:	Set to " Continous ".
BIOS DDC	:	Specify whether to enable or disable DDC. Please set to [Enabled].
Start Wait	:	Sets the wait time for the startup of BIOS and enables timing adjustment for devices connected to the main unit. [Disabled], [5sec], [10sec], [15sec], [20sec], [25sec], or [30sec] can be selected. When [Disabled] is selected, there is no wait time. (It means the same as "0sec".) Select [Disabled] under normal conditions, which is the default setting.

I/O Device Configuration Window

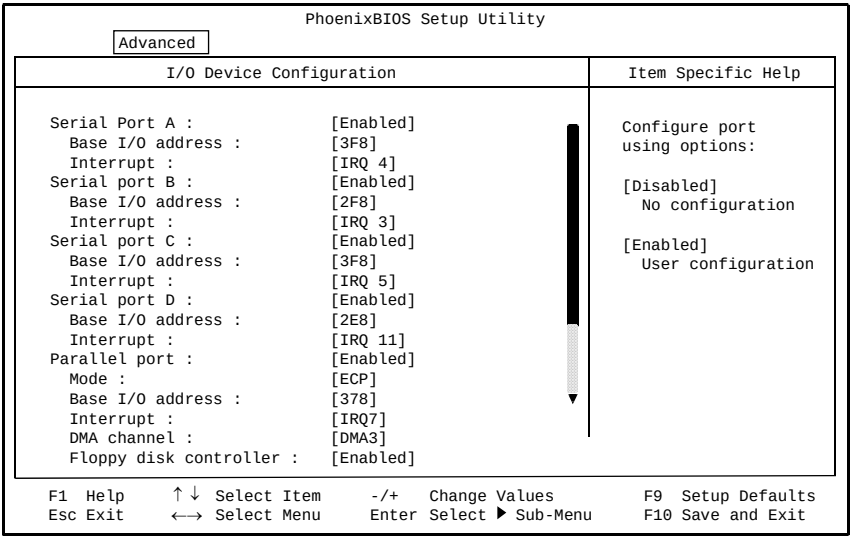


Figure 4.5. I/O Device Configuration Window (Factory Settings)

Serial port A : This setting is for SERIAL1 on the equipment connector plane.

Serial port B : This setting is for SERIAL2 on the equipment connector plane.

Serial port C : This setting is for serial communication of the touch panel port or for SERIAL3 on the equipment connector plane.

Serial port D : This setting is for RS-422/485 in the RAS connector on the equipment connector plane or for SERIAL4 on the equipment connector plane.

Parallel port : This setting is for PRINTER on the equipment connector plane.

Fields available with Parallel port set to [Enabled]

Base I/O address : Set to base I/O address.

Interrupt : Set to IRQ.

Mode : Set to parallel port's operating mode.

DMA channel : This is the DMA channel setting used when ECP is selected during parallel-port mode setting.

Floppy disk controller : Enable or disable the on-board floppy disk controller. Normally, set to default.

PCMCIA interrupt : Used to set the interrupt used by the PCMCIA controller.
The default is IRQ10.
Change this in cases such as when an ISA board uses IRQ10.

ISA Bridge Window

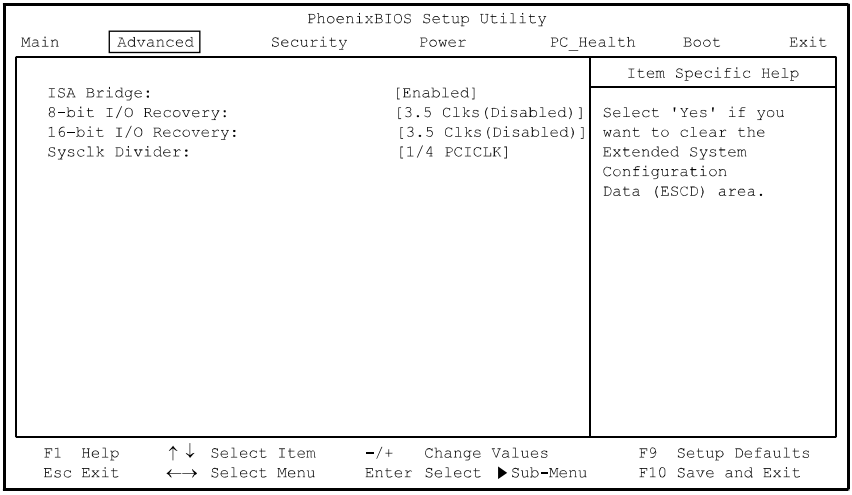


Figure 4.6. ISA Bridge Window (Factory Settings)

ISA Bridge : Used to enable or disable the ISA bus expansion slots. As the default setting is "Enable", set to "Disable" if not using the ISA bus.

8-bit I/O Recovery : Set the speed for 8-bit I/O on ISA bus boards.
The default is 3.5Clks. You should normally leave the default setting.

16-bit I/O Recovery : Set the speed for 16-bit I/O on ISA bus boards.
The default is 3.5Clks. You should normally leave the default setting.

Sysclk Divider : Select the ISA bus clock.
The default is 1/4 PCICLK (33MHz/4 = 8.25MHz).
You should normally leave the default setting.

Security Window

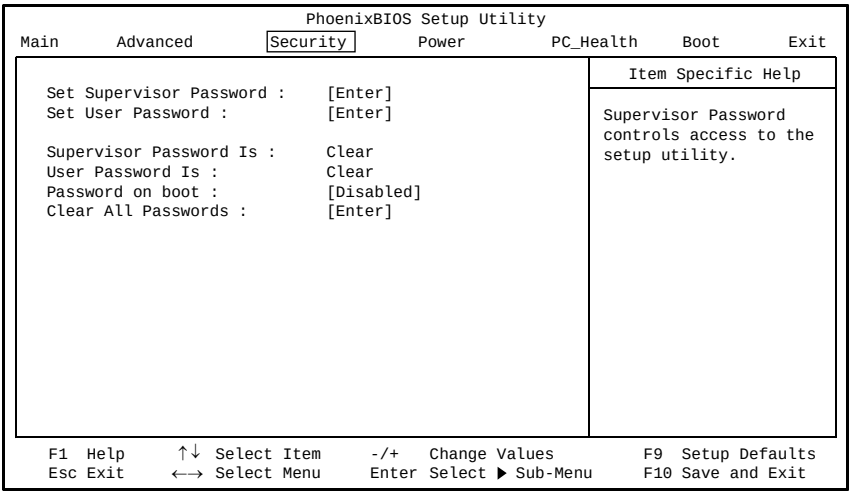


Figure 4.7. Security Window (Factory Settings)

Set Supervisor Password : Specify whether or not to require a password during setup. If a password is set, "Supervisor Password is" is enabled. Supervisor mode allows all settings to be set.

Set User Password : Specify whether or not to require a password during setup. If a password is set, "User Password is" is enabled. User mode allows only the date and time to be set.

Password on boot : Specify whether or not to require a password when booting.

Clear All Password : Both passwords can be erased by Supervisor.

⚠ CAUTION

Once a password is registered, even the password function itself cannot be cancelled without the password. Passwords should be handled with great care.

Power Window

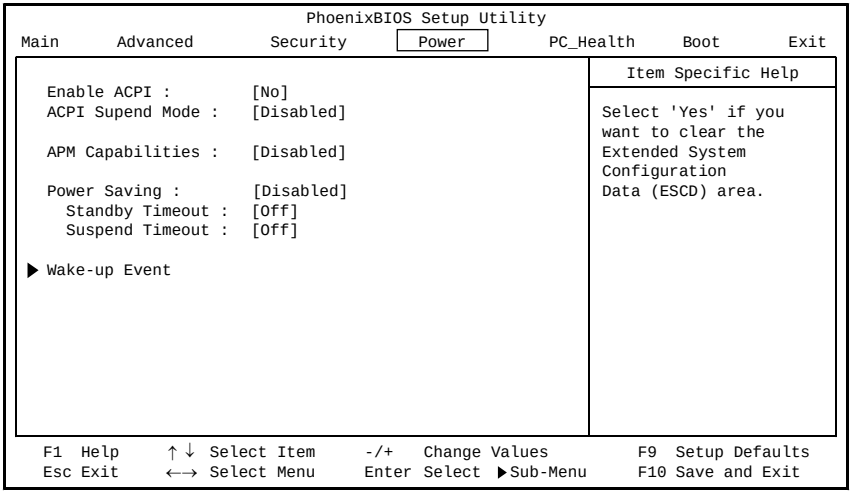


Figure 4.8. Power Window (Factory Settings)

Enabled ACPI : Set to "No".

ACPI Suspend Mode : Set to "Disabled".

APM Capabilities : Set to "Disabled".

Power Savings : Specify whether or no to use power-saving mode. Choose from "Disabled", "Customize," "Maximum Power Savings," and " Maximum Performance."

Standby Timeout : Specify the length of time from the idle state through entry into standby mode. Standby mode turns off the power to peripherals including the screen.

Suspend Timeout : Specify the time of transition from standby mode to suspend mode.

Wake-up Event : Start Wake-up Event as shown above. You can specify the wake-up event that resumes the system from the BIOS-based standby state. In principle, leave this field at the default for normal use.

PC-Health Window

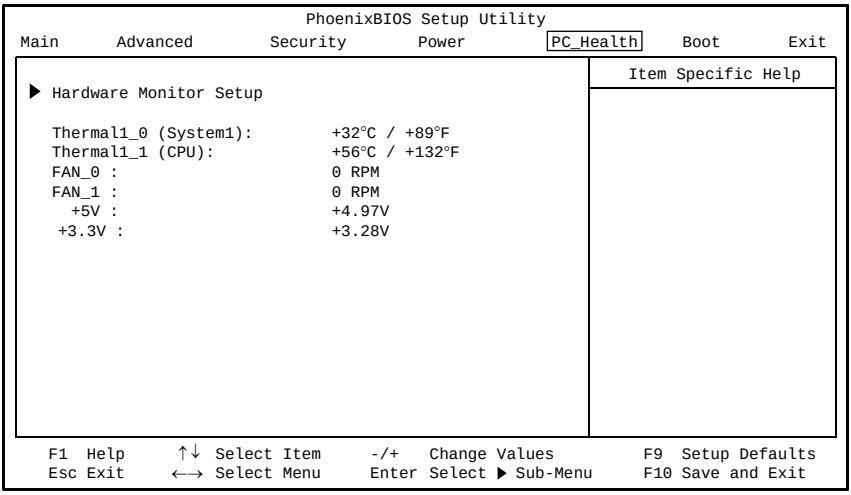


Figure 4.9. PC-Health Window (Factory Settings)

Hardware Monitor Setup	:	Start Hardware Monitor Setup as shown above. Although you can make fan settings, leave this field at the default because the BOX-PC uses no CPU fan.
Thermal_0 (System1)	:	Displays the temperature detected by the Thermal_0 temperature sensor.
Thermal_1 (CPU)	:	Displays the temperature detected by the CPU temperature sensor.
FAN_0	:	Reads “0 RPM” as this BOX-PC uses no Fan 0.
FAN_1	:	Reads “0 RPM” as this BOX-PC uses no Fan 0.
+5V	:	Displays a voltage of +5 V.
+3.3V	:	Displays a voltage of +3.3 V.

Boot Window

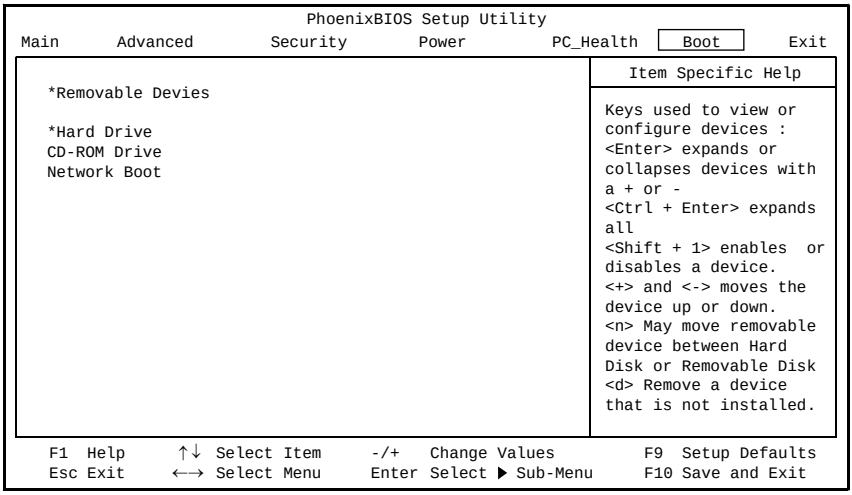


Figure 4.10. Boot Window

Specify the order in which the system to be booted is checked. Using the <+> or <-> key, rearrange the selected items.

The following devices can be specified as boot devices:

Removable Devices	:	Removable devices such as the floppy disk.
Hard Drive	:	Devices that is not removable, such as the hard disk drive and silicon disk drive.
CD-ROM Drive	:	Optional CD-ROM drive (IDE connection)
Network Boot	:	This item is not available.

The items are displayed on the menu in priority order.

Exit Window

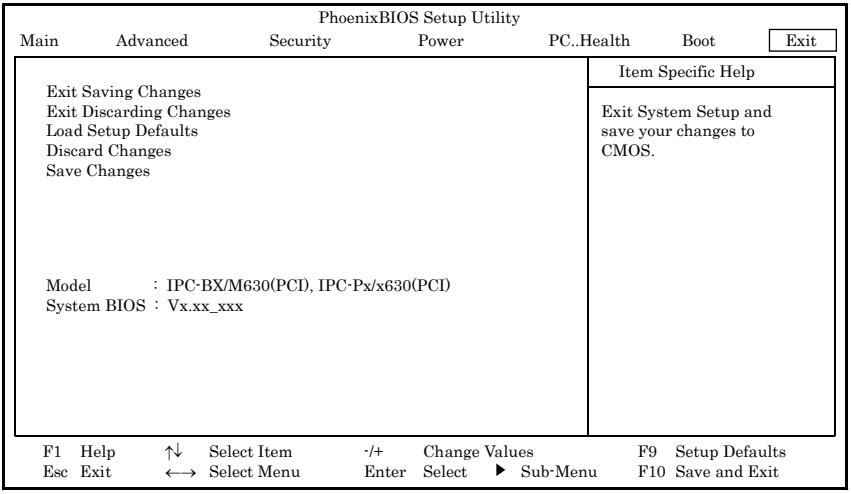


Figure 4.11. Exit Window

Exit Saving Changes : Saves values that have been modified on the setup screen in CMOS (EEPROM) and restarts the system.

Exit Discarding Changes : Restarts the system using the previous values without saving modified values in CMOS (EEPROM).

Load Setup Defaults : Sets default values that are in the possession of BIOS.

Discard Changes : Loads values that are currently in the possession of CMOS(EEPROM).

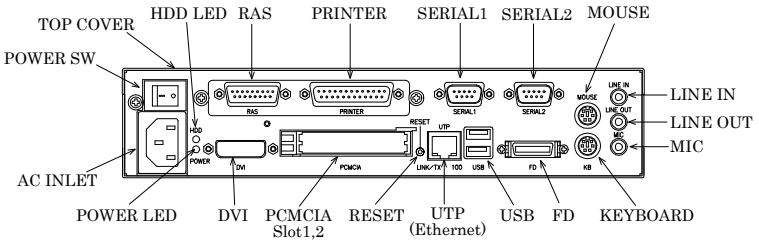
Save Changes : Saves values that have been modified on the setup screen in CMOS (EEPROM).

"Model" indicates the model type, while "System BIOS" refers to the BIOS version. These two items are used for confirmation purposes; therefore they shall not be set.

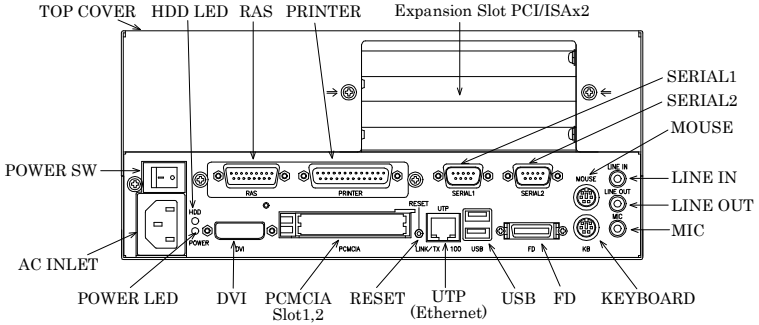
5. Each Component Function

Component Identification

IPC-BX/M620(PCW)C



IPC-BX/M620(PCW)CP



IPC-BX/M620(PCW)C4P

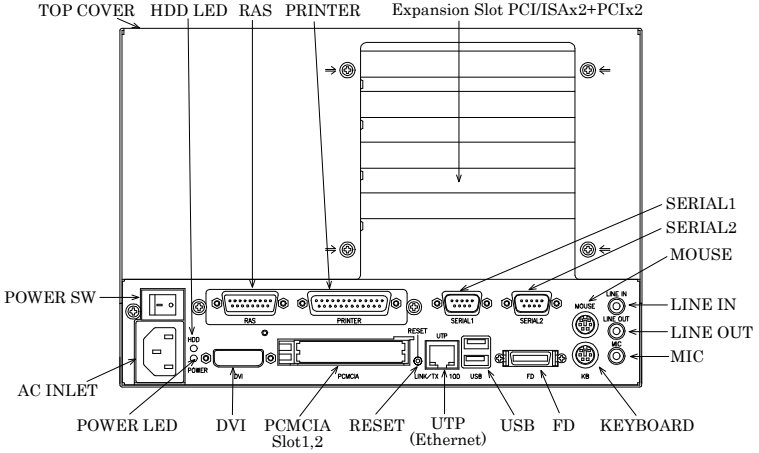


Figure 5.1. Component Identification ***< 1 / 2 >***

Side view

IPC-BX/M620(PCW)C **IPC-BX/M620(PCW)CP, C4P**

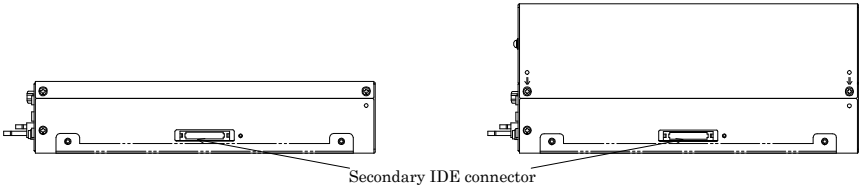


Figure 5.1. Component Identification < *2 / 2* >

Table 5.1. Component Functions

Component	Function
LINE IN	Line in (ϕ3.5 PHONE JACK)
LINE OUT	Line out (ϕ3.5 PHONE JACK)
MIC	Microphone input (ϕ3.5 PHONE JACK)
KB	Keyboard connector (MINI-DIN, 6pin)
MOUSE	PS/2 mouse connector (MINI-DIN, 6pin)
SERIAL1	Serial port 1 connector (9pin, male D-SUB)
SERIAL2	Serial port 2 connector (9pin, male D-SUB)
FD	Floppy disk drive connector (26pin, half-pitch connector)
USB	USB port connector
UTP	Ethernet connector (RJ-45)
PCMCIA	PCMCIA card slot <C, CP and C4P models>
DVI	DVI connector (29pin, DVI-I)
PRINTER *1	Parallel port connector (25pin, female D-SUB)
RAS *1	RAS function and RS-485 connector (15pin, female D-SUB)
SERIAL3 *1	Serial port 3 connector (9pin, male D-SUB)
SERIAL4 *1	Serial port 4 connector (9pin, male D-SUB)
RESET	Hard reset push button
Expansion Slot	PCI/ISA x 2 <CP model >, PCI/ISA x 2 + PCI x 2 <C4P model >
POWER	Power ON indicator
HDD	Internal hard disk access lamp
POWER SW	Power switch
AC INLET	AC power supply input connector
SECONDARY IDE	Secondary IDE connector (dedicated 40pin half-pitch connector)

*1 The two ports can be used as the PRINTER/RAS or SERIAL3 /4 ports using the bundled dedicated bracket.
(factory settings: PRINTER, RAS)

Line in Interface

A line input connector is provided, named LINE IN (3.5-mm stereo mini jack). You can connect the audio output, for example, of a CD player to this connector to record data from the CD or to play it through LINE OUT.

Line out Interface

A line output connector is provided, named LINE OUT (3.5-mm stereo mini jack). You can plug a headphone or amplifier-integrated speakers into this connector.

MIC input Interface

A MIC input connector is provided, named MIC (3.5-mm stereo mini jack). You can plug a microphone to this connector for sound input.

Audio driver

The audio driver is required to use the line input, line output, and microphone input interfaces.

Visit the CONTEC web site to download the audio driver (IPC-SLIB-01) for the OS running on your BOX-PC.

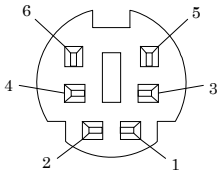
For the download, see Chapter 7 “List of Options".

Keyboard Interface

The BOX-PC is equipped with a keyboard connector named KB (MINI-DIN 6P).

Table 5.2. Keyboard Connector

Connector type	Equivalent to the MD-DS12300-14S-14 (JST)



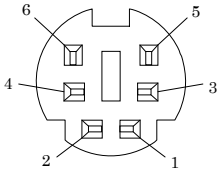
Pin No.	Signal	Pin No.	Signal
1	+KBD DATA	5	+KBD CLK
2	N.C.	6	N.C.
3	GND	SHIELD	GND
4	+5.0V DC	---	

Mouse Interface

The BOX-PC is equipped with a mouse connector named MOUSE (MINI-DIN 6P).

Table 5.3. Mouse Connector

Connector type	Equivalent to the MD-DS12300-14S-14 (JST)



Pin No.	Signal	Pin No.	Signal
1	+MOUSE DATA	5	+MOUSE CLK
2	N.C.	6	N.C.
3	GND	SHIELD	GND
4	+5.0V DC	---	

Serial Port Interface

Serial port A and B(RS-232C Ports)

The BOX-PC is equipped with two RS-232C-compliant serial port connectors (SERIAL1: Serial port A and SERIAL2: Serial port B). You can use BIOS Setup (described in Chapter 3) to configure an I/O address, interrupt and unused state for each of the ports independently. (The same I/O address and IRQ cannot be shared with any other device.)

Table 5.4. SERIAL A and B I/O Addresses and Interrupts

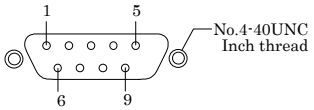
COM	I/O address	Interrupt
1	3F8h - 3FFh	IRQ 3 IRQ 4
2	2F8h - 2FFh	
3	3E8h - 3EFh	
4	2E8h - 2EFh	

The BIOS defaults to the following factory settings:

```
Serial port A : COM1(3F8h - 3FFh),IRQ4
Serial port B : COM2(2F8h - 2FFh),IRQ3
```

Table 5.5. Serial Port Connector

Connector used on the unit	9-socket D-SUB (MALE)



Pin No.	Signal	Meaning	Direction
1	CD	Carrier detect	Input
2	RD	Received data	Input
3	TD	Transmitted data	Output
4	DTR	Data terminal ready	Output
5	GND	Signal ground	-----
6	DSR	Data set ready	Input
7	RTS	Request to send	Output
8	CTS	Clear to send	Input
9	RI	Ring indicator	Input

Serial port C(touch panel or RS-232C port)

One channel of serial port is provided for use as a touch panel connector (for a CONTEC flat panel display) or RS232C port (with the SERIAL3-4 bracket mounted).

You can use BIOS Setup (described in Chapter 3) to configure an I/O address, interrupt and unused state for this port. (The same I/O address and IRQ cannot be shared with any other device.)

Table 5.6. Serial port C I/O Addresses and Interrupts

COM	I/O address	Interrupt
1	3F8h - 3FFh	IRQ 3 IRQ 4
2	2F8h - 2FFh	IRQ 5 IRQ 7
3	3E8h - 3EFh	IRQ 9 IRQ 10
4	2E8h - 2EFh	IRQ 11 IRQ 15

The BIOS defaults to the following factory settings:

```
Serial port C : COM3(3E8h-3EFh),IRQ5
```

Output connectors available with the SERIAL3-4 bracket

The output connectors available with the SERIAL3-4 bracket mounted are RS-232C compliant serial ports same as the SERIAL 1/2 output connectors.

Serial port D (RS-422/485 port or RS-232C port)

One channel of serial port is provided for use as a RS-422/485 port (with the RAS-PRINTER bracket mounted) or RS232C port (with the SERIAL3-4 bracket mounted).

You can use BIOS Setup (described in Chapter 3) to configure an I/O address, interrupt and unused state for this port. (The same I/O address and IRQ cannot be shared with any other device.)

Table 5.7. Serial port D I/O Addresses and Interrupts

COM	I/O address	Interrupt
1	3F8h - 3FFh	IRQ 3 IRQ 4
2	2F8h - 2FFh	IRQ 5 IRQ 7
3	3E8h - 3EFh	IRQ 9 IRQ 10
4	2E8h - 2EFh	IRQ 11 IRQ 15

The BIOS defaults to the following factory settings:

```
Serial port D : COM4(2E8h-2EFh),IRQ11
```

Output connector with the RAS-PRINTER bracket mounted (factory default)

Table 5.8. Output connector with the RAS-PRINTER bracket mounted (factory default) (RAS Connector)

Pin No.	Signal	Meaning
2	TX +	Transmitted data +
10	TX -	Transmitted data -
3	RX +	Received data +
11	RX -	Received data -

Reference

For more information on the RAS connector see Table 5.19, "RAS connector."

Output connector with the SERIAL3, 4 bracket mounted

The output connectors available with the SERIAL3-4 bracket mounted are RS-232C compliant serial ports same as the SERIAL 1/2 output connectors.

RS-422/RS-485 Specifications

- Transmission method : RS-422/RS-485-compliant, asynchronous, serial transmission, half duplex/full duplex
- Baud rate : 19200 - 50bps (programmable)
- Signal extension distance : 1.2km Max.

Terminal Resistor when RS-485 is in Use

Set with JP3 inside the top cover. The factory setting is " terminal resistor not available."

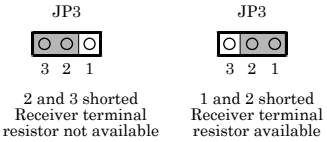


Figure 5.2. Terminal Resistor Settings

Control of Transmitted Data in Half-Duplex Mode

In half-duplex mode, the transmission buffer needs to be controlled in order to prevent collision of transmitted data. The BOX-PC uses RTS and controls the buffer with modem control register's bit 1. Transmission and reception gate control by the register setting of port address 4006h and 4007h is allowed only for the RS-422/485 (Serial port D). For more information see section, "General-purpose I/O and Remote Reset" in Chapter 5.

Modem control register

(Set I/O address +4H) bit 1 : 0 … RTS is High (Disable transmission)
1 … RTS is Low. (Enable transmission)

I/O Addresses and Instructions

The I/O addresses and instructions of COM1 are shown next.

Table 5.9. I/O Addresses

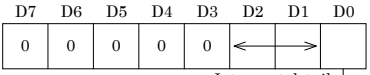
I/O address	DLAB	Read/Write	Register	
03F8H	0	W	Transmitter holding register	THR
		R	Receive buffer register	RBR
	1	W	Divisor latch register	DLL
03F9H	1	W	Divisor latch register	DLM
	0	W	Interrupt enable register	IER
03FAH	X	R	Interrupt ID register	IIR
03FBH	X	W	Line control register	LCR
03FCH	X	W	Modem control register	MCR
03FDH	X	R	Line status register	LSR
03FEH	X	R	Modem status register	MSR
03FFH	X	R/W	Scratch register	SCR

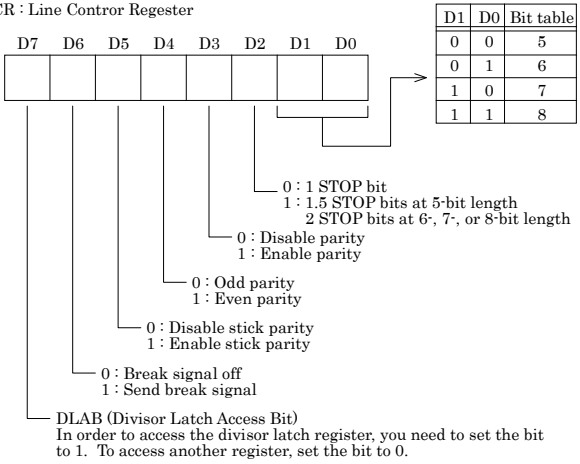
DLAB (Divisor Latch Access Bit) : The value in bit 7 of the line control register

Table 5.10. Function of Each Register < 1 / 4 >

I/O address	Description
03F8H	THR: Transmitter Holding Register [DLAB=0] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Register dedicated to write transmitted data to
03F8H	RBR: Reciever Buffer Register [DLAB=O] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Register dedicated to read received data from
03F8H	DLL: Divisor Latch (LSB) [DLAB=1] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Baud rate setting register (LSB)
03F9H	DLH: Divisor Latch (MSB) [DLAB=1] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Baud rate setting register (MSB)
03F9H	IER: Interrupt Enable Register [DLAB=0] D7 D6 D5 D4 D3 D2 D1 D0 0 0 0 0 EMS ELSI ETHREI ERDAI ERDAI: Received data Interrupt enable ETHREI: Received data register empty Interrupt enable ELSI: Receiver line status Interrupt enable EMS: Modem status interrupt enable [Always used at 0.] 1: Enable interrupt 0: Disable interrupt

Table 5.10. Function of Each Register < 2 / 4 >

<table>
<tr><th>I/O address</th><th>Description</th></tr>
<tr><td>03FAH</td><td>
IIR : Interrupt Identification Register


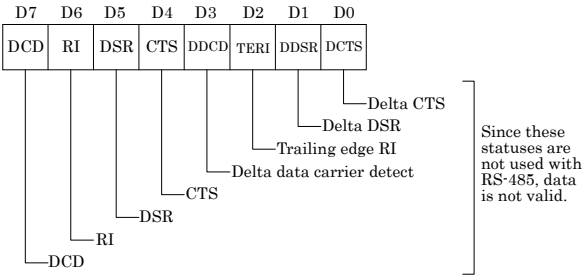
<table>
<tr><th>bit2</th><th>bit1</th><th>bit0</th><th>Priority</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>1</td><td>——</td><td>Interrupts are not generated.</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>1 (high)</td><td>Generated by overrun, parity, framing error or break interrupt.
Cleared when the line status register is read.</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>2</td><td>Generated when the receive buffer register is ready.
Cleared when the receiving buffer is read.</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>3</td><td>Generated when the transmitter holding register is empty. Cleared when the IIR is read or when transmitted data is written to THR.</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>4 (low)</td><td>Modem status interrupt is generated.
(CTS, DSR, RI, CD)
Cleared when the modem status register is read.</td></tr>
</table>
</td></tr>
<tr><td>03FBH</td><td>
LCR : Line Contror Regester


<table>
<tr><th>D1</th><th>D0</th><th>Bit table</th></tr>
<tr><td>0</td><td>0</td><td>5</td></tr>
<tr><td>0</td><td>1</td><td>6</td></tr>
<tr><td>1</td><td>0</td><td>7</td></tr>
<tr><td>1</td><td>1</td><td>8</td></tr>
</table>
</td></tr>
</table>

Table 5.10. Function of Each Register < 3 / 4 >

<table>
<tr><th>I/O address</th><th>Description</th></tr>
<tr><td>03FCH</td><td>MCR: Modem Control Register
<table>
<tr><th>D7</th><th>D6</th><th>D5</th><th>D4</th><th>D3</th><th>D2</th><th>D1</th><th>D0</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>Loop</td><td>IRQ</td><td>X</td><td>RTS</td><td>DTR</td></tr>
</table>
DTR 0 : Inactive [HIGH]
1 : Active [LOW]
RTS 0 : Inactive [HIGH]
1 : Active [LOW]
Interrupt control bit
0 : Disable
1 : Enable
Diagnostic local loop-back test
0 : Disable
1 : Enable</td></tr>
<tr><td>03FDH</td><td>LSR: Line Status Regester
<table>
<tr><th>D7</th><th>D6</th><th>D5</th><th>D4</th><th>D3</th><th>D2</th><th>D1</th><th>D0</th></tr>
<tr><td>0</td><td>TEMT</td><td>THRE</td><td>BI</td><td>FE</td><td>PE</td><td>OE</td><td>DR</td></tr>
</table>
Data ready (1 for existence of received data)
Overrun error (1 for occurrence of an error)
Parity error (1 for occurrence of an error)
Framing error (1 for occurrence of an error)
Break interrupt (1 for detection of break state)
Transmitter holding register empty (1 for transmission buffer being empty)
Transmitter empty (Set to 1 when both transmitter holding register and transmitter shift register are empty.)</td></tr>
</table>

Table 5.10. Function of Each Register < 4 / 4 >

I/O address	Description
03FEH	MSR : Modem Status Register 
03FFH	SCR : Scratchpad Register This is an 8-bit, readable/writable register which is available to the user to allow data to be saved temporarily.

Baud Rate Settings

A baud rate is set by software by dividing the clock input (1.8432MHz). The baud rate in terms of hardware can be set to a maximum of 115,200 bps. The baud rates available in practice depend on the operating environment (cable, software, etc.). The table below lists typical baud rates and their respective values to be written to the divisor latch register (LSB, MSB).

Table 5.11. Baud Rate Settings

Baud rate to be set	Value to be set in the divisor register	Setting error (%)
50	2304	---
75	1536	---
110	1047	0.026
134.5	857	0.058
150	768	---
300	384	---
600	192	---
1200	96	---
1800	64	---
2000	58	0.69
2400	48	---
3600	32	---
4800	24	---
7200	16	---
9600	12	---
19200	6	---

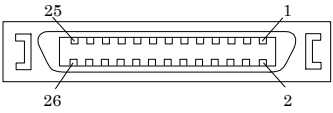
Example: To set 9,600 bps, write "00" to the (MSB) divisor latch register and "12 (decimal)" to the (LSB) divisor latch register.

Floppy Disk Interface

The BOX-PC is equipped with a FD controller to allow one FD drive to be connected to the FD connector named FD on the front end. Use the FD drive that is available as a dedicated option.

Table 5.12. FD Connector

Connector in use	26-socket, half-pitch connector, Equivalent to the DX10G1M-26SE



Pin No.	Signal	Direction	Pin No.	Signal	Direction
1	HDSEL	Output	2	WRTPRT	Input
3	RDATA	Input	4	TRK0	Input
5	GND	-----	6	GND	-----
7	GND	-----	8	WGATE	Output
9	GND	-----	10	GND	-----
11	WDATA	Output	12	GND	-----
13	DENSEL	Output	14	STEP	Output
15	DENSEL	Output	16	DIR	Output
17	N.C.	-----	18	MTR_ON	Output
19	DRV_SEL	Output	20	N.C.	-----
21	+5V	-----	22	DSKCHG	Input
23	+5V	-----	24	N.C.	-----
25	INDEX	Input	26	+5V	-----

Compatible Connector on the Cable Side

Plug connector : AMP, P/N 1756774-4 (AWG#28 for pressure welding)
Shield case kit : AMP, P/N 1756774-4

or

Plug connector : 3M, P/N 10126-6000EL (AWG#28 for pressure welding)
Shell : 3M, P/N 10326-3210-000

or

Plug connector : 3M, P/N 10126-3000VE (AWG#24 - #30 provided with solder)
Shell system : 3M, P/N 10326-52F0-008 (Non-shield shell kit)

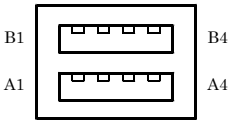
Cable Length

Use within a maximum cable length of 60cm.

USB Ports

The BOX-PC is equipped with two USB interface channels.

Table 5.13. USB Connector



Pin No.	Signal	Pin No.	Signal
A1	USB0 Vcc	B1	USB1 Vcc
A2	USB0 -Data	B2	USB1 -Data
A3	USB0 +Data	B3	USB1 +Data
A4	USB0 GND	B4	USB1 GND

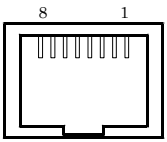
Ethernet

A Fast Ethernet interface is provided.

- Network type : 100BASE-TX/10BASE-T
- Transmission speed * : 100M/10M bps
- Max. network path length : 100m/segment
- Controller : ICH2 integrated (Intel)

* Operation at 100Mbps requires a category 5 cable.

Table 5.14. Ethernet Connector

Connector type	RJ-45	
		
Pin No.	Signal	Meamimg
1	TD+	Transmitted data (+)
2	TD-	Transmitted data (-)
3	RD+	Received data (+)
4	N.C.	Not connected
5	N.C.	Not connected
6	RD-	Received data (+)
7	N.C.	Not connected
8	N.C.	Not connected

LEDs for

FDX : Full D display of network statuses:

LINK : Full-duplex mode indicator

100M : 100M-operation indicator

LAN drivers

Visit the CONTEC web site to download the LAN driver (IPC-SLIB-01) for the OS running on your BOX-PC.

For the download, see Chapter 7 “List of Options".

PC Card Slots

PCMCIA compliant, CardBus compatible card slots are provided.

[TYPE II x 2 (TYPE III x 1) size]

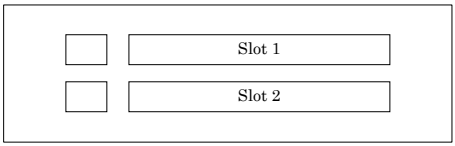


Figure 5.3. Slot Numbers and Locations

⚠ CAUTION

A type III card should be inserted into slot 2.

Attaching the Metal Brace to Keep the Card in Place

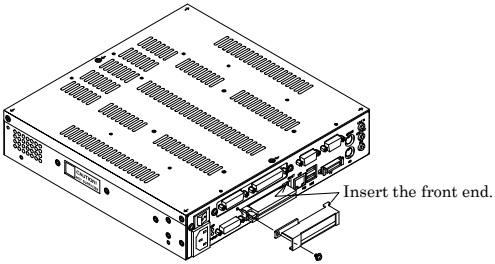


Figure 5.4. Attaching the Metal Brace to Keep the Card in Place

Power Supply to the Card

The voltage that can be used and the current capacity of each slot are as shown below:

Table 5.15. Power Supply to the Card

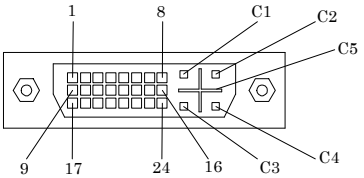
Voltage	Current capacity (Max.)
+5V	1A/Slot
+3.3V	1A/Slot
+12V	Not supplied.

DVI Interface

A DVI interface is provided. You can use it to connect a display (even a DB-15 connector is acceptable by using the bundled DVI-analog RGB adapter) or a CONTEC Panel Link display. The connector is named DVI (DVI-I 29-pin connector).

Table 5.16. DVI Connector

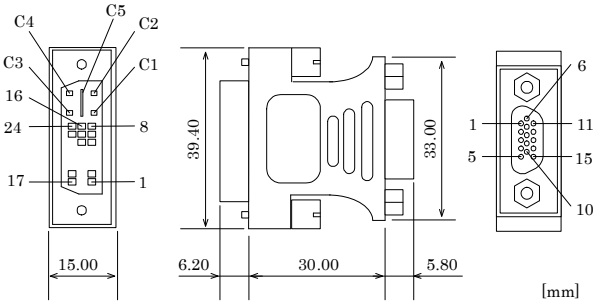
Connector	DVI-I 29pin



Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	DATA2-	13	N.C.	C1	RED
2	DATA2+	14	+5V	C2	GREEN
3	DATA2 SHIELD	15	GND	C3	BLUE
4	N.C.	16	HPD	C4	HSYNC
5	N.C.	17	DATA0-	C5	GND
6	DDC CLK	18	DATA0+		
7	DDC DATA	19	DATA0 SHIELD		
8	VSYNC	20	TXD		
9	DATA1-	21	RXD		
10	DATA1+	22	DATA0 SHIELD		
11	DATA1 SHIELD	23	CLK+		
2	N.C.	24	CLK-		

Table 5.17. DVI-Analog RGB conversion adapter

Connector	DVI-I 29pin



Analog RGB signals			
Pin No.	Signal	Pin No.	Signal
1	RED	9	HPD
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	DDC DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC CLK
8	GND		

The table below lists the LCDs that can be connected. Note that in order to connect an LCD, you need a connecting cable.

Display	Model	Display
12.1inch TFT with a panel-mounting touch panel	IPC-DT/L40S(PC)T	SVGA (800 x 600)
15inch TFT with a panel-mounting touch panel	IPC-DT/H40X(PC)T	XGA (1024 x 768)
12 inch TFT with a desktop/wall-mounted touch panel	IPC-DT/L440(PC)TA IPC-DT/L440(PC)TB	SVGA (800 x 600)

Display Driver

Visit the CONTEC web site to download the Display driver (IPC-SLIB-01) for the OS running on your BOX-PC.

For the download, see Chapter 7 “List of Options".

Serial Interface for Touch Panel (Inside the LCD connector)

The BOX-PC is equipped with a serial port (Serial port C) to communicate with a touch panel when an LCD equipped with a touch panel is used. The I/O address, interrupt, or "not in use" can be set with BIOS setup (see Chapter 4). (Do not set to the same I/O address and interrupt as those of another device.)

Set to the same values as were set during installation of the touch-panel driver software.

Visit the CONTEC web site to download the Touch Panel driver (IPC-SLIB-01) for the OS running on your BOX-PC.

For the download, see Chapter 7 “List of Options".

Printer Port Interface

A printer port is provided for use with the RAS-PRINTER bracket mounted. You can use BIOS Setup to configure an operation mode, I/O address, interrupt, DMA channel and unused state for this port.
The connector is named PRINTER.

Table 5.18. Printer Ports and I/O Addresses

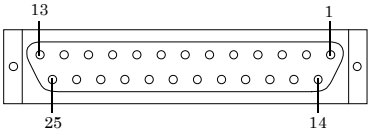
I/O address	Interrupt
3BCh-3BFh	IRQ 5 IRQ 7
378h-37Fh	
278h-27Fh	

The BIOS defaults to the following factory settings:

```
Parallel port : ECP,378h - 37Fh,IRQ7,DMA3,
```

Table 5.19. Printer Port Connector

Connector used on the unit	25pin D-SUB (FEMALE)



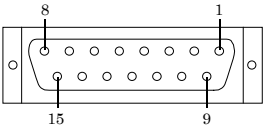
Pin No.	Signal	Meaning	Direction	Pin No.	Signal	Meaning	Direction
1	-STRB	Enable data	Output	14	-AFEED	Automatic feed	Output
2	D 0	Data bit 0	Output	15	-ERROR	Not available	Input
3	D 1	Data bit 1	Output	16	-INIT	Initialize	Output
4	D 2	Data bit 2	Output	17	-SELECT*IN	Input allowed	Output
5	D 3	Data bit 3	Output	18	GND	Ground	-----
6	D 4	Data bit 4	Output	19	GND	Ground	-----
7	D 5	Data bit 5	Output	20	GND	Ground	-----
8	D 6	Data bit 6	Output	21	GND	Ground	-----
9	D 7	Data bit 7	Output	22	GND	Ground	-----
10	-ACK	Ready to accept data	Input	23	GND	Ground	-----
11	BUSY	Busy	Input	24	GND	Ground	-----
12	PE	Out of paper	Input	25	GND	Ground	-----
13	SELECT	Select state	Input	-----			

Fastening screw: No. 4-40 UNC inch thread

RAS Functions

A RAS port is provided for use with the RAS-PRINTER bracket mounted. This port offers watchdog timer, remote reset, and general-purpose I/O RAS functions.

Table 5.20. RAS Connector

Connector type		15pin D-SUB(FEMALE) (DALC-J15SAF-20L9) JAE
		
Pin No.	Signal	Function
1	SPK	External speaker signal
9	GND	External speaker ground
2	TX +	RS-485 transmitting line
10	TX -	
3	RX +	RS-485 receiving line
11	RX -	
4	NCOM	Minus common dedicated to PO2
12	PO2/WDT	General-purpose output or watchdog timer alarm output
5	PO0	General-purpose output
13	PO1	
6	NCOM	General-purpose output minus common
7	PI1	General-purpose input
14	PI2/IRQ	General-purpose input or interrupt input
8	PCOM	General-purpose input plus common
15	PI0	General-purpose input

*Fastening screw: No. 4-40UNC inch thread

port address: 4000h - 4007h

⚠ CAUTION

Pin 4 NCOM (minus common dedicated to PO2) and pin 6 NCOM (minus common shared by PO0 and PO1) are electrically separated from each other.

Watchdog Timer

The watchdog timer is started by output of A5 to I/O port address 4002h. A second output of A5 to the same port within the specified expiration time once again triggers the watchdog timer. If a time-out occurs, a reset or an interrupt is generated according to the 4004h port setting or an alarm is output according to the 4004h port setting.

The time-out period can be set between 1 and 255 seconds depending on the timer value setting for the WDT counter port (4003h).

The watchdog timer stops by reading port 4002h. The alarm-out output is cancelled at the same time.

The alarm out is output from the RAS connector's PO2/WDT (pin 12) and cancelled when reset.

The alarm-out output can be set to BIOS startup by BIOS setup (see Chapter 4), watchdog timer startup, or watchdog timer time-up.

Specifications

- Time to be set : 1sec - 255sec
- Interrupt or reset : Resets or generates an interrupt at time-up (Port setting).
- External alarm output : Optocoupler isolated open-collector output (the output status is set by software). For more information, see the general-purpose I/O specifications.
- I/O addresses : 4000h - 4007h (RAS port)

How to Use the Watchdog Timer

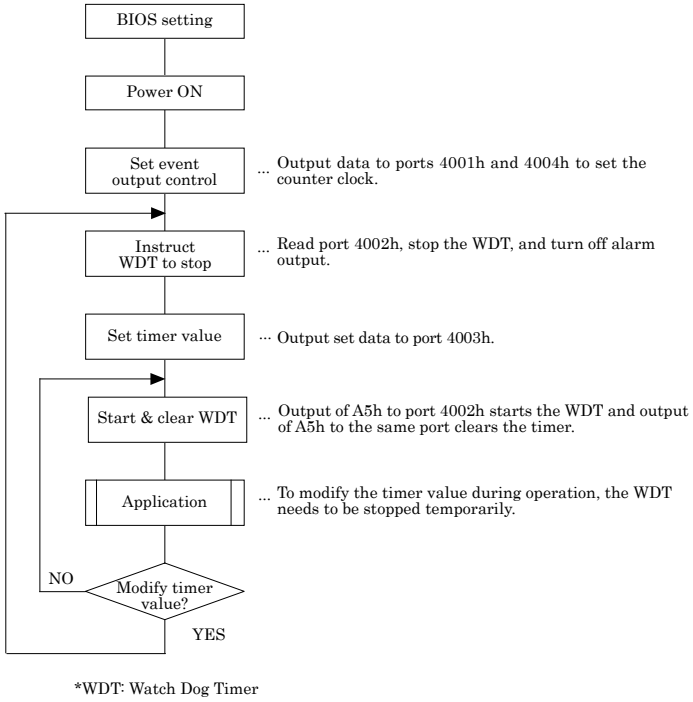


Figure 5.5. How to Use the Watchdog Timer

Example usage: To assign IRQ5 to the event whose time-up value is 15sec:

Out 4004h 01h : Set the event at the time of WDT expiration to IRQ5.

In 4002h : Stop the WDT timer and cancel the alarm.

Out 4003h 0Fh : Set the WDT expiration time to 15sec.

Out 4002h A5h : Start and clear the WDT.

In 4002h : Stop the WDT and cancel the alarm.

*** 4001h (bit4-6): Alarm out output control**

D7	D6	D5	D4	D3	D2	D1	D0	
---	WD_S1	WD_S0	PO2_M	RESET	PIM2	PIM1	PIM0	R/W (default: XXXX0000b)

Figure 5.6. Alarm Out Output Control Port (4001h)

PO2_M : PO PO2/WDT pin output setting

0 : Set the RAS connector's PO2/WDT(12) signal to PO2 (general-purpose output).

1 : Set the RAS connector's PO2/WDT(12) signal to alarm out.

Table 5.21. WD_S1, WD_S0: Alarm-out Output Status Settings

WD_S1	WD_S0	External alarm output status			
		When power is turned off *1	When BIOS starts *1	When WDT starts	When time expires on WDT
0	0	OFF	OFF	OFF	ON
1	0	OFF	OFF	ON	OFF
1	1	OFF	ON	ON	OFF
0	1	OFF	ON	OFF	ON

*** 4002h WDT control**

D7	D6	D5	D4	D3	D2	D1	D0	
—	—	—	—	—	—	—	—	R/W

Figure 5.7. WDT Control Port (4002h)

R : Cancels WDT stop/alarm.
Read data is undefined.

W : Start and clear the WDT.
Write A5h to start and clear the WDT.

*** 4003h: WDT counter**

D7	D6	D5	D4	D3	D2	D1	D0	
T7	T6	T5	T4	T3	T2	T1	T0	W

Figure 5.8. WDT Counter Port (4003h)

W : Writes watchdog timer count data.
Write watchdog timer counter expiration time data.

1sec → 01h
8sec → 08h
15sec → 0Fh
30sec → 1Eh

*** 4004h : Event output control**

D7	D6	D5	D4	D3	D2	D1	D0	
---	---	---	---	RESET	WM2	WM1	WM0	R/W (Default: XXXX0000b)

Figure 5.9. Event Output Control Port (4004h)

Table 5.22. WM2 - WM0: Interrupt Output Modes

WM2	WM1	WM0	Interrupt output at occurrence of WDT errors
0	0	1	Output to IRQ5 when time expires on the WDT.
0	1	0	Output to IRQ7 when time expires on the WDT.
0	1	1	Output to IRQ9 when time expires on the WDT.
1	0	0	Output to IRQ10 when time expires on the WDT.
1	0	1	Output to IRQ11 when time expires on the WDT.
Others			Inhibits output when time expires on the WDT.

Table 5.23. RESET: Reset Output Modes

RESET	RESET output at occurrence of WDT errors
0	Inhibits RESET output when time expires on the WDT.
1	Allows RESET output when time expires on the WDT.

Note! When time expires on WDT, the alarm-out is output irrelevant to the settings of the port for controlling event output.

*** 4005h : RAS status port**

D7	D6	D5	D4	D3	D2	D1	D0		
—	—	—	—	—	—	—	WDT	R	(Default: XXXXXXX0b)

Figure 5.10. RAS Status Port (4005h)

R : RAS status port

WDT : WDT status

This is the WDT status bit. This bit is cleared when the WDT stops (read port 4002h).

0 : The WDT is either stopped or counting.

1 : The time set on the WDT expired.

General-purpose I/O and Remote Reset

The BOX-PC is equipped with three general-purpose isolated signals each for input and output. The input signals can also be used for interrupt input or remote reset input.

Specifications

[Input]

- Input specifications : Current-driven input by Optocoupler isolation.
- Input resistance : 4.7kΩ
- Input signal count : 3 [One of them can be used for remote reset and interrupt input. (bit2<fixed>)]
- Input protection circuit : Equipped with a reverse-connection protection diode
- Input response time : Less than 100μsec
- External circuit power supply : 12 - 24VDC (±10%)

[Output]

- Output specifications : Open-collector output by Optocoupler isolation
- Output rating : Max. 30VDC, 100mA
- Output signal count : 3 [One of them can be used for WDT alarm output. (bit2<fixed>)]
- Output response time : Less than 300μsec

[Common]

- I/O addresses 4000h and 4001h

How to Use General-purpose I/O and Remote Reset

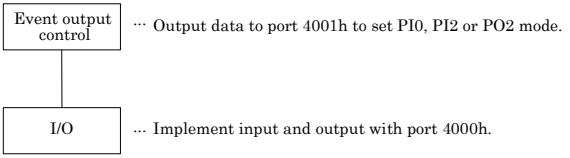


Figure 5.11. How to Use General-purpose I/O and Remote Reset

I/O Addresses and Instructions

*** 4000h : General-purpose I/O**

D7	D6	D5	D4	D3	D2	D1	D0	
—	—	—	—	—	PIO2	PIO1	PIO0	R/W

Figure 5.12. General-purpose Input Port (4000h)

R : Read data from PI0, PI1 and PI2.

W : Set data to be output to PO0, PO1 and PO2.

*** 4001h (bit0-3): PI2/IRQ(14) event input control**

D7	D6	D5	D4	D3	D2	D1	D0
—	WD_S1	WD_S0	PO2_M	RESET	PIM2	PIM1	PIM0

Figure 5.13. Event Input Control Port (4001h)

Table 5.24. PIM2 - PIM0

RIM2	RIM1	RIM0	PI2/IRQ (14) interrupt input
0	0	1	Input the RAS connector's PI2/IRQ (14) signal to IRQ5.
0	1	0	Input the RAS connector's PI2/IRQ (14) signal to IRQ7.
0	1	1	Input the RAS connector's PI2/IRQ (14) signal to IRQ9.
1	0	0	Input the RAS connector's PI2/IRQ (14) signal to IRQ10.
1	0	1	Input the RAS connector's PI2/IRQ (14) signal to IRQ11.
Others			Inhibit the RAS connector's PI2/IRQ (14) signal interrupt to be set.

Table 5.25. RESET: RESET: Reset Input Modes

RESET	PI2/IRQ (14)'s RESET input
0	Inhibit the remote reset input function of the RAS connector's PI2/IRQ (14) signal.
1	Use as the remote reset input function of the RAS connector's PI2/IRQ (14) signal.

⚠ CAUTION

A bit indicated with "rsv" is used by the system. Do not modify the bit.

*** 4006h : Index address setting**

D7	D6	D5	D4	D3	D2	D1	D0	
—	—	—	—	—	—	AD1	AD0	W

Figure 5.14. Index Address Setting Port (4006h)

W : Index address setting
When specifying the RS-485 setting with port 4007h, output 00h to this port before you specify the setting. (* Index addresses other than 00h are used by the system. Do not set addresses except for 00h.)

*** 4007h : Control of RS-485 transmission and reception**

D7	D6	D5	D4	D3	D2	D1	D0		
—	—	—	—	RE_GATE	TE_GATE	TE_SEL	rsv*	R/W	(Default: XXXX0000b)

Figure 5.15. RS-485 Transmission and Reception Control Port (4007h)

TE_SEL : Select the RS-485 transmission enable signal.
- 0 : Sets the RTS signal to the RS-485 transmission enable signal. (factory setting)
- 1 : Sets the TE_GATE value to the RS-485 transmission enable signal.

TE_GATE : RS-485 transmission enable signal. Valid only when the TE_SEL value is "1."
- 0 : RS-485 transmission Enable (factory setting)
- 1 : RS-485 transmission Disable

RE_GATE : RS-485 reception enable signal.
- 0 : RS-485 reception Enable (factory setting)
- 1 : RS-485 reception Disable

⚠ CAUTION

A bit indicated with "rsv" is used by the system. Do not modify the bit.

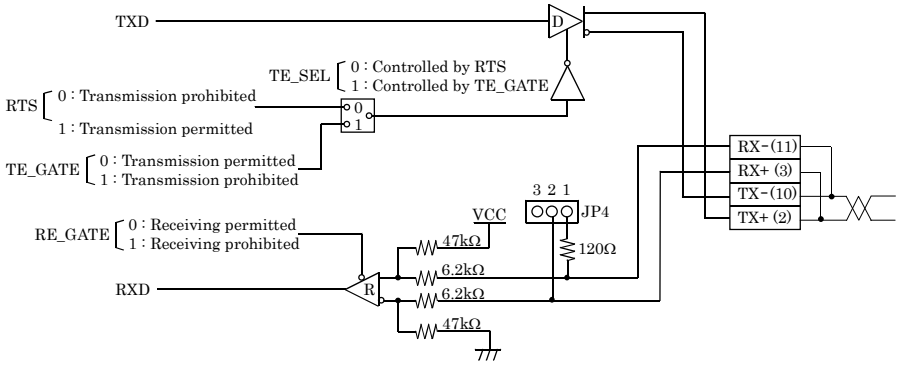


Figure 5.16. Half-Duplex Connection Method

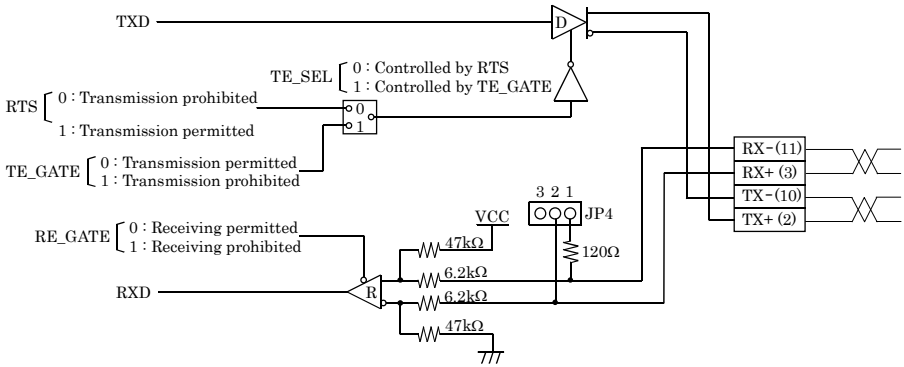


Figure 5.17. Full-Duplex Connection Method

External I/O Circuit

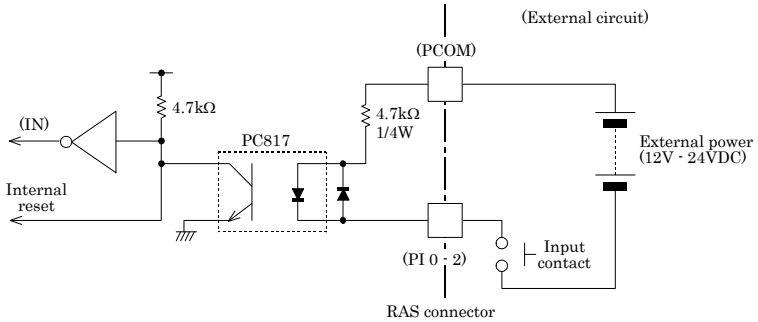


Figure 5.18. Input Circuit

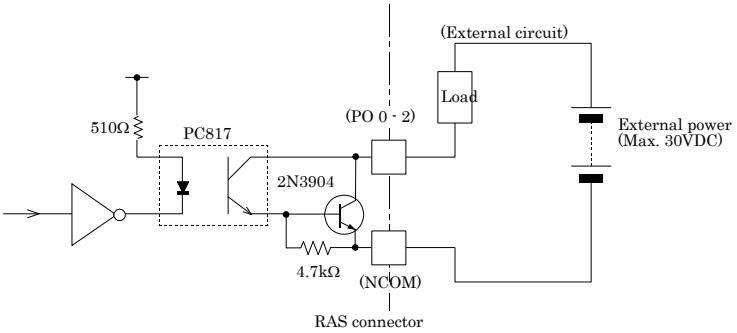


Figure 5.19. Output Circuit

S1

To use the RAS-PRINTER bracket, set bits 6 and 6 in the S1 jumper to OFF (factory default). To use the SERIAL3-4 bracket, set bits 5 and 6 in the S1 jumper to ON instead.

Do not modify the settings of S1 bits 1 - 4, 7 and 8 since they are used by the system.

Figure 5.20. Factory Settings

Table 5.26. S1 Settings

Bit	ON	OFF
1	Fixed at OFF (system-reserved)	
2	Fixed at OFF (system-reserved)	
3	Fixed at OFF (system-reserved)	
4	Fixed at OFF (system-reserved)	
5	Use SERIAL 3-4	Use RAS-PRINTER
6	Use SERIAL 3-4	Use RAS-PRINTER
7	Fixed at OFF (system-reserved)	
8	Fixed at OFF (system-reserved)	

Reset Switch

The BOX-PC is equipped with a hardware reset switch. To prevent it from being pressed by mistake, the switch is designed to be difficult to press. Use a pointed object to push the switch with.

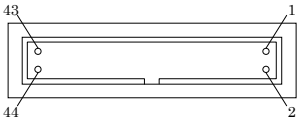
IDE Interface

Connector for the Internal Drive (Primary IDE Connector)

The BOX-PC is equipped with an E-IDE controller to allow a 2.5inch IDE hard disk to be connected to connector CN1 on the board.

Table 5.27. Primary IDE Connector (CN6)

Connector in use	44-socket header type (2mm pitch)



Pin No.	Signal	Direction	Pin No.	Signal	Direction
1	RESET-	Output	2	GND	-------
3	DD7	I/O	4	DD8	I/O
5	DD6	I/O	6	DD9	I/O
7	DD5	I/O	8	DD10	I/O
9	DD4	I/O	10	DD11	I/O
11	DD3	I/O	12	DD12	I/O
13	DD2	I/O	14	DD13	I/O
15	DD1	I/O	16	DD14	I/O
17	DD0	I/O	18	DD15	I/O
19	GND	-------	20	N.C.	-------
21	DDRQ	Input	22	GND	-------
23	DIOW-	Output	24	GND	-------
25	DIOR-	Output	26	GND	-------
27	IOCHRDY	Input	28	DALE	Output
29	DDACK-	Output	30	GND	-------
31	INTRQ	Input	32	N.C.	-------
33	DA1	Output	34	N.C.	Output
35	DA0	Output	36	DA2	Output
37	CSI-	Output	38	CS3-	-------
39	DACT-	Output	40	GND	-------
41	+5V	-------	42	+5V	-------
43	GND	-------	44	N.C.	

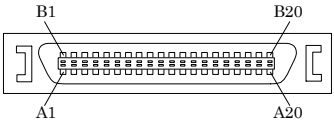
Secondary IDE Connector-CN2

Use the dedicated option cable to connect the option CD-ROM drive.

The cable is not intended to connect devices (such as hard disks) other than CONTEC option products.

Table 5.28. Secondary IDE Connector (CN2)

Connector in use	40pin, half-pitch type (1.27mm pitch)



Pin No.	Signal	Direction	Pin No.	Signal	Direction
A1	RESET-	Output	B1	GND	-------
A2	DD7	I/O	B2	DD8	I/O
A3	DD6	I/O	B3	DD9	I/O
A4	DD5	I/O	B4	DD10	I/O
A5	DD4	I/O	B5	DD11	I/O
A6	DD3	I/O	B6	DD12	I/O
A7	DD2	I/O	B7	DD13	I/O
A8	DD1	I/O	B8	DD14	I/O
A9	DD0	I/O	B9	DD15	I/O
A10	GND	-------	B10	N.C.	-------
A11	DDRQ	Input	B11	GND	-------
A12	DIOW-	Output	B12	GND	-------
A13	DIOR-	Output	B13	GND	-------
A14	IOCHRDY	Input	B14	DALE	Output
A15	DDACK-	Output	B15	GND	-------
A16	INTRQ	Input	B16	N.C.	-------
A17	DA1	Output	B17	N.C.	-------
A18	DA0	Output	B18	DA2	Output
A19	CSI-	Output	B19	CS3-	Output
A20	DACT-	Output	B20	GND	-------

Expansion Slots (CP and C4P Model)

The CP model has two PCI/ISA bus expansion slots able to mount both PCI bus and ISA bus boards. The C4P model is provided with the two PCI/ISA slots and the two PCI slots where PCI bus boards only are mounted.

Board Dimensions Allowed

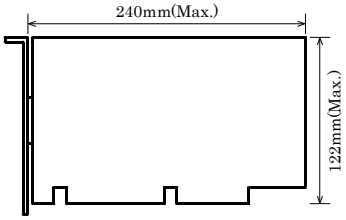


Figure 5.21. Expansion Board Dimensions

⚠ CAUTION

- A board that uses the back of the board edge connector (the shaded area in the figure) may not be mounted.
- The following signals cannot be used on ISA bus slots.
  -5V, IOCHK, REFRESH, MASTER
- The PCI bus conforms to the 32-bit specification. The operation of dual 64-bit/32-bit boards such as the ADAPTEC 39160SCSI board or Intel Pro1000/MT network board has not been verified.

Power Supply to Expansion Slots

The following table lists the voltage that can be supplied to a board in an expansion slot and the total current capacity of all slot:

Table 5.29. Expansion Slots

<IPC-BX/M620(PCW)CP>

Voltage	Current capacity (Max.)
+5V	2A
-5V	Not supplied
+12V	0.5A
-12V	80mA

<IPC-BX/M620(PCW)C4P>

Voltage	Current capacity (Max.)
+5V	4A
-5V	Not supplied
+12V	0.5A
-12V	80mA

⚠ CAUTION

Make sure that the total current consumption by the boards installed in the expansion slots does not exceed the above current capacity.

Board Installation Procedure

1. IPC-BX/M620(PCW)CP

(1) Be sure the power is turned off.

(2) Remove the top cover.

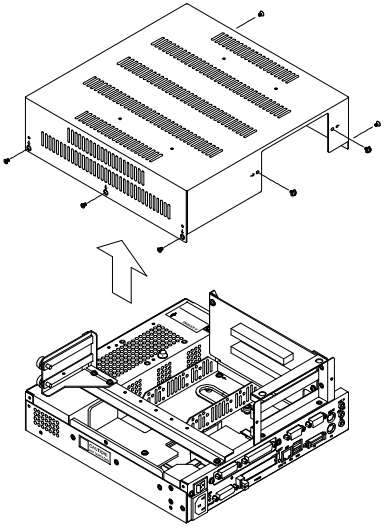


Figure 5.22. Removing the Top Cover

(3) Remove the brace that holds the printed circuit board (PCB) down.
Remove the screws on the brace. The brace will separate toward you.

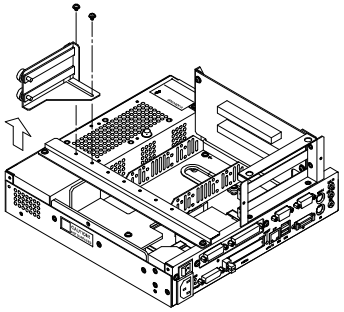


Figure 5.23. Removing the PCB Brace 2

(4) Insert the board into the slot and fasten it with screws.

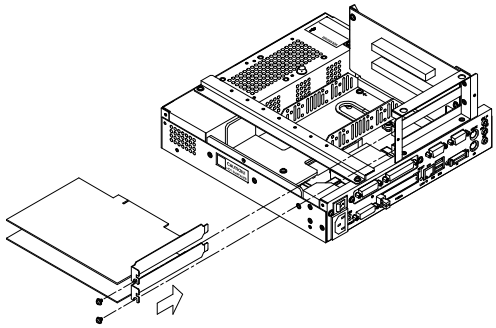


Figure 5.24. Installation of an Expansion Board

⚠ CAUTION

Make sure carefully that the board has been secured in the slot.

(5) Install the PCB brace. It can hold down a board if its height is at least 68mm.

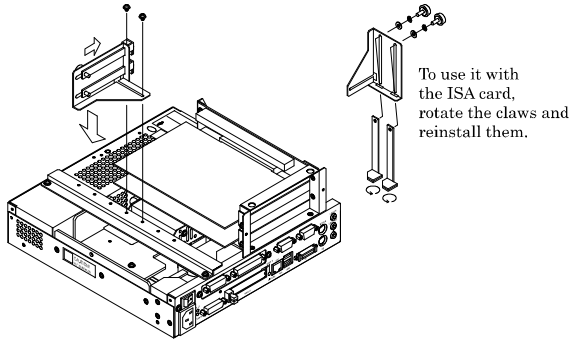


Figure 5.25. Attaching the PCB Brace

(6) Replace the expansion slot cover.

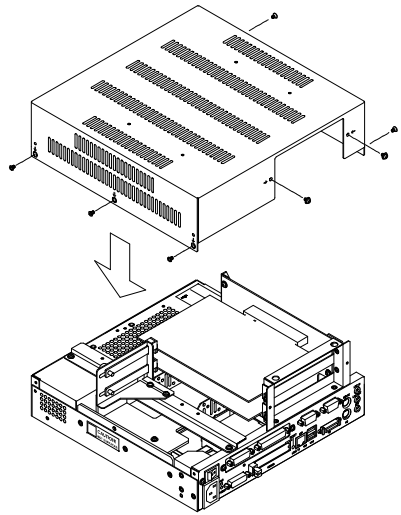


Figure 5.26. Replacing the Top Cover

2. IPC-BX/M620(PCW)C4P

(1) Be sure the power is turned off.

(2) Remove the top cover.

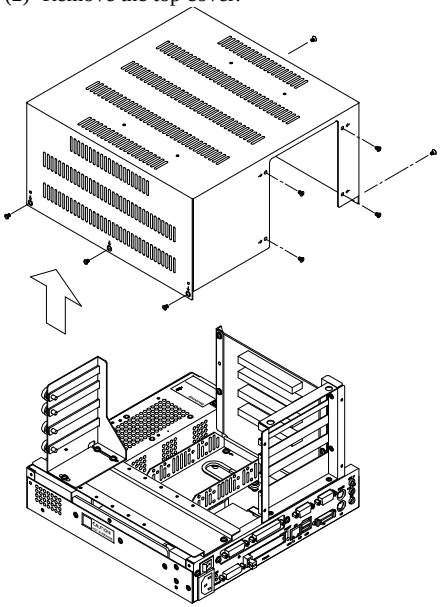


Figure 5.27. Removing the Top Cover

(3) Remove the brace that holds the printed circuit board (PCB) down. Remove the screws on the brace. The brace will separate toward you.

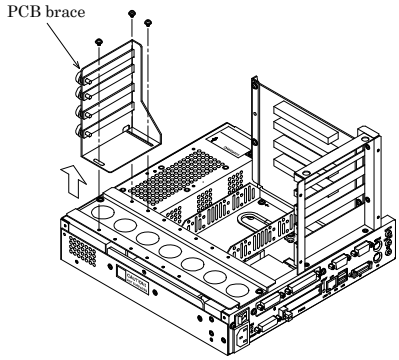


Figure 5.28. Removing the PCB Brace 2

(4) Insert the board into the slot and fasten it with screws.

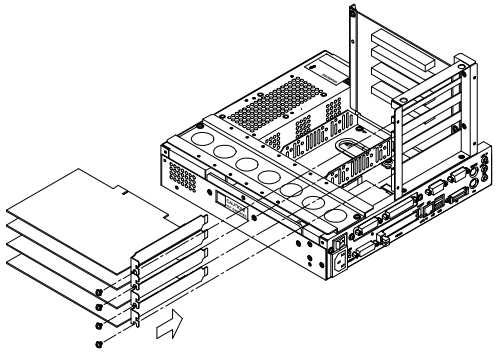


Figure 5.29. Installation of an Expansion Board

⚠ CAUTION

Make sure carefully that the board has been secured in the slot.

(5) Install the PCB brace. It can hold down a board if its height is at least 68mm.

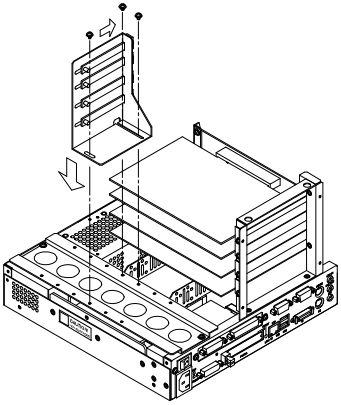


Figure 5.30. Attaching the PCB Brace

(6) Replace the expansion slot cover.

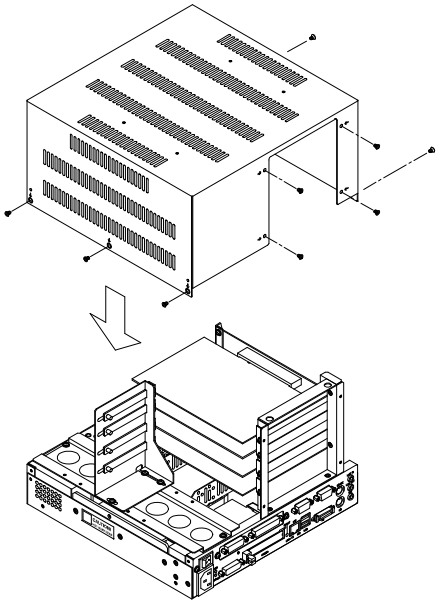


Figure 5.31. Replacing the Top Cover

6. Appendix

Memory Map

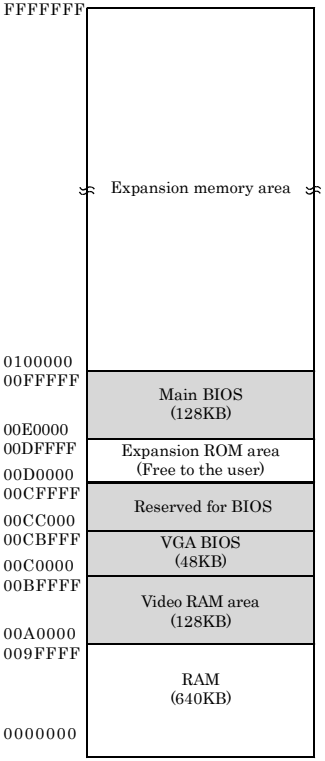


Figure 6.1. Memory Map

I/O Port Addresses

Table 6.1. I/O Port Addresses < 1 / 2 >

ADDRESS(HEX)	Description	Remark
000-00F	DMA controller 1 (slave)	ch0 - 3 (8-bit transfer)
010-01F	Reserved for system	
020-03F	Interrupt controller 1 (master)	
040-05F	Timer	
060-06F	Keyboard controller	
070-07F	RTC, NMI mask	
080-09F	DMA page register	
0A0-0BF	Interrupt controller 2 (slave)	
0C0-0DF	DMA controller 2 (master)	ch5 - 7 (16-bit transfer)
0E0-0FF	Reserved for system	
100-12F	Available to user	
140-16F	Available to user	
170-17F	IDE hard disk controller	Secondary
180-18F	Reserved for system	
190-1DF	Available to user	
1E8-1EF	Reserved for system	
1F0-1FF	IDE hard disk controller	Primary
200-277	Available to user	
278-27F	Reserved for parallel port	LPT2
280-2E7	Available to user	
2E8-2EF	Reserved for serial port	COM4(RS485, factory setting)
2F0-2F7	Available to user	
2F8-2EF	Serial port	COM2
300-35F	Available to user	
370-375	Reserved for system	
376-377	IDE hard disk controller	Secondary
378-3AF	Reserved for parallel port	LPT1(factory setting)
3B0-3BB	Reserved for system	
3BC-3BF	Reserved for parallel port	LPT3
3C0-3DF	Reserved for system	
3E0-3E7	PCMCIA	
3E8-3EF	Serial port	COM3(Touch panel, factory setting)
3F0-3F7	FD controller	
3F8-3FF	Serial port	COM1
4D0-4DF	Reserved for system	

Table 6.1. I/O Port Addresses < 2 / 2 >

ADDRESS(HEX)	Description	Remark
CF0-CFF	Reserved for system	
4000-4007	RAS functions	
4008-400F	Reserved for system	
46E8	Reserved for system	
83D0-B3D3	Reserved for system	

Interrupt Level List

Table 6.2. Hardware Interrupt Levels (Factory Settings)

Type	8259	Priority	Description	Vector	Remarks
NMI		High	-I/O CH CK	02H	
IRQ0	MASTER	↑	Timer 0	08H	
IRQ1	"	|	Keyboard	09H	
IRQ2	"	|	Interrupt controller 2 (slave)	0AH	
IRQ8	SLAVE	|	Real-time clock	70H	
IRQ9	"	|	Reserved for PCI device	71H	
IRQ10	"	|	Not in use	72H	Available to user
IRQ11	"	|	Serial port D (COM4)	73H	RS-485(factory setting)
IRQ12	"	|	Reserved for PS/2 mouse	74H	
IRQ13	"	|	Reserved for coprocessor	75H	
IRQ14	"	|	Reserved for hard disk	76H	Primary
IRQ15	"	|	Reserved for optional CD-ROM	77H	Secondary
IRQ3	MASTER	|	Serial port B (COM2)	0BH	
IRQ4	"	|	Serial port A (COM1)	0CH	
IRQ5	"	|	Serial port C (COM3)	0DH	Touch panel (Default factory setting)
IRQ6	"	↓	Reserved for floppy disk	0EH	
IRQ7	"	Low	Parallel port	0FH	

7. List of Options

Memory for extension (144pin SO-DIMM)

- PC-MSD128-144H 128MB SD memory module
- PC-MSD256-144V 256MB SD memory module

Silicon disk drive for extension (IDE 2.5inch)
[PCI Board Type] For IPC-BX/M620(PCW)CP

- PC-RSD1000-PCI 1GB silicon disk drive
- PC-RSD2000-PCI 2GB silicon disk drive
- PC-RSD4000-PCI 4GB silicon disk drive
- PC-RSD8000-PCI 8GB silicon disk drive

Hard disk drive (IDE 2.5inch)

- PC-HDD40G 40GB hard disk drive

Silicon disk drive (IDE 2.5inch)

- PC-ESD500-A 512MB silicon disk drive
- PC-ESD1000-A 1GB silicon disk drive
- PC-ESD2000-A 2GB silicon disk drive
- PC-ESD4000-A 4GB silicon disk drive
- PC-ESD8000-A 8GB silicon disk drive
- PC-ESD500 512MB silicon disk drive
- PC-ESD1000 1GB silicon disk drive
- PC-ESD2000 2GB silicon disk drive
- PC-ESD4000 4GB silicon disk drive
- PC-ESD8000 8GB silicon disk drive

Floppy disk unit

- PC-FDD25BH 3.5inch floppy disk drive (comes with a cable)

Terminal block for connecting the RAS connector

- IPC-PSD-20 Terminal block for connecting the RAS connector

TFT color liquid-crystal display

< Analog RGB types>

- FPD-H21XT-AC (15 inch 1024 x 768 dots, Panel mounted type)
- FPD-L21ST-AC (12.1 inch 800 x 600 dots, Panel mounted type)
- FPD-M21VT-AC (10.4 inch 640 x 480 dots, Panel mounted type)

TFT color liquid-crystal display

<Panel Link types>

- IPC-DT/H40X(PC)T	(15.0inch	1024 x 768 dots, Panel mounted type)
- IPC-DT/L40S(PC)T	(12.1 inch	800 x 600 dots, Panel mounted type)
- IPC-DT/L440(PC)TA	(12.1 inch	800 x 600 dots, Desktop/wall-mounted)
- IPC-DT/L440(PC)TB	(12.1 inch type)	800 x 600 dots, Desktop/wall-mounted, anti-glare

Panel link-DVI-D conversion cable

- IPC-DVI/D-020	DVI-D type display cable (2m)
- IPC-DVI/D -050	DVI-D type display cable (5m)

Display cable only for PanelLink

- IPC-DVIPL-020	DVI-PanelLink conversion display cable (2m)
- IPC-DVIPL-050	DVI-PanelLink conversion display cable (5m)

CD-ROM/ DVD-ROM drive

- IPC-CDD-03*3	CD-ROM/ DVD-ROM drive
- IPC-CDC-03	CD-ROM/ DVD-ROM drive cable

Driver

- IPC-SLIB-01	Driver & Utility Soft Set (CD-ROM version) *1*2

Ferrite Core

- FRC2009A-6	Ferrite Core 20/09mm (6 pieces)

*1 If your BOX-PC is an OS preinstalled model, the driver is supplied with the OS or already installed on the PC.

*2 You can download the driver from the Download Library (http://www.contec.com/download) on the CONTEC web site. If you need IPC-SLIB-01 (CD-ROM version), it is available as a separately priced option.

*3 Please Purchase an optional cable for connection [IPC-CDC-03].

* Check the CONTEC's Web site for the latest information on these options.

IPC-BX/M620(PCW) Series

User's Manual

IPC-BX/M620(PCW)-HMU

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