IPC Series

BOX-PC
for BX200 Series

User's Manual

CONTEC CO.,LTD.

Check Your Package

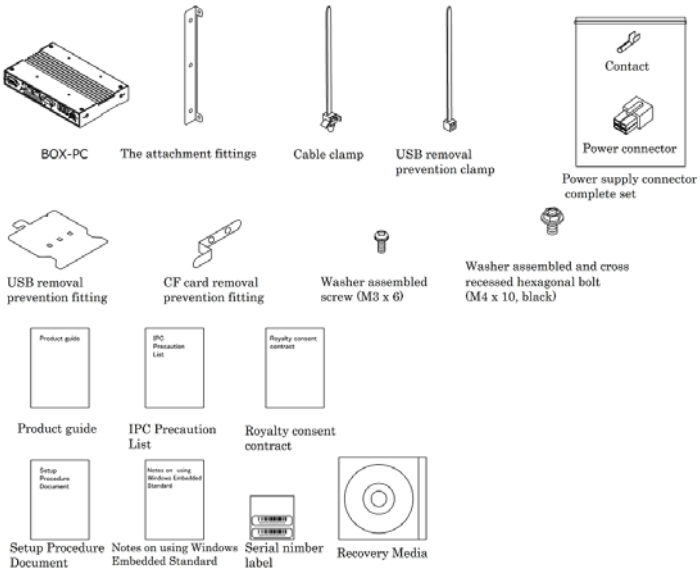
Thank you for purchasing the CONTEC product.
The product consists of the items listed below.
Check, with the following list, that your package is complete. If you discover damaged or missing items, contact your retailer. If you use IPC-SLIB-01 (driver&utility software set), download it from the CONTEC's Web site.
Product Configuration List

Name		BX-2x0-DCxx00 BX-2x0D-DCxx00 [Bae Model] Pcs.	BX-2x0-DCxx11 BX-2x0D-DCxx11 [OS PreInstallModel] Pcs.
BOX-PC		1	1
The attachment fittings		2	2
CF card removal prevention fitting		1	1 *1
USB removal prevention fitting		1	1
USB removal prevention clamp		2	2
Washer assembled screw (M3 x 6)		5	5
Washer assembled and cross recessed hexagonal bolt (M4 x 10, black)		4	4
Cable clamp		2	2
Power supply connector complete set	Power connector	1	1
	Contact	4	4
Product guide (this sheet)		1	1
IPC Precaution List		1	1
Serial number label		1	1
Royalty consent contract		None	1
Setup Procedure Document		None	1
Notes on using Windows Embedded Standard		None	1
Recovery Media *2		None	1

*1 It is attached to the main body.

*2 Please confirm latest information on the CONTEC homepage though the user's manual is stored in Recovery Media. The installation method is described in this document as well as the UsersManual. [File storing place: \Manual]

Product Configuration Image



* See the Product Configuration List to check if all the components are included for the specified number of units.

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Table of Contents

1. Introduction

About the Product

This product is a fanless computer for embedded applications. It features an Atom processor Z510P (BX-200, BX-200D), Z530P (BX-210, BX-210D), US15WP (GMA500) chipset. It combines sufficient performance and low power consumption in a space-saving design that can be installed in spaces only 50-mm thick with roughly the same area as a paperback book. This "resource-saving PC" helps you design more compact, energy efficient equipment to reduce running costs and promote energy efficiency.

It has extension interfaces such as 1000BASE-T, USB 2.0, and serial. It employs a CF card for storage and is fanless to ensure a totally spindleless design that simplifies maintenance.

It is available in ten different models with different CPU and display interface configurations so that you can select the best product to suit your application.

Embedded-type CPU and chip set have been adopted. The use of readily available parts ensures the ease of the use of the product. In addition, the use of Contec-customized BIOS allows support to be provided at the BIOS level.

This product is available in the following 10 models:

- Base model with Intel Atom Processor Z510P 1.10GHz
  BX-200-DC5000 (Memory 1GB, without OS, without CF, Graphic I/F: Analog RGB)
  BX-200-DC6000 (Memory 2GB, without OS, without CF, Graphic I/F: Analog RGB)
  BX-200D-DC5000 (Memory 1GB, without OS, without CF, Graphic I/F: DVI-D)
- OS-installed model with Intel Atom Processor Z510P 1.10GHz
  BX-200-DC5311 (Memory 1GB, Windows Embedded Standard 2009 (Japanese version), CF2GB, Graphic I/F: Analog RGB)
  BX-200D-DC5311 (Memory 1GB, Windows Embedded Standard 2009 (Japanese version), CF2GB, Graphic I/F: DVI-D)
- Base model with Intel Atom Processor Z530P 1.60GHz
  BX-210-DC5000 (Memory 1GB, without OS, without CF, Graphic I/F: Analog RGB)
  BX-210D-DC5000 (Memory 1GB, without OS, without CF, Graphic I/F: DVI-D)
  BX-210D-DC6000 (Memory 2GB, without OS, without CF, Graphic I/F: DVI-D)
- OS-installed model with Intel Atom Processor Z530P 1.60GHz
  BX-210-DC5311 (Memory 1GB, Windows Embedded Standard 2009 (Japanese version), CF2GB, Graphic I/F: Analog RGB)
  BX-210D-DC5311 (Memory 1GB, Windows Embedded Standard 2009 (Japanese version), CF2GB, Graphic I/F: DVI-D)

Features

- Contributing to reduction of running cost and promotion of energy efficiency

It adopts the low-power platform with Intel (R) Atom(TM) Processor Z510P (BX-200) or Z530P (BX-210), US15WP chipset that realizes lower power consumption while ensuring sufficient performance.

- Contributing to compact device design. Ultra-small PC is roughly the same area as a paperback book

It is the smallest [178 (W) x 115 (D) x 29 (H)] and lightest [800 g] PC in the series, and can be installed almost anywhere.

Can be installed in spaces only 50-mm thick with roughly the same area as a paperback book. It largely serves downsizing of your equipment, fits any area with the aesthetics kept.

- Slitless/fanless design that reduces maintenance work

This product's spindleless design eliminates the heat dissipating slit and CPU fan and adopts CF card for the storage. There is no need to worry about the intrusion of dust or foreign objects, and the use of parts that degrade over time is minimized to facilitate maintenance.

- Remote power management function to reduce operation tasks

Supports system startup by external device over network (Wake-on-LAN), by general purpose input (power on by GPI), and by modem reception (power on by ring). It encourages significant labor saving in operation.

- Major types of peripherals are supported with rich interfaces including the two CF card slots

It has a variety of extended interface such as 1000BASE-T x 2, USB2.0 x 5, serial (RS-232C) x 2.
It has two CF card slots (one built into main unit), providing the ability to separate data from the operating system, as well as the convenience of being able to use one slot for system startup and the other for maintenance or for taking home system logs or collected data.

- Falling-off prevention tools and fixing clamps provided to avoid trouble caused by disconnected cable

This product stays trouble-free, being equipped with USB removal prevention fitting and cable clamp for connectors with no locking mechanism, such as USB cable, and with hardware to properly mount and avoid falling out of CF card.

- Safety design required for embedded applications

Retention of CMOS data by EEPROM allows the system to start up even when the battery has run out. For Windows Embedded Standard installed model, it is possible to use the EWF*1 function of OS. It is designed for safety required for embedding purpose, for example, prohibiting unwanted writing to the CF card with EWF function will relieve the concern about the writing limits to the CF card and prevent an unintentional system alteration.

*1 EWF (Enhanced Write Filter) is a function specific to Windows Embedded Standard that protects the disk from being actually written by redirecting the writing to RAM.

- A wide range of power supplies (10.8 - 31.2VDC) supported

As the product supports a wide range of power (10.8 - 31.2VDC), it can be used in a variety of power environments. The separately available AC adapter adds support for 100VAC power.

Supported OS

- Windows Embedded Standard 2009

Customer Support

CONTEC provides the following support services for you to use CONTEC products more efficiently and comfortably.

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.

Caution on the BX-2x0, BX-2x0D Series

Handling Precautions

⚠ WARNING

- Always check that the power supply is turned off before connecting or disconnecting power cables.
- 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 contact your retailer.
- 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. For details on replacing the battery, refer to the appendix.

⚠ CAUTION

- Do not use or store this product in a location exposed to high or low temperature that exceeds range of specification or susceptible to rapid temperature changes.
  Example: - Exposure to direct sun
  - In the vicinity of a heat source
- Do not use this product in extremely humid or dusty locations. It is extremely dangerous to use this product with its interior penetrated by water or any other fluid or conductive dust. If this product must be used in such an environment, install it on a dust-proof control panel, for example.
- Avoid using or storing this product in locations subject to shock or vibration that exceeds range of specification.
- Do not use this product in the vicinity of devices that generate strong magnetic force or noise. Such products will cause this product to malfunction.
- Do not use or store this product in the presence of chemicals.
- To clean this product, 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.
- This product's case may become hot. To avoid being burned, do not touch that section while this 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.
- CONTEC does not provide any guarantee for the integrity of data on CF.
- Always remove the power cable from the power outlet before connecting or disconnecting a connector.
- To prevent corruption of files, always shutdown the OS before turning off this product.
- 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 your retailer.
- To connect with peripherals, use a grounded, shielded cable.
- The CF card connector doesn't support hot plug. The pulling out opening of the CF card cannot be done in the state of power supply ON. Please neither pulling out opening of CF in the state of power supply ON of this product nor come in contact with CF. This product may malfunction or cause a failure.
- If you use any other CFs than our CFs, we can not guarantee this product's specification. When you newly select CFs for this product, you should read "Chapter 6. CF selection" at first. If you select unpreferable CFs, the system may work out of order.
- Component Life:
  (1) 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.
  (2) CF ---The OS-installed model uses a CF card in the OS storage area. The predicted failure rate is 3,840,000 rewrite operations (allowable number of rewrite operations of 512KB or less) and MTBF is 500,000 hours.
  * Replacement of expendables is handled as a repair (there will be a charge).

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. System Reference

Specification

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

Model			BX-200-DCxxxx	BX-200D-DCxxxx	BX-210-DCxxxx	BX-210D-DCxxxx
CPU			Intel® Atom (TM) Processor Z510P 1.10GHz (FSB400MHz)		Intel® Atom (TM) Processor Z530P 1.60GHz (FSB533MHz)	
Chip set			Intel® US15WP			
BIOS			BIOS (mfd. by Award)			
Memory			200pin SO-DIMM socket x 1, PC2-4300 (DDR2 533) DDR2 SDRAM support BX-2x0-DC5xxx, BX-2x0D-DC5xxx: 1GB, BX-2x0-DC6xxx, BX-2x0D-DC6xxx: 2GB			
Graphic						
	Controller		Built in Intel® US15WP			
	Video RAM		Main memory shared			
	Video BIOS		64KB (C0000H-CFFFFH)			
	Display resolution (Max.)	Analog RGB	1,920x1,200@60Hz (16,770,000 colors, ReduceBlanking)	None	1,920x1,200@60Hz (16,770,000 colors, ReduceBlanking)	None
		DVI	None	1,920x1,200@60Hz (16,770,000 colors, ReduceBlanking)	None	1,920x1,200@60Hz (16,770,000 colors, ReduceBlanking)
Audio			HD Audio compliant, LINE OUT x 1, MIC IN x 1			
CF card slot			CF CARD Type I x 2 bootable			
			BX-2x0-DCx000, BX-2x0D-DCx000: none, BX-2x0-DCx311, BX-2x0D-DCx311: Built-in CF card slot contains a CF card. (2GB, 1 partition)*1			
LAN *2			Intel 82574L Controller 1000BASE-T/100BASE-TX/10BASE-T 2 port (Wake On LAN support)			
USB			USB 2.0 compliant 6 port			
Serial I/F			RS-232C (general-purpose) 2 port, Baud rate : 50 - 115,200bps RS-232C (For touch panel communication) 1 port RS-422/485 (general-purpose) 1 port, Baud rate : 50 - 115,200bps			
RAS			WDT: Software programmable, 1sec - 255sec (Time up allows reset, interrupt, or external output.), Remote reset: Input signal from external device			
General-purpose I/O			Photocoupler insulation inputs/outputs (3 of each) (One output used for WDT external output, one input switched between remote reset or remote power on.)			
Hardware monitoring			Monitoring CPU temperature, power voltage			
RTC/CMOS			Lithium backup battery life: 10 years or more. The real-time clock is accurate within ±3 minutes (at 25°C) per month (US15WP integrated RTC).			
Power Management			Power management setup via BIOS, Power On by Ring / Wake On LAN, Supports PC98/PC99 ACPI Power management			

*1: The capacity of CF is a value when 1GB is calculated by 1 billion bytes. The capacity that can be recognized from OS might be displayed fewer than an actual value.

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

Model	BX-200-DCxxxx	BX-200D-DCxxxx	BX-210-DCxxxx	BX-210D-DCxxxx
Interface				
Display	1 port (15 pin HD-SUB connector [Analog RGB] x 1)	1 port (24 pin connector [DVI-D] x 1)	1 port (15 pin HD-SUB connector [Analog RGB] x 1)	1 port (24 pin connector [DVI-D] x 1)
Audio	LINE OUT: ϕ3.5 Stereo mini jack, Full-scale output level 1.2Vrms (Typ.), Dual 60mW Amplifier MIC IN: ϕ3.5 Stereo mini jack, Full-scale input level 1.6Vrms (Typ.)			
CF card slot	2 solt (CF1/CF2), CF CARD Type I x 2, bootable BX-2x0-DCx000, BX-2x0D-DCx000: none, BX-2x0-DCx311, BX-2x0D-DCx311: Built-in CF card slot contains a CF card. (2GB, 1 partition)*1			
LAN *2	2 port (RJ-45 connector)			
USB	6 port (host: TYPE-A connector x 5, target: miniTYPE-AB connector x 1)			
RS-232C	2 port (9 pin D-SUB connector [male])			
RS-422/485/ General-purpose I/O / RAS	1 port (15 pin D-SUB connector [female])			
Power supply				
Rated input voltage	12 - 24VDC *3			
Range of input voltage	10.8 - 31.2VDC			
Power consumption	12V 3.2A, 24V 1.7A			
External device power supply capacity	CF card slot: +3.3V 1A (500mA x 2) USB I/F: +5V : 2.5A (500mA x 5)			
Physical dimensions (mm)	178 (W) x 115(D) x 29(H) (No protrusions)			
Weight	About 0.8kg (Excluding attachment fittings)			

*2: If you use the 1000BASE-T, be careful of the operating temperature.
For more details on this, refer to chapter3, Installation Requirements.

*3: Use a power cable shorter than 3m.

Table 2.2. Installation Environment Requirements

Model			BX-2x0-DCxxxx, BX-2x0D-DCxxxx
Ambient specifications	Operating temperature *4		0 - 50°C (When using 1000BASE-T : 0 - 45°C) *4
	Storage temperature		-10 - 60°C
	Humidity		10 - 90%RH (No condensation)
	Floating dust particles		Not to be excessive
	Corrosive gases		None
	Line-noise resistance	Line noise	AC line / ±2kV *5, Signal line / ±1kV (IEC61000-4-4 Level 3, EN61000-4-4 Level 3)
		Static electricity resistance	Contact discharge / ±4kV (IEC61000-4-2 Level 2, EN61000-4-2 Level 2) Atmospheric discharge / ±8kV (IEC61000-4-2 Level 3, EN61000-4-2 Level 3)
	Vibration resistance	Sweep resistance	10 - 57Hz/semi-amplitude 0.375 mm 57 - 500Hz/5.0G 60 min. each in x, y, and z directions (JIS C0040-compliant, IEC68-2-6-compliant)
	Impact resistance		100G, half-sine shock for 6 ms in x, y, and z directions (JIS C0041-compliant, IEC68-2-27-compliant)
	Grounding		Class D grounding, SG-FG / continuity

*4 : For more details on this, please refer to chapter 3, “Installation Requirements”.

*5 : When AC adapter “IPC-ACAP12-04” is used.

Power Management Features

- Support both ACPI (Advanced Configuration and Power Interface) and legacy (APM) power management.
- ACPI v2.0 compliant
- APM v1.2 compliant
- Hardware automatic wake-up

Power Requirements

Your system requires a clean, steady power source for reliable performance of the high frequency CPU on the product, the quality of the power supply is even more important. For the best performance makes sure your power supply provides a range of 10.8 V minimum to 31.2 V maximum DC power source.

Power Consumption

For typical configurations, the CPU card is designed to operate with at least a 60W power supply. The power supply must meet the following requirements:

- Rise time for power supply: 2 ms - 30 ms

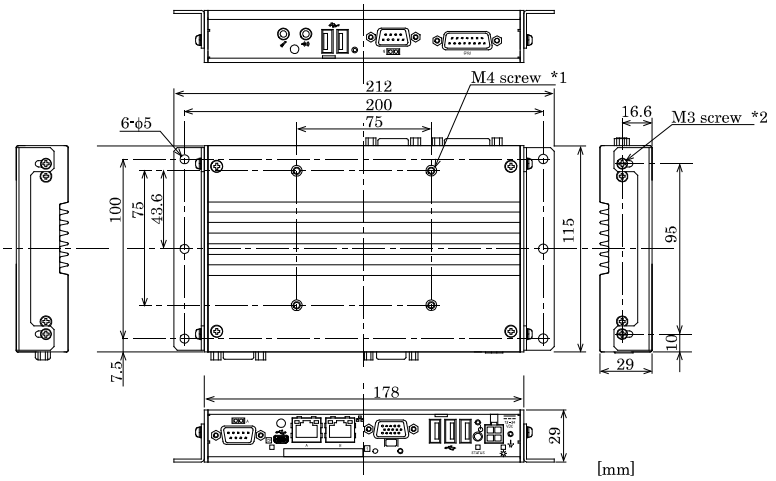
The following table lists the power supply's tolerances for DC voltages:

Table 2.3. DC voltage tolerance

DC Voltage	Acceptable Tolerance
+ 12V - 24V	+ 10.8V - 31.2V

Physical Dimensions

BX-2x0-DCxxxx

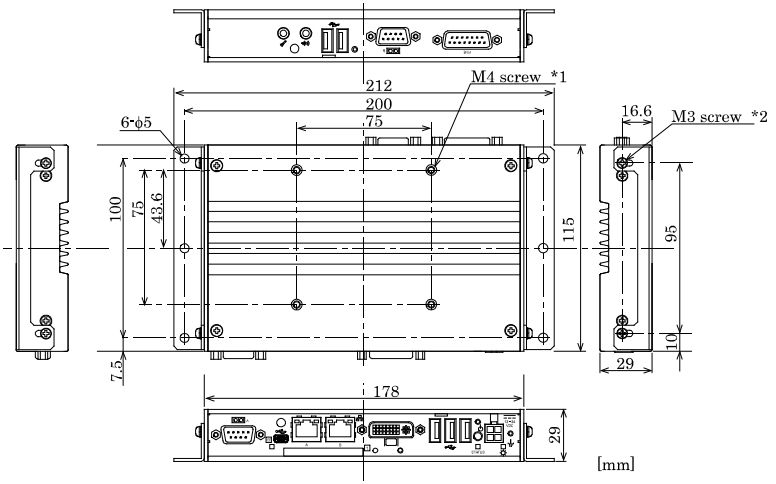


*1 : The length (L) from the surface of the cabinet to the screw tip should be 8mm or less.

*2 : When you fasten the bundled attachment fittings to be fixed to the body, you should use the attached screws (M3 x 6). Otherwise, the length (L) from the surface of the cabinet to the screw tip should be 4mm or less.

Figure 2.1. BX-2x0-DCxxxx

BX-2x0D-DCxxxx



*1 : The length (L) from the surface of the cabinet to the screw tip should be 8mm or less.

*2 : When you fasten the bundled attachment fittings to be fixed to the body, you should use the attached screws (M3 x 6). Otherwise, the length (L) from the surface of the cabinet to the screw tip should be 4mm or less.

Figure 2.1. BX-2x0D-DCxxxx

3. Hardware Setup

Before Using the Product for the First Time

Follow the next steps to set up this product :

STEP1 By referring to the information in this chapter, install, connect and set this product.

STEP2 Connect cables.
Connect the cable of necessary external devices, such as keyboard and a display, to this product 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 find any abnormality after turning on the power, turn it off and check to see if the setup has been performed properly.

STEP4 Set up BIOS.
By referring to Chapter 5, set up BIOS. This setup requires a keyboard and a display.

* Before using this product, be sure to execute " LOAD SETUP DEFAULTS" to initialize the BIOS settings to their default values.
(See Chapter 5, "Main Menu.")

⚠ CAUTION

Be sure to connect the keyboard and mouse to it before turning the power on for the first time.

Hardware Setup

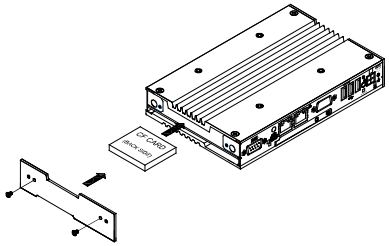
- Before you start, be sure that the power is turned off.
- Remove only those screws that are explained. Do not move any other screw.

Inserting an Embedded CF Card

One CF card (Type I) can be embedded. BX-2x0-DCx311 and BX-2x0D-DCx311 come with CF cards with the OS already installed.

(1) Detach the side panel and insert the CF card.

(2) Reattach the side panel and tighten the screws to secure it.



The specified tightening torque is 5 - 6 kgf·cm.

Figure 3.1. Inserting an Embedded CF Card

Attaching the CF Attachment Fittings

(1) After inserting a CF Card, fasten the bundled CF attachment fittings with a screw.

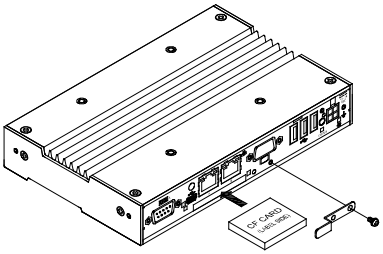


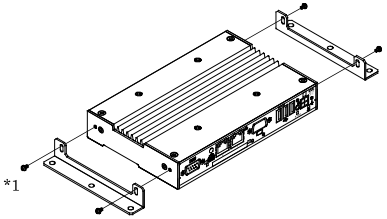
Figure 3.2. Attaching the CF Attachment Fittings

⚠ CAUTION

- Insert the CF Card face up.
- Screw holes may be damaged if screws are tightened with a torque greater than the specified torque.The specified tightening torque is 5 - 6 kgf·cm.

Attaching the Attachment Fittings

(1) Use screws to attach the bundled attachment fittings with a screw.
Do not tighten screws with excess force.



*1 Attached screw (M3 x 6)

Figure 3.3. Attaching the Attachment Fittings

⚠ CAUTION

Screw holes may be damaged if screws are tightened with a torque greater than the specified torque.
The specified tightening torque is 5 - 6kgf·cm.

Attaching the FG

(1) Use screws to attach the FG.

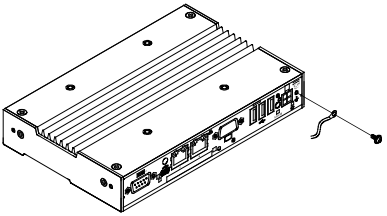


Figure 3.4. Attaching the FG

⚠ CAUTION

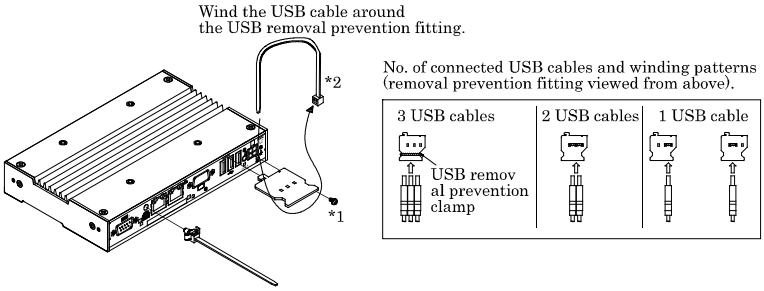
The FG pin of this product is connected to the GND signal of the DC power connector (DC-IN).
Note that the connection cannot be cut off.
Screw holes may be damaged if screws are tightened with a torque greater than the specified torque.The specified tightening torque is 5 - 6kgf·cm.

Fastening the Cable

This product comes with clamps for fixing cables.

Fastening the LINEOUT, USB Cable

(1) The system unit has a hole for attaching cable clamp to USB removal prevention fitting. Using a cable clamp for a cable with lock-less connector, such as the LINEOUT and USB Cable, prevents the connector from being unplugged. Use the cable ties and cable clamps appropriately according to the connecting states and wiring directions of cables.



*1 Attached screw (M3 x 6)

*2 Attached USB removal prevention clamp.

Figure 3.5. Attaching the cable clamp

(2) The photo below shows an example of using a cable clamp. Fix the cable with a clamp without applying stress to the connector.

Figure 3.6. Using example of cable clamp

Installation Requirements

There are limits to the ambient temperature range depending on the installation orientation.

Be sure that the operating temperature is within the range specified in the installation environment requirement by making space between the product and device that generates heat or exhaust air.

Installable directions at operating temperature 0 - +50°C: (1), (2), (3), (4), (5)
(When using 1000BASE-T: 0 - +45°C)

Installable directions at operating temperature 0 - +45°C (6), (7), (8)
(When using 1000BASE-T: 0 - +40°C)

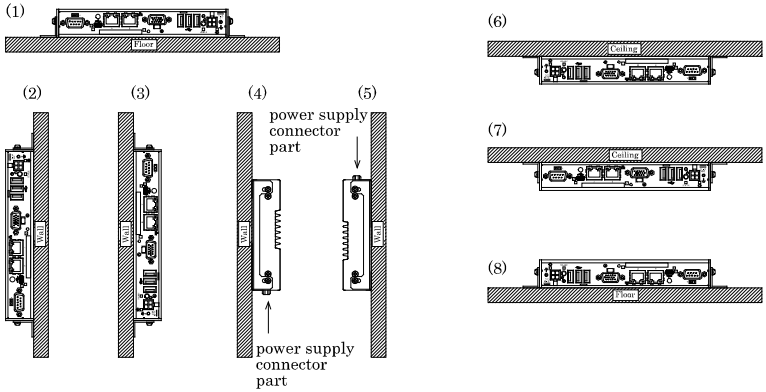


Figure 3.7. Installation Orientation (BX-2x0-DCxxxx, BX-2x0D-DCxxxx)

⚠ CAUTION

Note that even though the ambient temperature is within the specified range, an operational malfunction may occur if there is other device generating high heat; the radiation will influence the product to increase its temperature.

Distances between this product and its vicinity

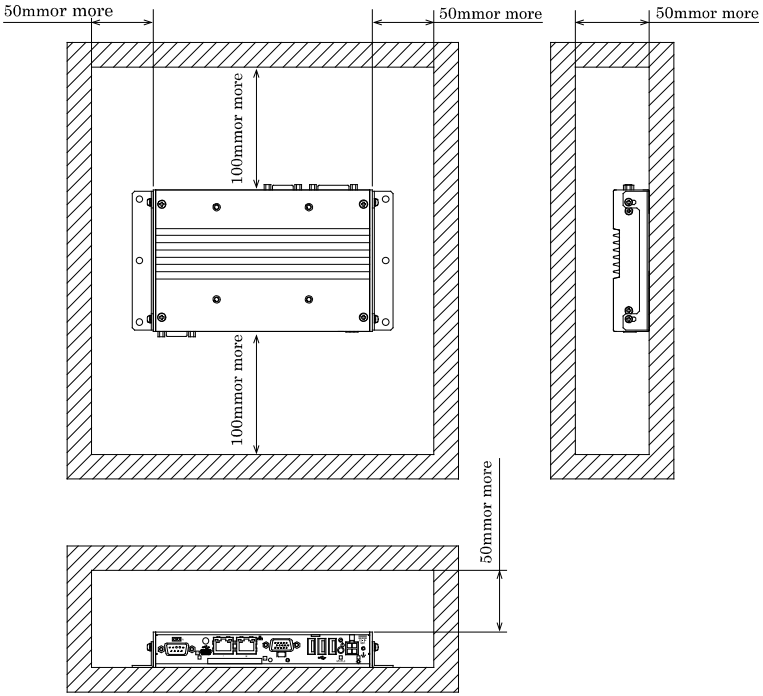


Figure 3.8. Distances between this product and its vicinity

⚠ CAUTION

Do not install this product in completely sealed spaces, except when it is possible to adjust the internal temperature using an air conditioner or similar equipment. Temperature increase caused by long-term usage may result in operational malfunction or other problems.

Operating temperature

In this product, the operating temperature is decided from the multiple measurement points as shown below. When making use of the product, the air current should be adjusted to prevent that all the temperatures measured at the measurement points exceed the specified temperature.

< Vertical installation >

⊗measurement points

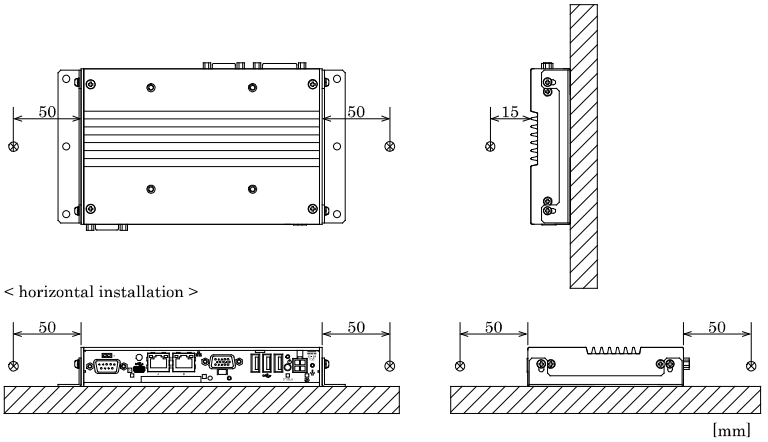


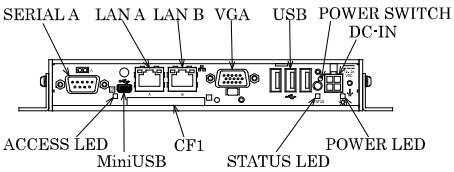
Figure 3.9. Operating temperature

4. Each Component Function

Component Name

Front View

BX-2x0-DCxxxx



BX-2x0D-DCxxxx

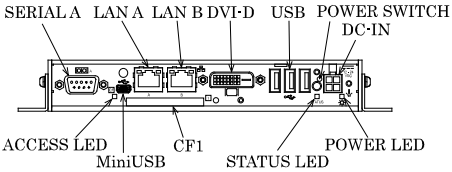


Figure 4.1. Component Name ***< 1 / 2 >***

Rear View

BX-2x0-DCxxxx, BX-2x0D-DCxxxx

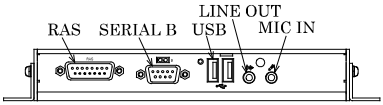


Figure 4.1. Component Name ***< 2 / 2 >***

Table 4.1. Component Function

Name	Function
POWER LED	Power ON display LED
STATUS LED	Status LED
ACCESS LED	CF disk access display LED
DC-IN	DC power input connector
POWER-SW	Power switch
USB TYPE-A	USB port TYPE-A connector x 5
miniUSB TYPE-AB	miniUSB port TYPE-AB connector x 1
A-RGB(BX-2x0 model)	Display (15 pin D-sub, female)
DVI-D(BX-2x0D model)	Display (24 pin, female)
LAN A	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector
LAN B	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector
SERIAL A	Serial port A connector (9pin D-SUB, male)
SERIAL B	Serial port B connector (9pin D-SUB, male)
CF1	CF card slot (IDE connection mastering)
CF2	CF card slot (IDE connection slaving)
MIC IN	Mike in (ϕ3.5 PHONE JACK)
LINE OUT	Line out (ϕ3.5 PHONE JACK)
RAS	RAS function and RS-485 connector (15 pinD-SUB, female)

System Configuration

BX-2x0-DCxxxx, BX-2x0D-DCxxxx

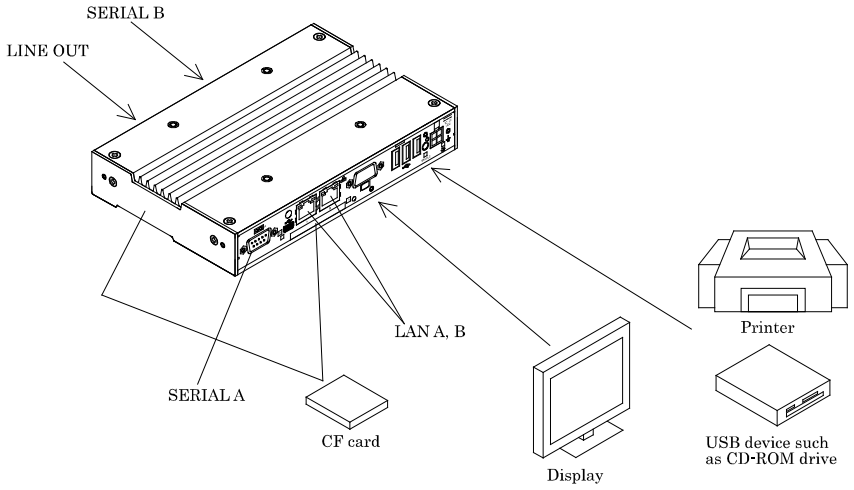


Figure 4.2. System Configuration

Component Function

LED: POWER, ACCESS, STATUS

There are 3 LED in front of this product.

Table 4.2. Display Contents of LED

LED name	State	Display contents
POWER LED	OFF	Indicates that this product is switched off.
	ON (Green)	Indicates that this product is switched on.
ACCESS LED	ON (Orange)	Indicates that the IDE device is being accessed.
STATUS LED	OFF	You can control the behavior of LED from the user application. *1
	ON (Red)	You can control the behavior of LED from the user application. *1

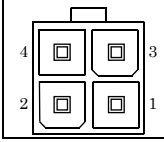
*1 API that controls STATUS LED is available. See the API description file "mtdll_e.chm" included in /RasUtility/Samples in the CONTEC's Web site [IPC-SLIB-01] for details.

DC Power Input Connector: DC-IN

To supply the power, always use the power supply listed below.

Rated input voltage : 12 - 24VDC
Range of input voltage : 10.8 - 31.2VDC
Power capacity : 12V 3.3A or more, 24V 1.7A or more

Table 4.3. DC Power Connector

Connector type	9360-04P (mfd. by ALEX)	
	Pin No.	Signal name
	1	GND
	2	GND
	3	12 - 24V
	4	12 - 24V

Applicable connector on the connector side

Housing : 9357-04 (mfd. by ALEX) or 5557-04R (mfd. by MOLEX)
Contact : 4256T2-LF (AWG18-24) (mfd. by ALEX) or 5556 (AWG18-24) (mfd. by MOLEX)

Rise time of power supply

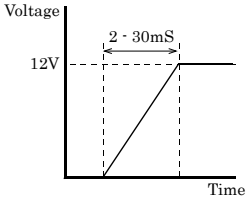


Figure 4.3. Graph of Rise Time of Power Supply

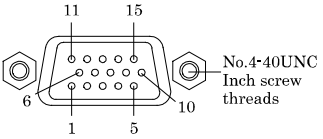
POWER SW

POWER SW is provided.

Analog RGB Interface: A-RGB (BX-2x0 model)

Has a connector for connecting a display. The connector is named A-RGB (HD-SUB 15P).

Table 4.4. A-RGB Connector

Connector type	15 pin HD-SUB (FEMALE)		
			
Pin No.	Signal name	Pin No.	Signal name
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	DDCDATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDCCLK
8	GND		

For the LCDs that can be connected, please refer to “Chapter 7 List of Options”.

Display driver

Install the appropriate audio driver for your OS from the bundled CD-ROM [IPC-SLIB-01].
(For information on the latest version of IPC-SLIB-01, check the CONTEC's web site.)

⚠ CAUTION

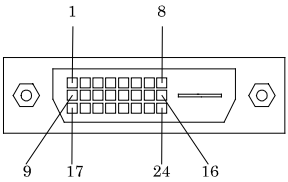
When the analog display is used, Windows MS-DOS may not be properly displayed in full-screen mode.
This is because the frequency and resolution of Windows and MS-DOS (full-screen display) are the same due to the screen settings while the display parameters are different.
For display, as only one parameter can be stored for one frequency or resolution, only either of Windows or MS-DOS screen can be displayed properly.
In this case, change the resolution or display frequency of Windows so that it is not the same as for the MS-DOS display.

DVI-D Interface: DVI-D (BX-2x0D model)

A DVI-D interface is provided. A CONTEC flat panel display can be connected. The connector is named DVI-D (DVI-D 24-pin).

Table 4.5. DVI-D Connector

Connector type	DVI-D 24 pin



Pin No.	Signal name	Pin No.	Signal name
1	DATA2-	13	N.C.
2	DATA2+	14	+5V
3	DATA2 SHIELD	15	GND
4	N.C.	16	HPD
5	N.C.	17	DATA0-
6	DDC CLK	18	DATA0+
7	DDC DATA	19	DATA0 SHIELD
8	N.C.	20	TXD
9	DATA1-	21	RXD
10	DATA1+	22	CLK SHIELD
11	DATA1 SHIELD	23	CLK+
12	N.C.	24	CLK-

Display driver

Install the appropriate audio driver for your OS from the CONTEC's Web site [IPC-SLIB-01].
(For information on the latest version of IPC-SLIB-01, check the CONTEC's Web site.)

⚠ CAUTION

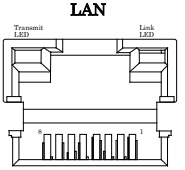
- You need to set the screen resolution if the display cable is not connected to this DVI-D interface at OS startup, but connected after OS startup (hereinafter referred to as "Late Insertion"). For more details on this, refer to the CONTEC's Web site [IPC-SLIB-01].
- When using the DVI interface, resolution 640 x 480 may not be displayed normally. To display it normally, you need to set the screen resolution. For more details on the setting method, refer to the CONTEC's Web site [IPC-SLIB-01].

Giga bit-Ethernet: LAN A, B

This product is equipped with 2 ports for giga bit.

- Network type : 1000BASE-T/100BASE-TX/10BASE-T
- Transmission speed : 1000M/100M/10M bps
- Max. network path length : 100m/segment
- Controller : Intel 82574L

Table 4.6. Giga bit-Ethernet Connector



Pin No.	Function	
	100BASE-TX	1000BASE-T
1	TX+	TRD+(0)
2	TX-	TRD-(0)
3	RX+	TRD+(1)
4	N.C.	TRD+(2)
5	N.C.	TRD-(2)
6	RX-	TRD-(1)
7	N.C.	TRD+(3)
8	N.C.	TRD-(3)

LEDs for display of network statuses:

Right LED : Link LED
Normal connection : Green ON, Operation: Green Blinking
Left LED : Operation LED
10M: Off, 100M: Green, 1000M: Orange

LAN drivers

Install the appropriate audio driver for your OS from the CONTEC's Web site [IPC-SLIB-01].
(For information on the latest version of IPC-SLIB-01, check the CONTEC's web site.)

⚠ CAUTION

Attention should to be paid to the guaranteed operating range of temperature in using 1000BASE-T. For more details on this, refer to chapter3, Installation Requirements. Note that the Ethernet should be configured as 100BASE-TX or 10BASE-T in using under the temperature 0 - 50°C.

Serial Port Interface: SERIAL A, B

SERIAL A, B (RS-232C Ports)

The product has 2 channels of RS-232C compliant serial ports supporting up to a baud rate of 115,200bps with a 16-byte transmission-dedicated data buffer and a 16-byte reception-dedicated data buffer. You can use “Chapter 5 BIOS Setup” 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.)
Please refer to “Chapter 6 I/O Port Addresses” for more information on I/O address and register function.

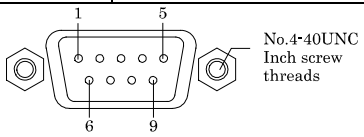
Table 4.7. SERIAL A, B, C, D, E I/O Addresses and Interrupts

SERIAL	I/O address	Interrupt
1	3F8h - 3FFh	IRQ 4
2	2F8h - 2FFh	IRQ 3
TPSerial*1	2A7h-2AFh	IRQ5
RS485/422*2	2B0h-2B7h	IRQ6

*1 Set as Disable when shipped. Not available since it is for the reserved device for the functional expansion in future. The I/O address is fixed and can not be changed.

*2 Settings are fixed and cannot be changed.

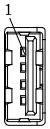
Table 4.8. Serial Port Connector

Connector type	9-pin D-SUB (MALE)		
			
Pin No.	Signal name	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

USB Ports TYPE-A:USB TYPE-A

This product is equipped with 5 channels for USB 2.0 interface.

Table 4.9. USB Connector TYPE-A

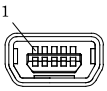


Pin No.	Function
1	USB_VCC
2	USB-
3	USB+
4	USB_GND

miniUSB Ports TYPE-AB:miniUSB TYPE-AB

This product is equipped with 1 channel for USB 2.0 TYPE-AB interface.

Table 4.10. USB Connector TYPE-B



Pin No.	Function
1	USB_VCC
2	USB-
3	USB+
4	USB_GND

Using the miniUSB port

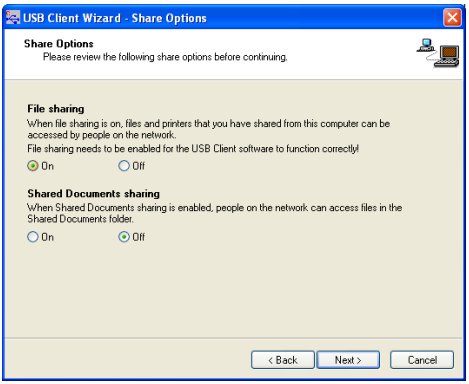
Implementing the following procedure lets you use a shared folder on this product in the same way as a network drive when this product is connected to another PC via USB.

As when sharing other network resources, the connecting user must be given access permission for the shared folder and a password must be set.

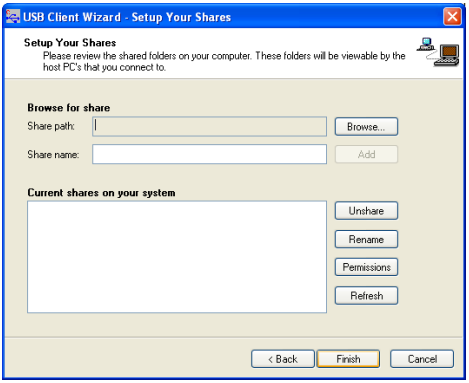
(1) Select the icon below on this product to start the Intel® USBC Client Utility.

(2) The window below is displayed. Select [Next].

(3) When the window below is displayed, under "File sharing" select the "On" option.

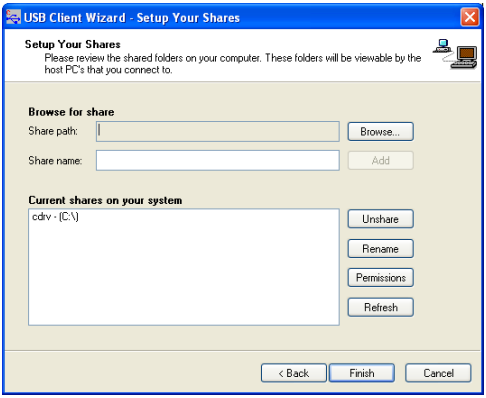


(4) When the window below is displayed, select the shared folder you want to use and configure it.



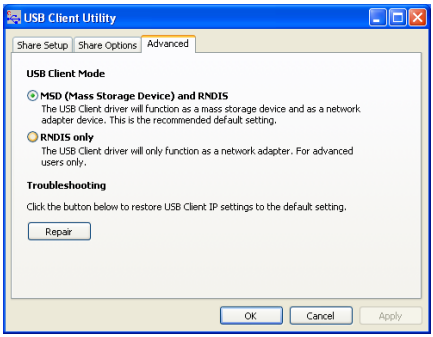
Complete the "Share path" and "Share name" fields, and click [Add] to add the folder to the list of current shares on your system.

The window below shows an example setting.



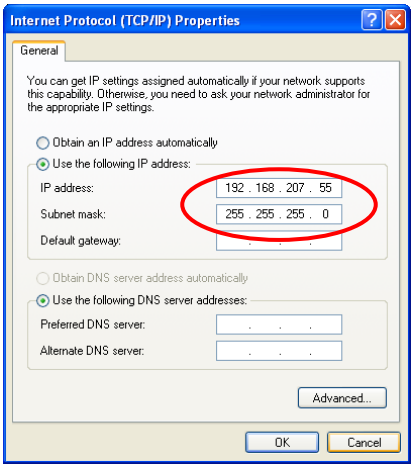
(5) Click [Finish] to exit the utility.

(6) Launch the utility again, and select the "Advanced" tab.



As shown in the window above, the "MSD (Mass Storage Device) and RNDIS" option is selected. Change this so that "RNDIS only" option is selected.
Note: If the "MSD (Mass Storage Device) and RNDIS" option is selected, this product will not operate correctly.

(7) Exit the utility, and from Network Connections, select the newly added local area connection, and display the "Internet Protocol (TCP/IP) Properties".

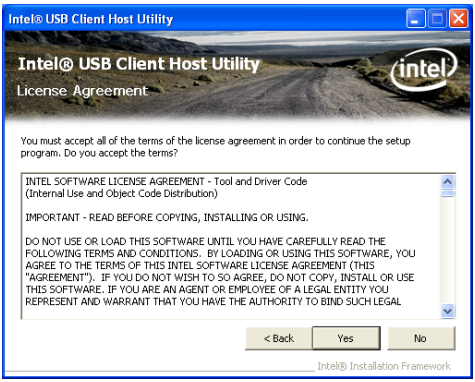


Check the displayed IP address and subnet mask, and edit them if necessary. These values are required when to configure the host PC.

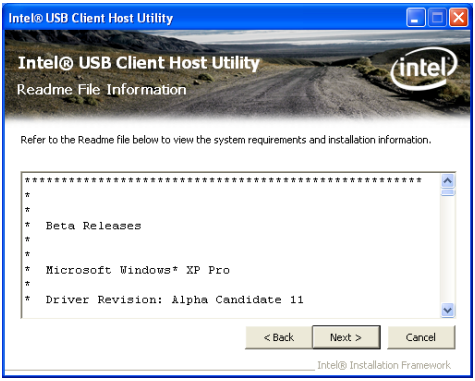
(8) Next, install the Intel® USB Client Host Utility on the PC that you want to connect to.
The setup files for the utility are included in IPC-SLIB-01.
(For the latest version of IPC-SLIB-01, visit the CONTEC website.)
Note: Do not connect the USB cable to this product at this stage.

(9) When the window below is displayed, click [Next] to proceed.

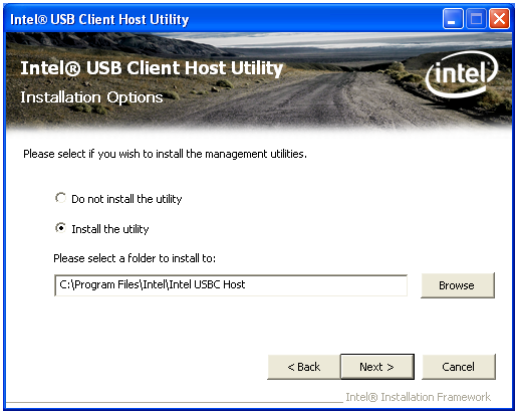
(10) When the window below is displayed, read the license agreement and click [Yes] to accept the terms.



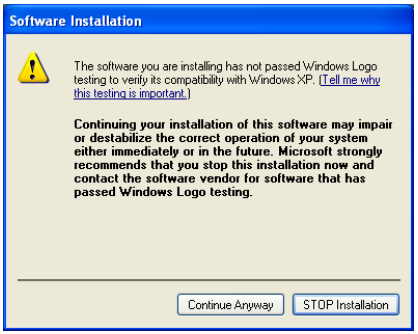
(11) Read the installation information and confirm that your PC meets the system requirements.



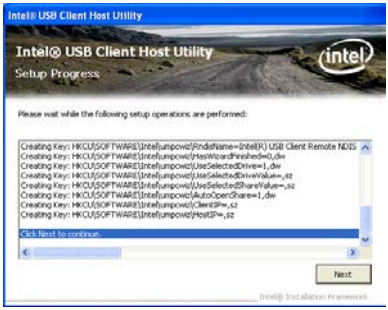
(12) When the window below is displayed, select "Install the utility", confirm the installation directory, and then select [Next].



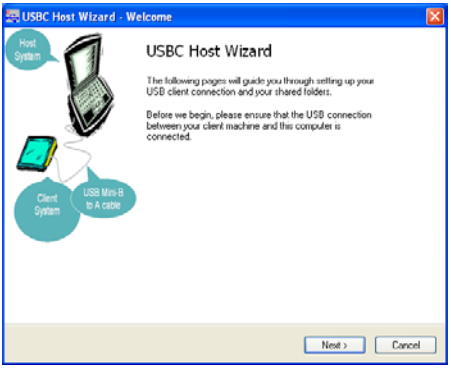
(13) If the window below is displayed during the installation, select [Continue Anyway].



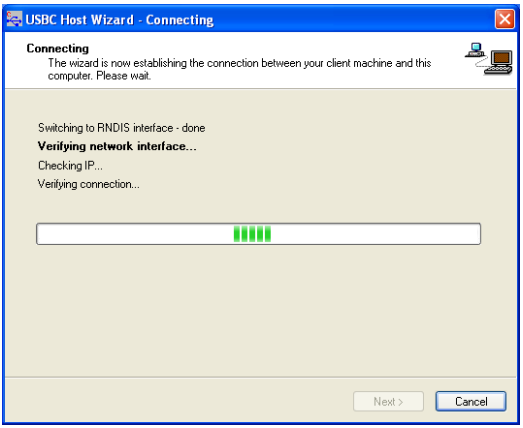
(14) When the installation finishes, the windows below are displayed. Select [Next] and then [Finish] to complete the installation.



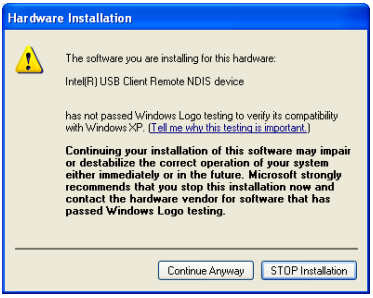
(15) Next, launch the utility to configure it. When the window below is displayed, prepare to connect this product to the PC using the USB cable, and click [Next].



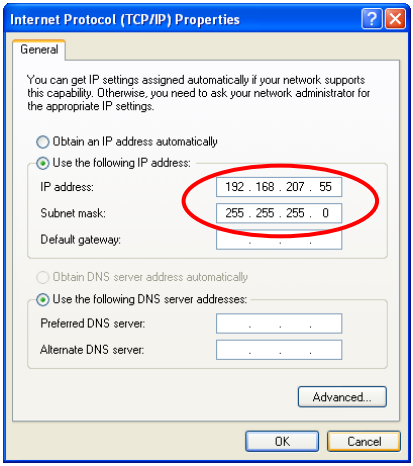
(16) The window below is displayed. Connect this product to the PC using the USB cable.



(17) If the window below is displayed, click [Next].



(18) Once the installation is finished, from Network Connections, select the newly added local area connection, and display the "Internet Protocol (TCP/IP) Properties".



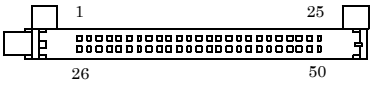
Check that the PC is on the same subnet as this product. Change the values if they are different.

(19) It is now possible to use shares on this product as network drives.

CF Card Connector (Primary IDE Connection) : CF1 - 2

The CF Card (Type I : dedicated to the memory card) can be connected.
The CF card connector doesn't support hot plug. The pulling out opening of the CF card cannot be done in the state of power supply ON. Please neither pulling out opening of CF in the state of power supply ON of this product nor come in contact with CF. This product may malfunction or cause a failure.
Before you insert/remove the CF card, make sure that the power is switched off and the access LED is turned off.

Table 4.11. CF Card Connector

Connector type	50-socket header type (1.27mm pitch)				
					
Pin No.	Signal name	Direction	Pin No.	Signal name	Direction
1	GND		26	GND	
2	DD3	I/O	27	DD11	I/O
3	DD4	I/O	28	DD12	I/O
4	DD5	I/O	29	DD13	I/O
5	DD6	I/O	30	DD14	I/O
6	DD7	I/O	31	DD15	I/O
7	CS0-	Output	32	CD3-	Output
8	GND		33	GND	
9	GND		34	DIOR-	Output
10	GND		35	DIOW-	Output
11	GND		36	+3.3V	
12	GND		37	INTRQ	Input
13	+3.3V		38	+3.3V	
14	GND		39	CSEL-	Output
15	GND		40	N.C	
16	GND		41	RESET-	Output
17	GND		42	IOCHRDY	Input
18	DA2	Output	43	DDRQ	Input
19	DA1	Output	44	DDACK-	Output
20	DA0	Output	45	DACT-	Output
21	DD0	I/O	46	PDIAG-	Output
22	DD1	I/O	47	DD8	I/O
23	DD2	I/O	48	DD9	I/O
24	N.C		49	DD10	I/O
25	GND		50	GND	

Line out Interface: LINE OUT

A line output connector is provided. You can plug a headphone or amplifier-integrated speakers into this connector.

Mike in Interface: MIC

A MIC input connector is provided. You can plug a microphone to this connector for sound input.

Audio driver

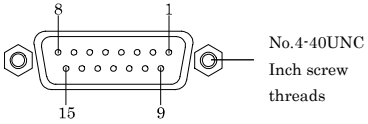
The audio driver is required to use the microphone input and line output interfaces.

Install the appropriate audio driver for your OS from the CONTEC's Web site CD-ROM [IPC-SLIB-01]. (For information on the latest version of IPC-SLIB-01, check the CONTEC's Web site.)

RAS Functions

A RAS port is provided for this product. This port offers watchdog timer, remote reset, and general-purpose I/O RAS functions.

Table 4.12. RAS Connector

Connector type	15 pin D-SUB (FEMALE)	
		
Pin No.	Signal name	Function
1	---	None
9	GND	A signal 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 watch dog timer alarm output
5	PO0	General-purpose output
13	PO1	
6	NCOM	General-purpose output minus common
7	P11	General-purpose input
14	P12/IRQ	General-purpose input or interrupt input
8	PCOM	General-purpose input plus common
15	P10	General-purpose input

⚠ 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.

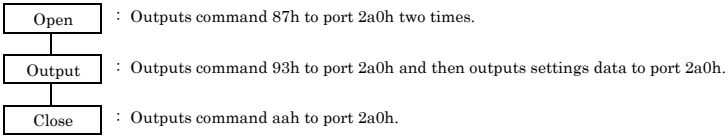
Controlling RS-485 communication

I/O ports use address 2a0/2a4h.

This section gives examples of flowcharts and programming related to switching enable signals for transmission/reception.

Terminating resistor on/off settings are performed from the BIOS setup screen. Refer to Chapter 5, "BIOS Setup", and adjust settings as necessary.

(1) Example flowchart



(2) Example programming

The following example is written in Intel 8086 assembly language.
The utility in IPC-SLIB-01 allows you to use this language in Windows.
(For the latest version of IPC-SLIB-01, visit the CONTEC website.)

```
;-----------------------------------------------
;Open
;-----------------------------------------------
CHK_OPEN1:
   MOV      DX,2A4H
   IN       AL,DX
   TEST     AL,2                ;Check status of output
   JNZ      CHK_OPEN1

   MOV      DX,2A0H
   MOV      AL,87H              ;Open Command
   OUT      DX,AL
CHK_OPEN2:
   MOV      DX,2A4H
   IN       AL,DX
   TEST     AL,2                ;Check status of output
   JNZ      CHK_OPEN2

   MOV      DX,2A0H
   MOV      AL,87H              ;Open Command
   OUT      DX,AL
CHK_OPEN3:                      ;Check status of input
   MOV      DX,2A4H
   IN       AL,DX
   TEST     AL,1
   JZ       CHK_OPEN3

   MOV      DX,2A0H
   IN       AL,DX               ;Open success if AL = AAH
;-----------------------------------------------
;Set TX/RX
```

```
;-------------------------------------------
CHK_CMD:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                ;Check status of output
   JNZ     CHK_CMD
   MOV     DX,2A0H
   MOV     AL,93H              ;Set 485 Command
   OUT     DX,AL
CHK_DATA:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL, 2               ;Check status of output
   JZ      CHK_DATA
   MOV     DX,2A0H
   MOV     AL, 0               ;Bit0: 0 Receiver Disable, 1 Receiver Enable
                               ;Bit1: 0 Transmitter Disable, 1 Transmitter Enable
CHK_STA:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,1                ;Check status of input
   JZ      CHK_STA
   MOV     DX,2A0H
   IN      AL,DX               ;Command success if AL = 93H
;-------------------------------------------
;Close
;-------------------------------------------
CHK_CLOSE1:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                ;Check status of output
   JNZ     CHK_CLOSE1
   MOV     DX,2A0H
   MOV     AL,AAH              ;Close Command
   OUT     DX,AL
CHK_CLOSE2:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,1                ;Check status of input
   JZ      CHK_CLOSE2
   MOV     DX,02A0H
   IN      AL,DX               ;Close success if AL = 55H
```

Connection methods

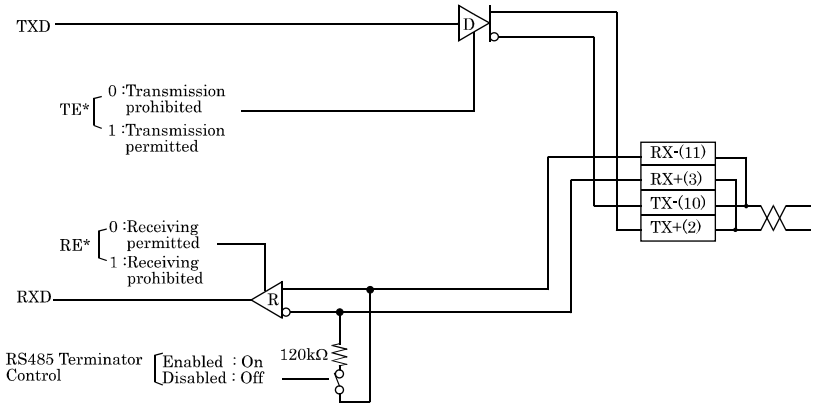


Figure 4.4. Half-Duplex Connection Method

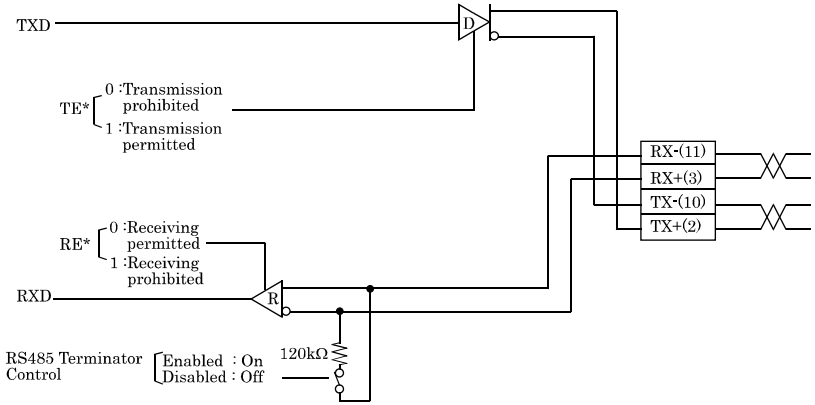


Figure 4.5. Full-Duplex Connection Method

* RE and TE respectively indicate Bit0 and Bit1 settings data in the sample program.

General Purpose Input/Output and Remote Power On/Reset

This product is equipped with three general purpose insulation-type inputs and outputs. Inputs can be used as remote power on and remote reset inputs.

It is necessary to configure BIOS settings to use an input signal as a remote power on or remote reset signal.

For details on configuring settings, refer to "Integrated Peripherals" in Chapter 5, "BIOS Setup."

Specifications

[Input]

- Input specifications : Current-driven input by photocoupler insulation.
- 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]

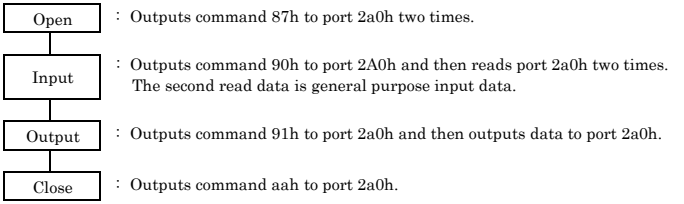
- Output specifications : Open-collector output by photocoupler insulation
- Output rating : Max. 30VDC, 100mA
- Output signal count : 3 [One of them can be used for WDT alarm output. (bit2<fixed>)]
- Output response time : Less than 300μsec

Usage

I/O ports use address 2a0/2a4h.

This section gives examples of flowcharts and programming related to using general purpose input and output.

(1) Example flowchar



(2) Example programming

The following example is written in Intel 8086 assembly language.
The utility in IPC-SLIB-01 allows you to use this language in Windows.
(For the latest version of IPC-SLIB-01, visit the CONTEC website.)

```
;---------------------------------------------
;Open
;---------------------------------------------
CHK_OPEN1:
   MOV      DX,2A4H
   IN       AL,DX
   TEST     AL,2                ;Check status of output
   JNZ      CHK_OPEN1
   MOV      DX,2A0H
   MOV      AL,87H              ;Open Command
   OUT      DX,AL
CHK_OPEN2:
   MOV      DX,2A4H
   IN       AL,DX
   TEST     AL,2                ;Check status of output
   JNZ      CHK_OPEN2
   MOV      DX,2A0H
   MOV      AL,87H              ;Open Command
   OUT      DX,AL
CHK_OPEN3:                      ;Check status of input
   MOV      DX,2A4H
   IN       AL,DX
   TEST     AL,1
   JZ       CHK_OPEN3
   MOV      DX,2A0H
   IN       AL,DX               ;Open success if AL = AAH
;---------------------------------------------
;Digital Input
;---------------------------------------------
CHK_DI1:
   MOV      DX,2A4H
   IN       AL,DX
   TEST     AL,2                ;Check status of output
   JNZ      CHK_DI1
   MOV      DX,2A0H
   MOV      AL,90H              ;Read DIO Command
   OUT      DX,AL
CHK_DI2:
   MOV      DX,2A4H
   IN       AL,DX
   TEST     AL,1                ;Check status of input
   JZ       CHK_DI2
```

```
   MOV     DX,2A0H
   IN      AL,DX                ;Command success if AL = 90H
CHK_DI3:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,1                 ;Check status of input
   JZ      CHK_DI3
   MOV     DX,2A0H
   IN      AL,DX                ;AL is DI data(3bit LSB)
;---------------------------------------------
;Digital Output
;---------------------------------------------
CHK_DO1:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                 ;Check status of output
   JNZ     CHK_DO1
   MOV     DX,2A0H
   MOV     AL,91H               ;Write DIO Command
   OUT     DX,AL
CHK_DO2:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                 ;Check status of output
   JNZ     CHK_DO2
   MOV     DX,2A0H
   MOV     AL,07H               ;DO Output Data (Example: 07H)
   OUT     DX,AL
CHK_DO3:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,1                 ;Check status of input
   JZ      CHK_DO3
   MOV     DX,2A0H
   IN      AL,DX                ;Command success if AL = 91H
;---------------------------------------------
;Close
;---------------------------------------------
CHK_CLOSE1:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                 ;Check status of output
   JNZ     CHK_CLOSE1
   MOV     DX,2A0H
   MOV     AL,AAH               ;Close Command
   OUT     DX,AL
```

```
CHK_CLOSE2:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,1                ;Check status of input
   JZ      CHK_CLOSE2
   MOV     DX,02A0H
   IN      AL,DX               ;Close success if AL = 55H
```

External I/O Circuit

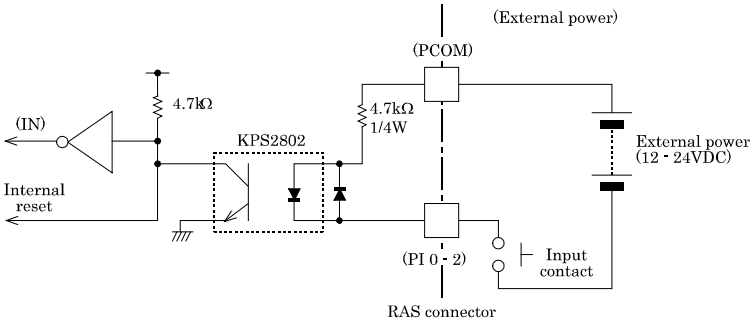


Figure 4.6. Input Circuit

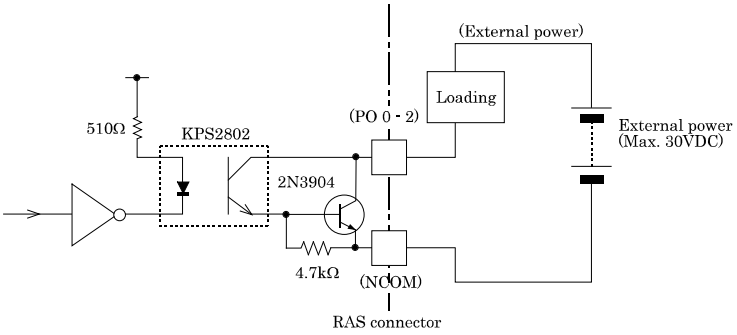


Figure 4.7. Output Circuit

5. BIOS Setup

Introduction

This chapter discusses Award's Setup program built into the FLASH ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The rest of this chapter is intended to guide you through the process of configuring your system using Setup.

Starting Setup

The Award BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1 By pressing <Del> immediately after switching the system on, or

2 By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to continue, DEL to enter SETUP

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Table 5.1. Using Setup

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AwardBIOS™ supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

A Final Note About Setup

The information in this chapter is subject to change without notice.

Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Note that a brief description of each highlighted selection appears at the bottom of the screen.

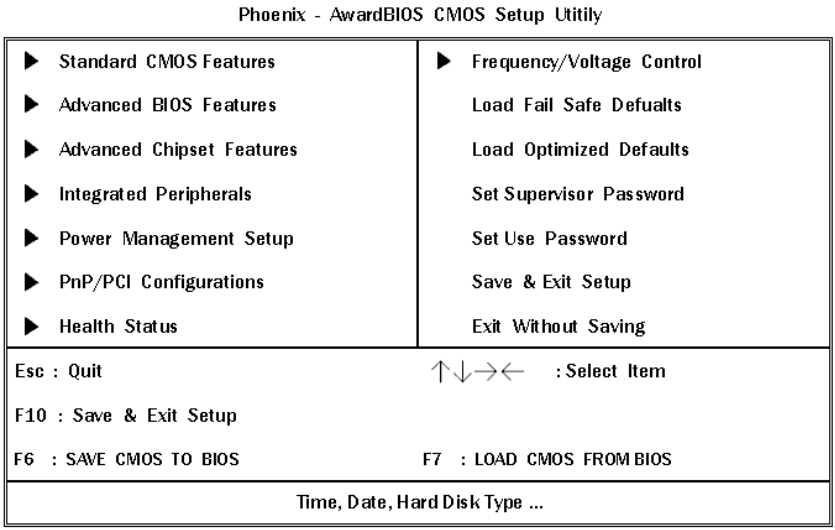


Figure 5.1. Main Manu

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features

Use this menu for basic system configuration.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Power Management Setup

Use this menu to specify your settings for power management.

PnP / PCI Configuration

This entry appears if your system supports PnP / PCI.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Supervisor / User Password

Use this menu to set User and Supervisor Passwords.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Save

Abandon all CMOS value changes and exit setup.

Standard CMOS Setup

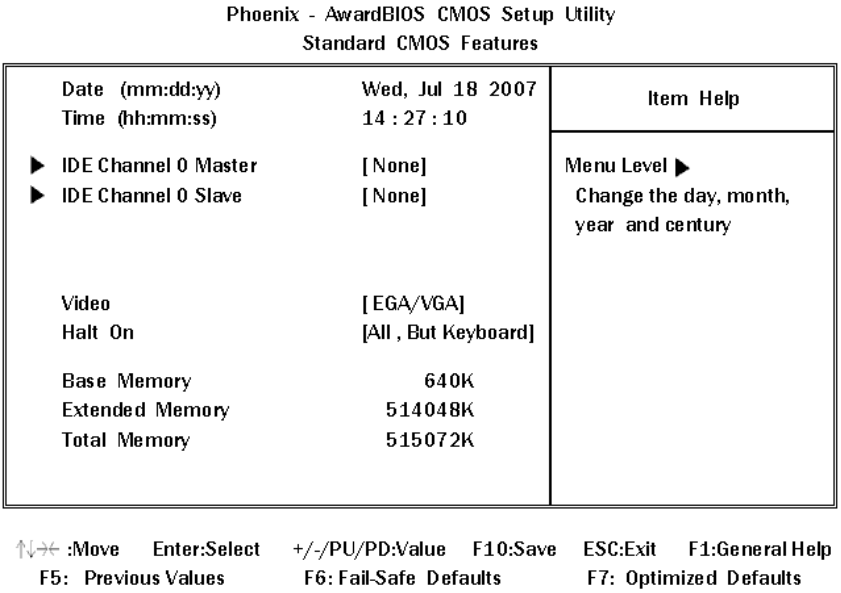


Figure 5.2. Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

Main Menu Selections

This table shows the selections that you can make on the Main Menu.

Table 5.2. Main Menu Selections

Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 0 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 1 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 1 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

IDE Adapters

Table 5.3. IDE Adapters configurations

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the CF card on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0/1 Master/Slave	None Auto Manual	Selecting 'manual' lets you set the re-maining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Capacity	Auto Display your CF card size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
Access Mode	CHS LBA Large Auto	Choose the access mode for this CF card.
The following options are selectable only if the 'IDE Channel 0/2 Master/Slave' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this CF card.
Head	Min = 0 Max = 255	Set the number of heads for this CF card.
Precomp	Min = 0 Max = 65535	**** **Warning** : Setting a value of 65535 means no CF card
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Advanced BIOS Features Setup

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

CPU Feature	[Press Enter]	Item Help
Hard Disk Boot Priority	[Press Enter]	
Virus Warning	[Disabled]	
CPU L1 & L2 Cache	[Enabled]	
Hyper-Threading Technology	[Enabled]	
Quiet Post	[Disabled]	
Quick Power On Self Test	[Enabled]	
USB Device Wait	[Disabled]	
First Boot Device	[USB-CDROM]	
Second Boot Device	[USB-FDD]	
Third Boot Device	[Hard Disk]	
Boot Other Device	[Enabled]	
Boot Up Numlock Status	[On]	
Gate A20 Option	[Fast]	
Typematic Rate Setting	[Disabled]	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	[Setup]	
APIC Mode	Enabled	
MPS Version Control For OS	[1.4]	
OS Select For DRAM > 64MB	[Non-OS2]	
WDT Protect	[Disabled]	
WDT Protect Time	[Disabled]	
Post Code Show	[Disabled]	
CF Backup	[Press Enter]	

Figure 5.3. Advanced BIOS Features Setup

CPU Feature

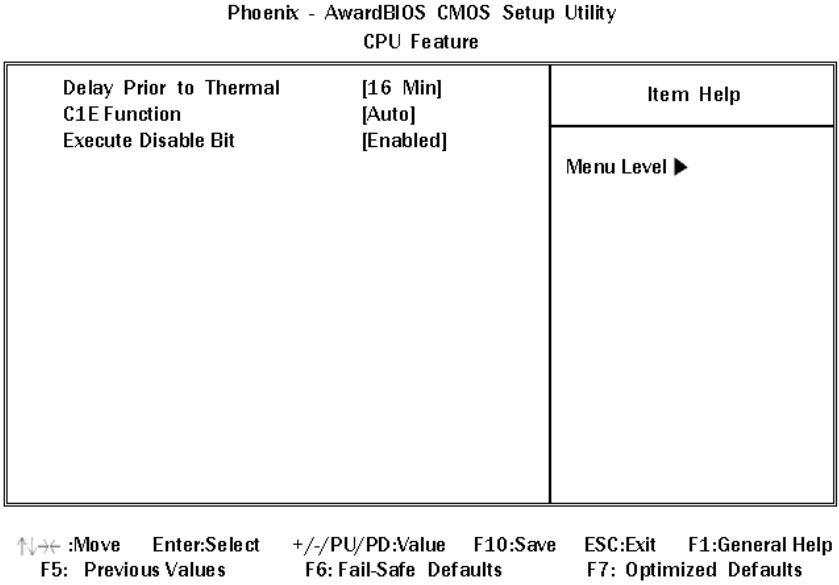
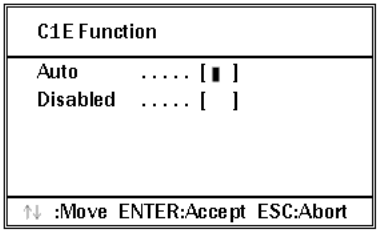
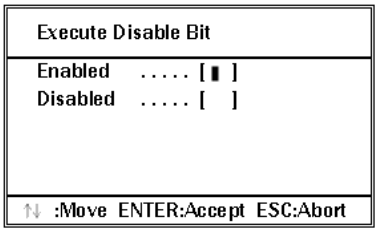
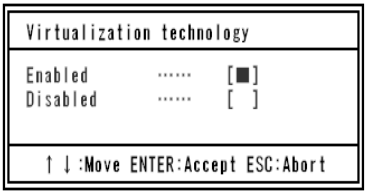


Figure 5.4. CPU Feature

CPU Feature lets you configure original CPU settings. As supported functions differ depending on the type of CPU, some items may not be displayed for some CPUs.

Table 5.4. CPU Features Selections

Description	Choice
Delay Prior to Thermal Select the interval to setup the delay timer for CPU Thermal-Throuttling	Delay Prior to Thermal 4 Min . . . . . [ ] 8 Min . . . . . [ ] 16 Min . . . . . [▮] 32 Min . . . . . [ ] ↑↓ :Move ENTER:Accept ESC:Abort

Description	Choice
C1E Function Configures the CPU C1E (power saving when CPU load is low) function.	
Execute Disable Bit When disabled, forces the XD (data execution prevention) feature flag to always return 0.	
Virtualization technology Enables/disables the virtualization support function.	

Hard Disk Boot Priority

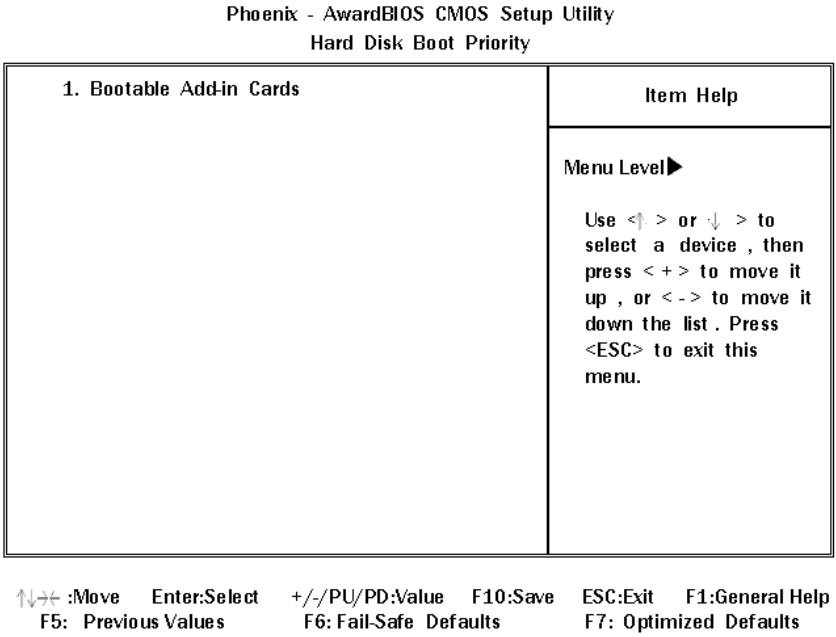


Figure 5.5. Hard Disk Boot Priority

CF cards, USB drives, and other connected hard disks are displayed, and an order of boot priority can be set. With the field, there is the option to choose, aside from the hard disks connected, “Bootable add-in Cards” which refers to other external device.

Virus Warning

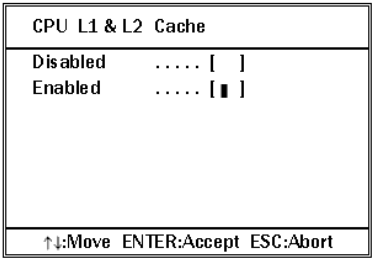
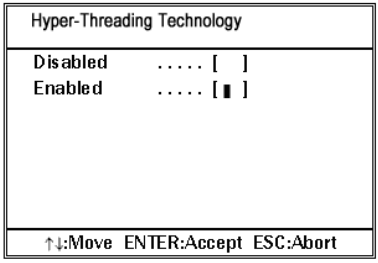
When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

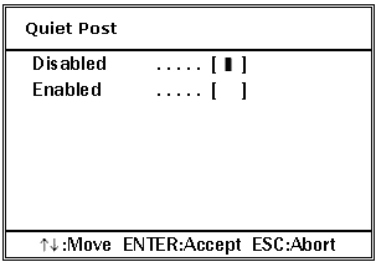
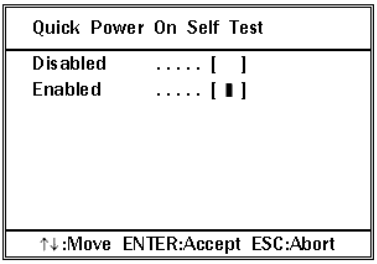
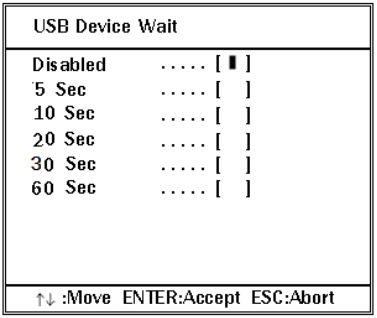
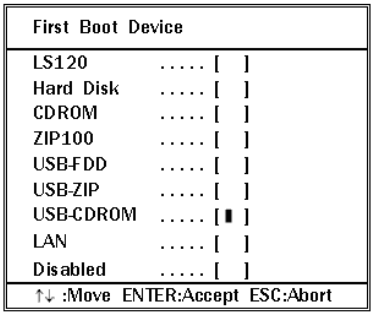
⚠ CAUTION

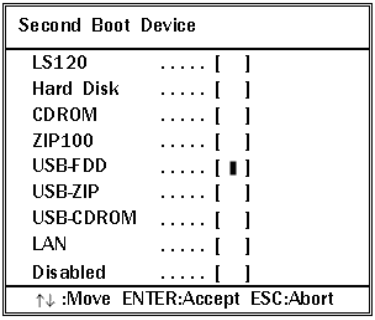
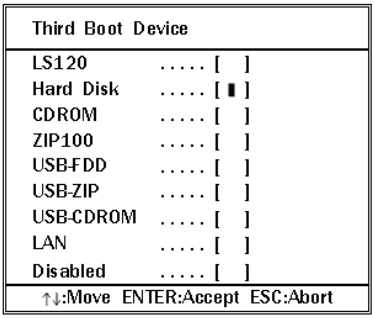
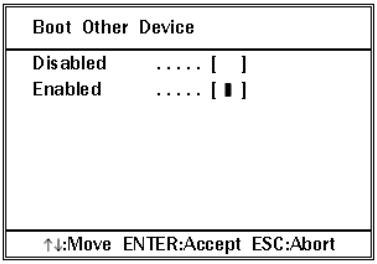
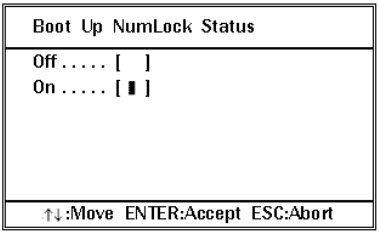
Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.

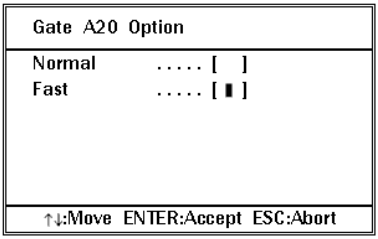
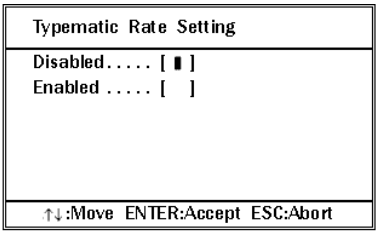
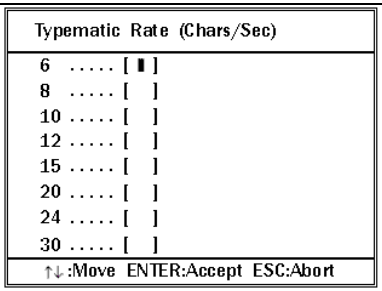
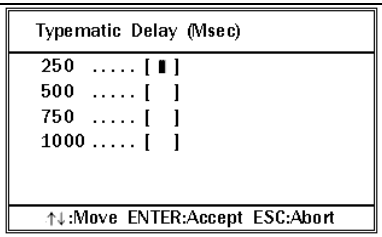
Enabled	Activates automatically when the system boots up causing a warning message to appear when any-thing attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

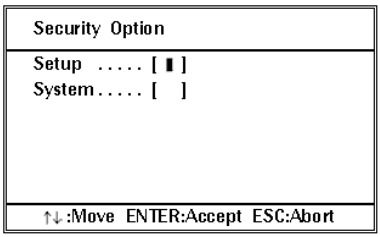
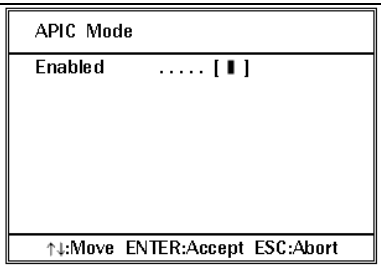
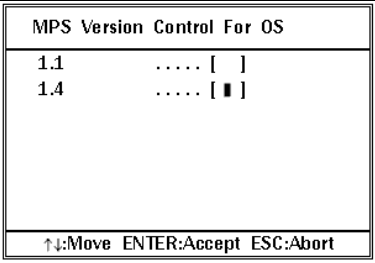
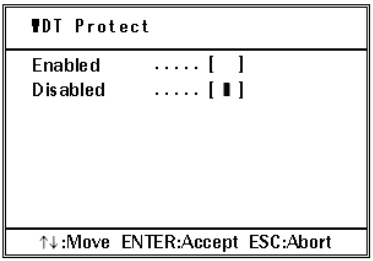
Table 5.5. Advance BIOS Feature Selections

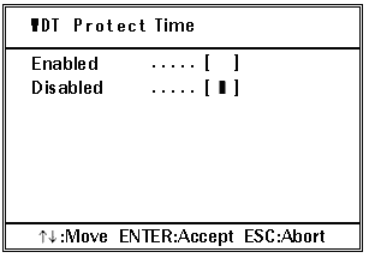
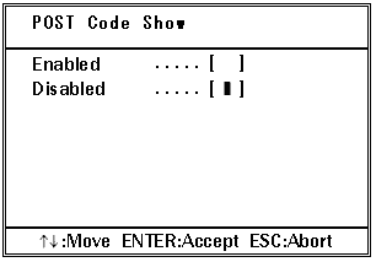
Description	Choice
CPU L1 & L2 Cache These allow you to enable (speed up memory access) or disable the cache function.	
Hyper-Threading Technology These allow you to enable or disable the Hyper-Threading function.	

Description	Choice
Quiet Post Skip certain self-diagnosis processes such as checking memory or other several devices for shorter bootup time. Default setting (Disabled) does not simplify the self-diagnosis process.	
Quick Power On Self Test Select Enabled to reduce the amount of time required to run the power-on self-test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. Better to find a problem during POST than lose data during your work	
USB Device Wait When USB devices, which need longer time to be booted, are connected, the boot possibly can not be processed in normal condition. To address such cases, this setting specifies the waiting time for BIOS and delays the start of the access to the USB devices. Therefore, the boot will be delayed by the specified waiting time.	
First Boot Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items.	

Description	Choice
Second Boot Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items.	
Third Boot Device The BIOS attempts to load the operating system from the devices in the sequence selected in these items.	
Boot Other Device Sets whether or not to try booting from another device.	
Boot Up NumLock Status Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.	

Description	Choice
Gate A20 option Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows	
Typematic Rate Setting When Disabled, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system. When Enabled, you can select a typematic rate and typematic delay.	
Typematic Rate (Chars/Sec) When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24 or 30 characters per second.	
Typematic Delay (Msec) When the speed setting for the key input is enabled, you can specify the interval of waiting time for the continuous key input.	

Description	Choice
Security Option Select whether the password is required every time the system boots or only when you enter setup. If you have set a password, select whether the password is required every time the System boots, or only when you enter Setup. System: The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt. Setup: The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.	
Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.	
APIC Mode APIC stands for Advanced Programmable Interrupt Controller. Note : This item is show only	
MPS Version Control For OS Use the Multiprocessor Specification (MPS) for OS option to specify the MPS version to be used. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability.	
WDT Protect WDT protect can be enabled to monitor the situations that halt BIOS bootup such as malfunction of the connected device(s), accidental noise, and some other unpredictable happenings. When Enabled, and if BIOS startup is halted during the startup, the system is reset and rebooting is attempted.	

Description	Choice
WDT Protect Time There is normally no need to change these settings. Use "Disabled".	
Post Code Show During BIOS startup, the Post Code is displayed at the right upper corner of the screen. The Post Code is shown, however, after the initialization of graphic device is finished and the system is ready for screen display.	
CF Backup Selecting this option allows you to launch a tool for creating the backup of CF and restoring it. This can be used to backup your current environment as it is. For details, please refer to the explanation below (*1).	---

*1 About the CF Backup Feature

To use the CF Backup feature, a separately-available CF for backup is required. The CF for backup must be the CF of the same model or larger capacity. Using the CF that is not our optional parts can be the cause of unidentified problems and it must be ensured that the CF works with your system without problem before using this feature.

Also, before performing backup, read the licensing terms of your operating system carefully so that the backup is carried out within the scope of given license.

Followings are the steps to use the CF Backup feature.

<Using the CF Backup Feature>

(1) Connect display and keyboard to the box computer.
(2) Insert the CF and the CF for backup to the respective CF slot before turning the power on.
(3) Press the “DEL” key before the startup to invoke the BIOS setting screen, and select “CF Backup” from menu.
(4) Follow the messages on the screen to proceed with the process. For the copy process, the Source Disk (the CF to be backed up) and the Destination Disk (the CF for backup) must be specified. The contents of the Source Disk can be lost if the Disks are wrongly assigned: ensure the correct operation by carefully reading the displayed message and performing the procedures accordingly.
(5) When the backup process is finished, the message “BACKUP finish, Press any key reboot.” is displayed. Enter any one of the alphabet keys from A to Z. The system reboots upon the key input.
(6) Backup completes when the above steps are done.

Advanced Chipset Features Setup

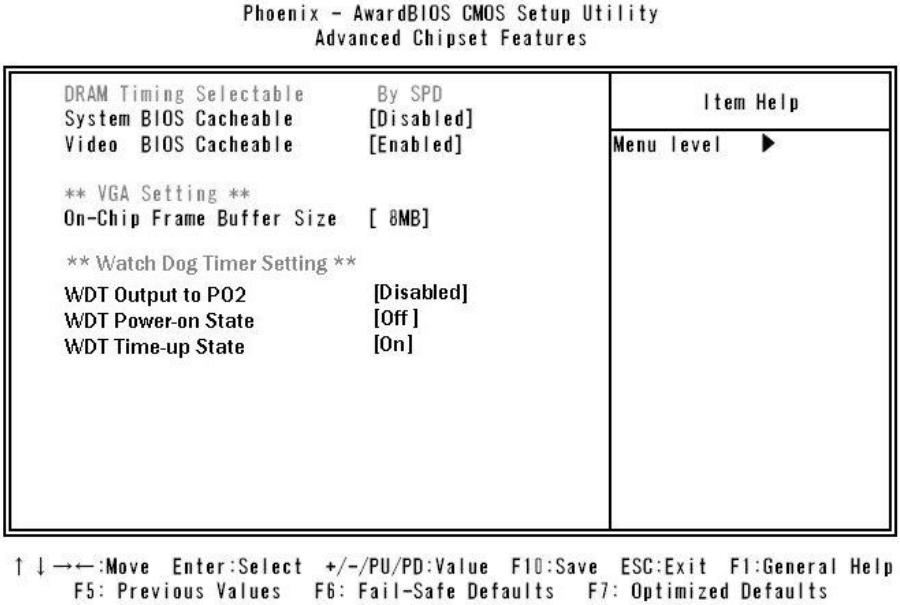
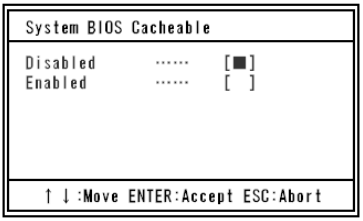
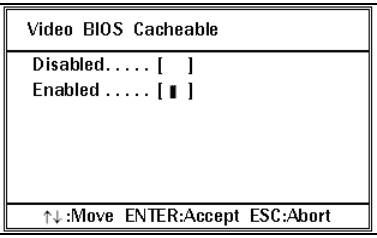


Figure 5.6. Advanced Chipset Features Setup

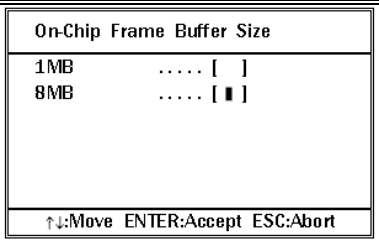
Table 5.6. Advance Chipset Feature Selections

Description	Choice
System BIOS Cacheable Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.	
Video BIOS Cacheable Selecting Enabled allows caching of the video BIOS ROM at C0000h - C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.	

VGA setting

The field under the On-Chip VGA Setting and their defaults settings are:

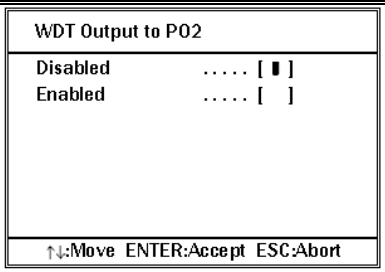
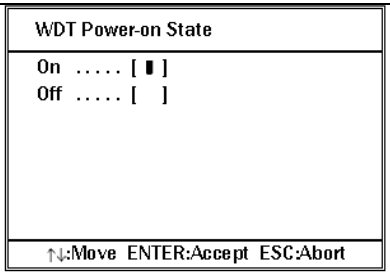
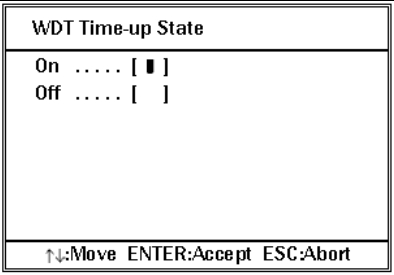
Table 5.7. VGA Setting Selections

Description	Choice
On-Chip Frame Buffer Size Lets you set the size of the VGA frame buffer.	

Watch Dog Timer Setting

These are settings of the output to the PO2 from watch dog timer for the RAS port.
For the models without the RAS port(s), this setting item is not displayed.

Table 5.8. Watch Dog Timer Setting

Description	Choice
WDT Output to PO2 Sets the output to the PO2 of watch dog timer. When “Enabled”, the watch dog timer output is sent to the PIO2 pin of the RAS connector. Actual value of the output is subject to the settings of “WDT Power-on State” and “WDT Time-up State”.	
WDT Power-on State This is “On” when the “WDT Output to PO2” is set to “Enabled”. This option sets the status of the output from the watch dog timer at the power on.	
WDT Time-up State This option is effective when the “WDT Output to PO2” is “Enabled”. Sets the status of the output from the watch dog timer at the time up of the watch dog.	

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

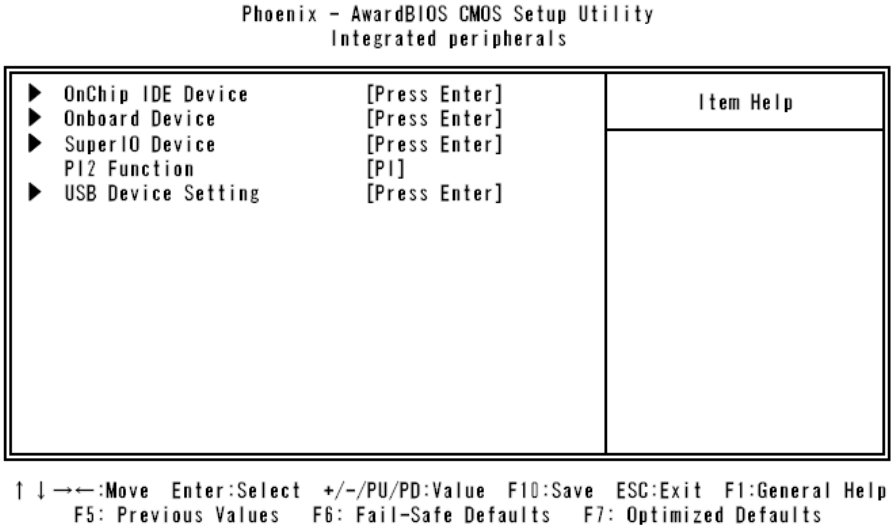


Figure 5.7. Integrated Peripherals

Table 5.9. Integrated Peripherals Setting

Description	Choice
PI2 Functon Sets the function of the PI2 pin of the RAS connector. The following settings are available: PI: Uses the PI2 pin as a general-purpose input. Power-BTN: PI2 input acts as the power button. Reset-BTN: PI2 input acts as the reset button.	PI2 Function PI ..... [■] Power-BTN ..... [ ] Reset-BTN ..... [ ] ↑ ↓:Move ENTER:Accept ESC:Abort

OnChip IDE Device

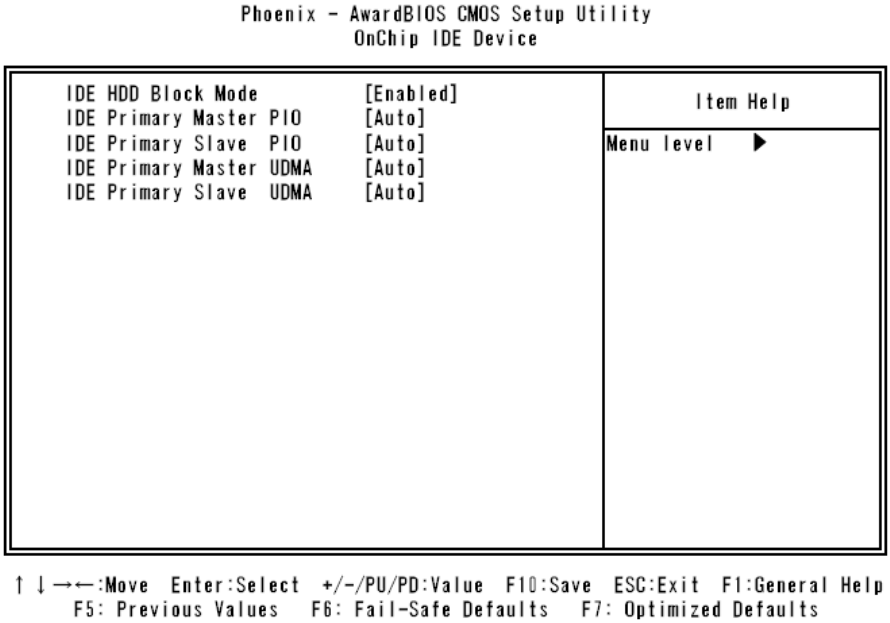
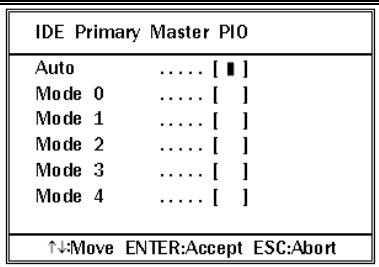
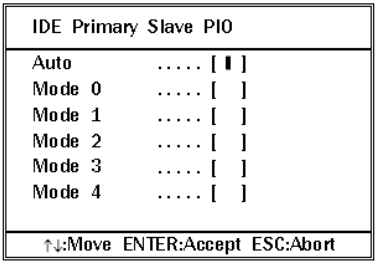
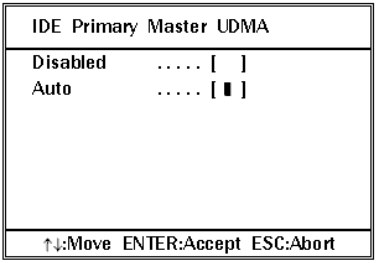
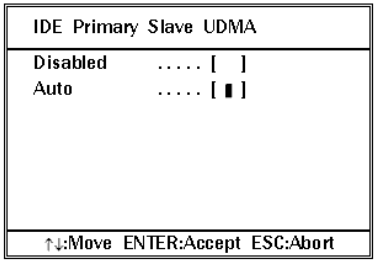


Figure 5.8. OnChip IDE Device

Table 5.10. On Chip IDE Device Selections

Description	Choice
IDE HDD Block mode Block mode is also called block transfer, multiple commands, or multiple sectors read/write. If the CF card supports block mode, when "Enabled" is selected, read/write operation is performed in the largest block the drive supports.	IDE HDD Block Mode Disabled ..... [ ] Enabled ..... [■] ↑↓:Move ENTER:Accept ESC:Abort

Description	Choice
IDE Primary Master / Slave PIO Sets the PIO mode (0-4) of the onboard IDE interface. If "Auto" is selected, the system automatically determines the optimal mode.	 
IDE Primary Master/Slave UDMA Enables/disables IDE UDMA (Ultra DMA) transfer. If "Auto" is selected, UDMA is enabled and the optimal transfer speed is selected automatically.	 

Onboard Device

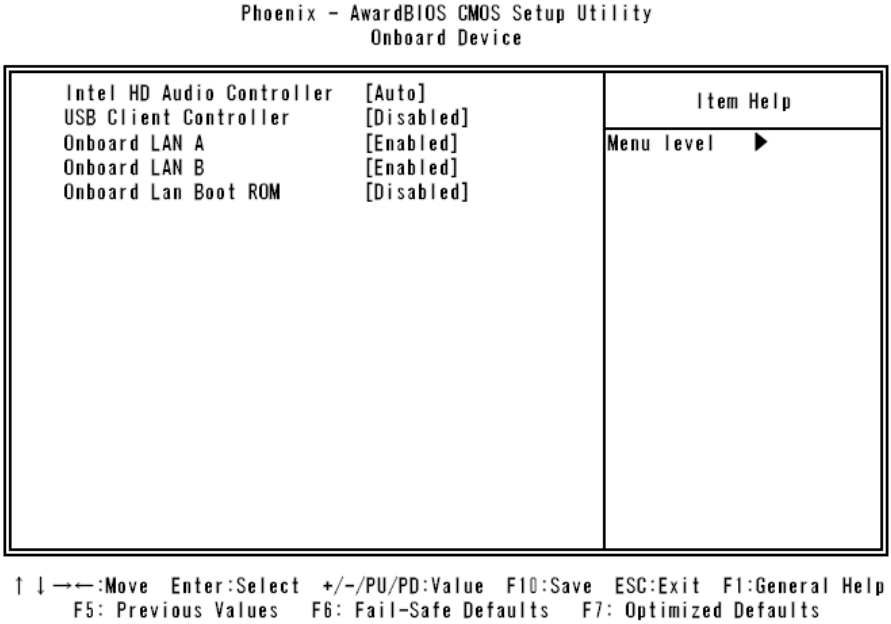
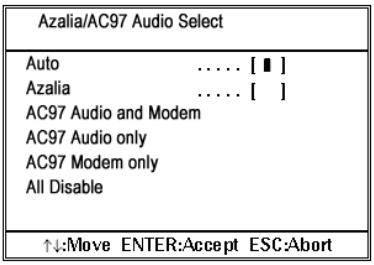
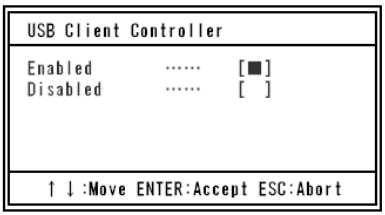
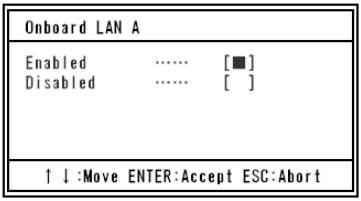
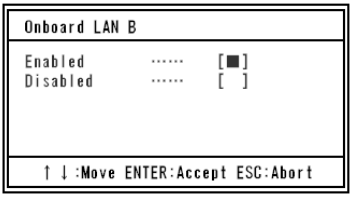
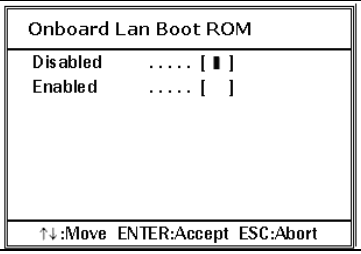


Figure 5.9. Onboard Device

Table 5.11. Onboard Device Selections

Description	Choice
Azalia/AC97 Audio Select Selects audio functions and enables/disables devices. There is normally no need to change these settings. Use "Auto".	
USB Client Controller To use this function, you must install a dedicated driver and configure settings. For more details on the dedicated driver and installation method, see IPC-SLIB-01.	

Description	Choice
Onboard LAN A Select "Enabled" to use the onboard LAN A controller.	
Onboard LAN B Select "Enabled" to use the onboard LAN B controller.	
Onboard LAN Boot ROM Select "Enabled" to boot via PXE (network boot). This setting is used for both Onboard LAN A and B. To give network boot priority, set "First Boot Device" to "LAN".	

USB Device Setting

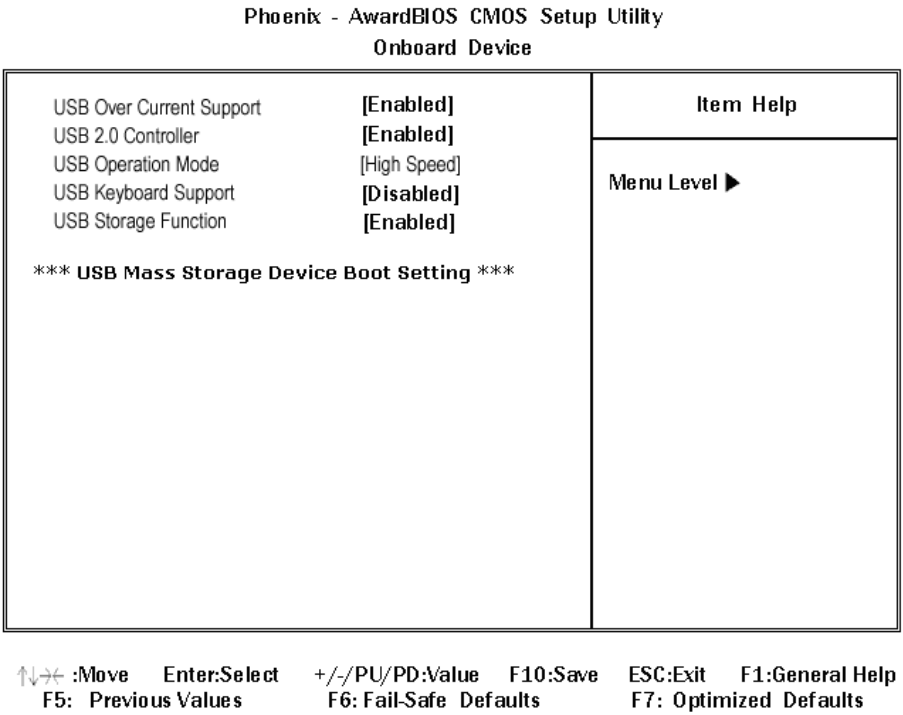
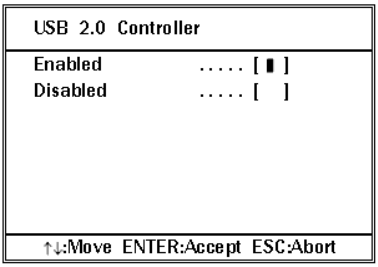
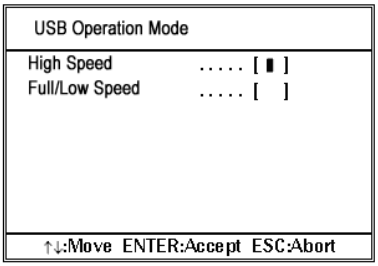
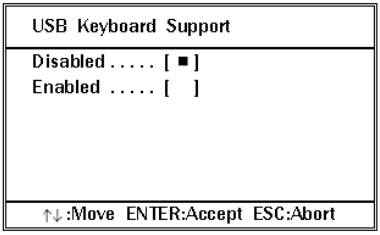
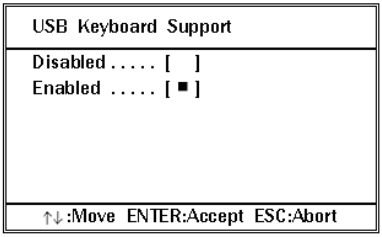


Figure 5.10. USB Device Setting

Table 5.12. USB Device Setting Selections

Description	Choice
USB 1.0 Controller Enables/disables the onboard USB 1.0 function. In normal cases, select "Enabled".	USB 2.0 Controller Enabled ..... [■] Disabled ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort

Description	Choice
USB 2.0 Controller Enable or disable the Onboard USB 2.0 function. In normal cases, use it while “Enable”.	
USB Operation Mode Select one of USB operation mode. In normal cases, use it while “High Speed”.	
USB Keyboard Support Select “Enabled” when a USB keyboard has to be used on the OS that does not support USB. Select “Disabled” for the OS that supports USB such as Windows XP.	
USB Storage Function Select “Enabled” when using the USB storage. But If you use hibernate function of Windows then please select “Disabled”.	

Super IO Device

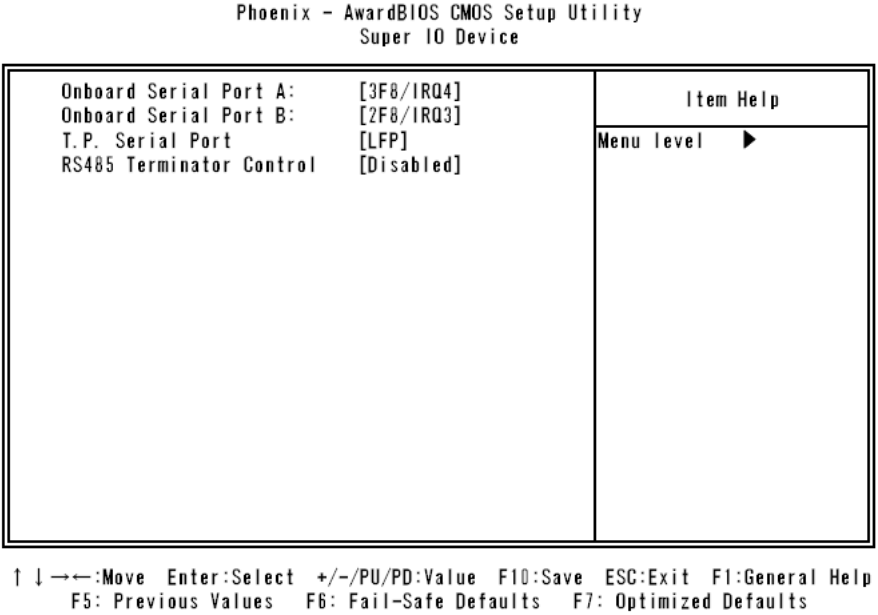
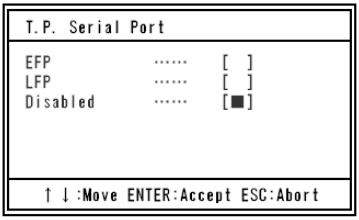
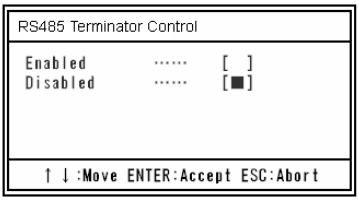


Figure 5.11. Super IO Device

Table 5.13. Super I/O device Selections

Description	Choice
Onboard Serial Port A Select an address and corresponding interrupt for the serial port A.	Onboard Serial Poart A Disabled ..... [ ] 3F8/IRQ4 ..... [■] 2F8/IRQ3 ..... [ ] 3E8/IRQ4 ..... [ ] 2E8/IRQ3 ..... [ ] 4F8/IRQ5 ..... [ ] 4E8/IRQ7 ..... [ ] Auot ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort
Onboard Serial Port B Select an address and corresponding interrupt for the serial port B.	Onboard Serial Poart B Disabled ..... [ ] 3F8/IRQ4 ..... [ ] 2F8/IRQ3 ..... [■] 3E8/IRQ4 ..... [ ] 2E8/IRQ3 ..... [ ] 4F8/IRQ5 ..... [ ] 4E8/IRQ7 ..... [ ] Auot ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort

Description	Choice
T.P. Serial Port Configures settings for the touch panel serial port. In normal cases, set it as “Disable”.	
RS485 Terminator Control Configures terminator settings for RAS connector and RS485 port.	

Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

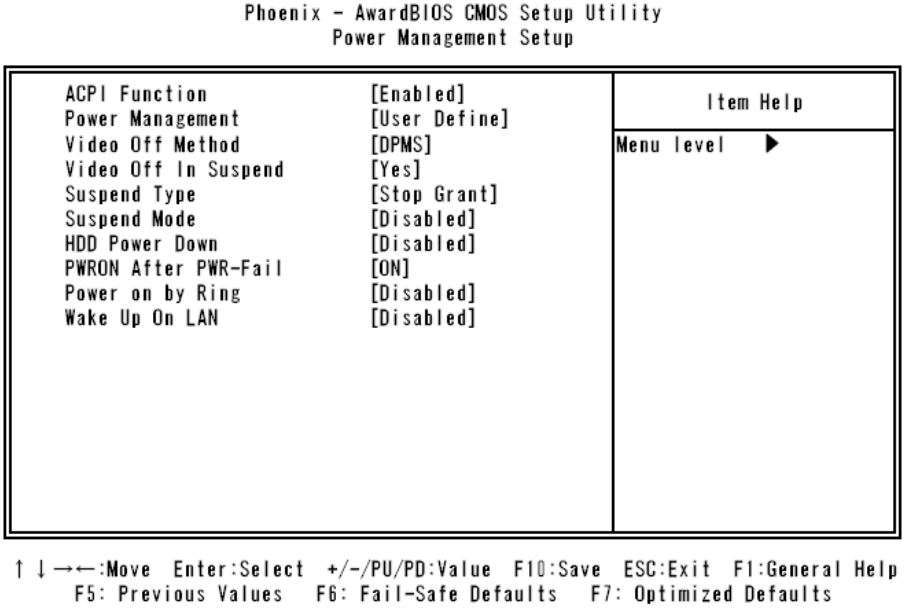
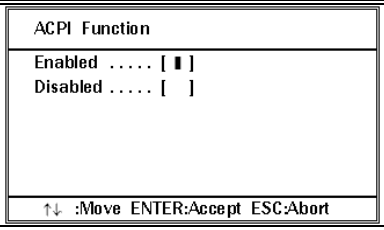
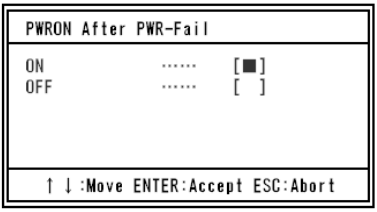
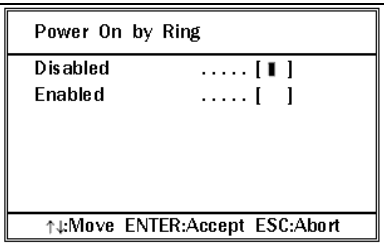
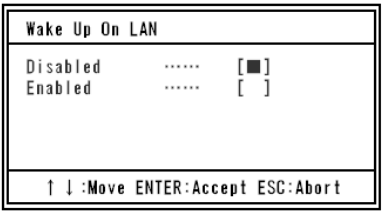


Figure 5.12. Power Management Setup

Table 5.14. Power Management setup Selections

Description	Choice
ACPI Function When set to 'Enabled', turns on the ACPI Function. By default, this field is "Enabled".	
Note: ACPI (Advanced Configuration and Power Interface) is a power management specification that makes hardware status information available to the operating system ACPI enables a computer to turn its peripherals on and off for improved power management. "Power Management" and other settings that are not explained here are not relevant when using Windows. Use the factory defaults for these settings.	
Power after PWR-Fail Configures actions for rebooting after DC input has stopped. When "ON" is selected, the PC always reboots when power is restored after a power cut or other power supply error.	
Power On by Ring When set to "Enabled", you can boot the system by incoming call (Ring signal) to the modem connected COM1 or COM2.	
Wake Up On LAN Enables/disables the wake-on-LAN function.	

PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

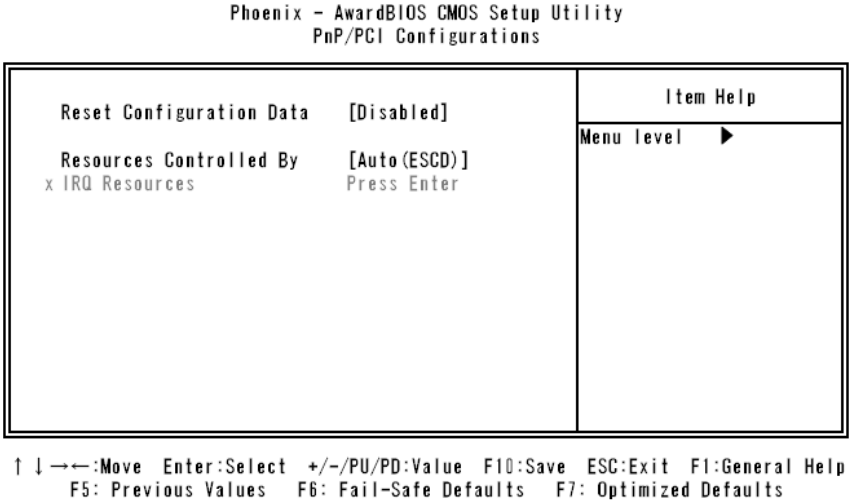


Figure 5.13. PnP/PCI Configuration Setup

PC Health Status

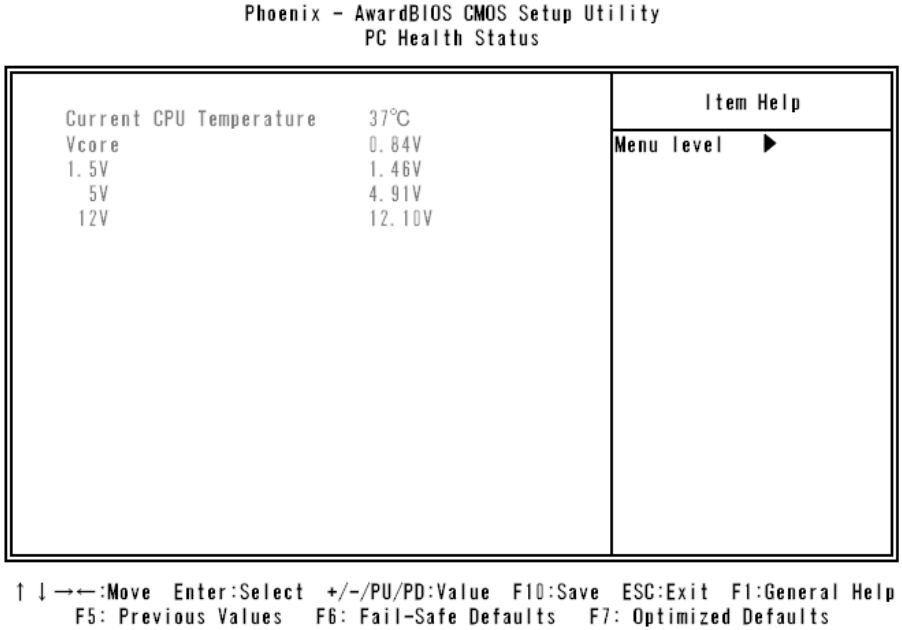


Figure 5.14. PC Health Status

The BIOS shows the PC health status in this window.

Table 5.15. PC Health Status Selections

Description	Choices
Current CPU Temp.	This field displays the current CPU temperature.
Vcore / 1.5V /5V / 12V	This field displays the current voltage.

Frequency/Voltage Control

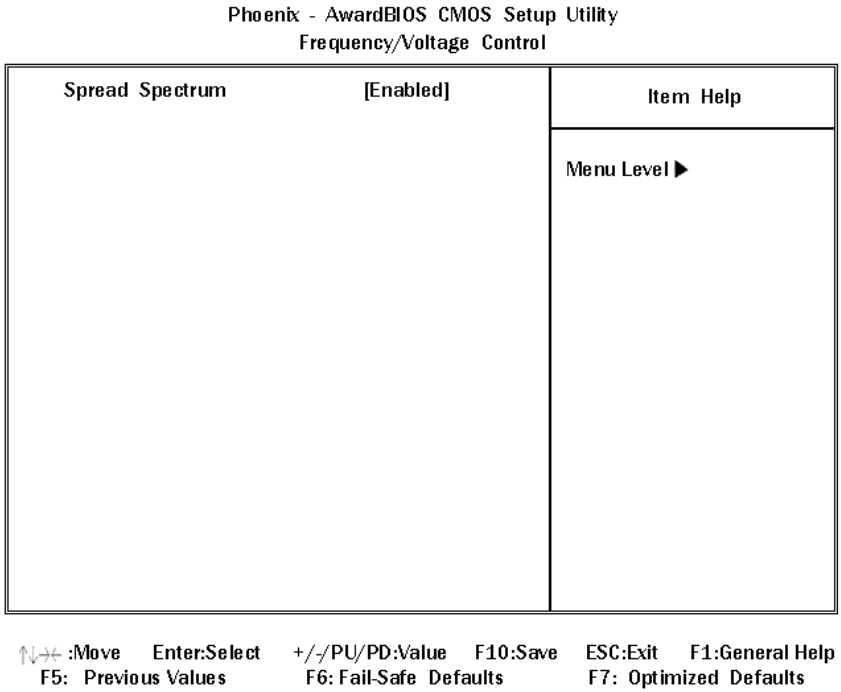


Figure 5.15. Frequency/Voltage Control

Table 5.16. Frequency/Voltage Control Selections

Description	Choices
Spread Spectrum When "Enabled" is selected, the waveform near the peak of the pulse created by the system clock generator is smoothed out to help reduce EMI.	Spread Spectrum Disabled . . . . . [ ] Enabled . . . . . [■] ↑↓:Move ENTER:Accept ESC:Abort

Defaults Menu

Selecting “Defaults” from the main menu shows you two options which are described below

Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing ‘Y’ loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load setup Defaults (Y/N) ? N

Pressing ‘Y’ loads the default values that are factory settings for optimal performance system operations.

Supervisor /User Password Setting

You can set either supervisor or user password, or both of then. The differences between are:

SUPERVISOR PASSWORD: can enter and change the options of the setup menus.

USER PASSWORD: just can only enter but do not have the right to change the options of the setup menus. When you select this unction, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED:

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

Exit Selecting

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation :

Save to CMOS and EXIT (Y/N)? Y

Pressing “Y” stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

POST Messages

During the Power On Self-Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message.

If a message is displayed, it will be accompanied by:

PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

POST Beep

Currently there are two kinds of beep codes in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps. The other code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

CMOS battery has failed

CMOS battery is no longer functional. It should be replaced.

DISK BOOT failure

[INSERT SYSTEM DISK AND PRESS ENTER]

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Check the boot drive connection and content.

Error encountered initializing hard drive

Hard drive cannot be initialized. Check that there are no problems with the CF connection and that the CF connection is configured correctly.

Error initializing hard disk controller

Hard disk controller cannot be initialized. Check that there are no problems with the CF connection and that the CF connection is configured correctly.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

Memory address error at…

Indicates a memory address error at a specific location.

Press a key to REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

Press F1 to disable NMI, F2 to REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

System halted, (CTRL-ALT-DEL) to REBOOT…

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Hard disk(s) fail (80)

HDD reset failed.

Hard disk(s) fail (40)

HDD controller diagnostics failed.

Hard disk(s) fail (20)

HDD initialization error.

Hard disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out – Unlock the key

This product does not have a keyboard lock. If this message is displayed, it is possible that the keyboard controller is damaged.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

BIOS ROM checksum error – System halted

The checksum of ROM address F0000H-FFFFFH is bad.

It is possible that the product is faulty or that ROM content has been falsified.

Memory test fail

BIOS reports the memory tests fail if the onboard memory is tested error.

Error loading operating system

Invalid System disk

These messages are displayed not because of BIOS issues, but because the boot record program on the disk has failed to load the operating system. Check the content of the disk.

6. Appendix

Memory Map

Table 6.1. Memory Map

Memory Segments	Comments
00000h - 9FFFh	0 - 640K DOS Region
A0000h - BFFFFh	Video Buffer
B0000h - B7FFFh	Monochrome Adapter range
C0000h - CFFFFh	Video BIOS
D0000h - DFFFFh	Expansion Area
E0000h - EFFFFh	Extended System BIOS Area
F0000h - FFFFFh	System BIOS Area
100000h - FFFFFFFFh	Extended Memory Area
00100000 - Top of Main Memory	Main DRAM Address Range
Top of Main Memory	Extended SMRAM Address Range
Top of Main Memory To 4GB	PCI Memory Address Range
D8000000h-FFFFFFFFh	System Reserved

I/O Port Addresses

Table 6.2. I/O Port Addresses

Address	Size	Description
0000 - 000F	16 bytes	DMA controller
0010 - 001F	16 bytes	Reserved
0020 - 0021	2 bytes	PIC interrupt controller
0022 - 003F	30 bytes	Reserved
0040 - 0043	4 bytes	System timer 1
0044 - 005F	24 bytes	Reserved
0060	1 byte	Keyboard controller
0061	1 byte	NMI, speaker controller
0062 - 0063	2 bytes	Reserved
0064	1 byte	Keyboard controller
0065-006F	11bytes	Reserved
0070 - 0073	4 bytes	RTC real time clock
0074 - 007F	12bytes	Reserved
0080 - 0090	17 bytes	DMA page register
0091-0093	3 bytes	Reserved
0094-009F	12 bytes	DMA controller
00A0 - 00A1	2 bytes	Interrupt controller 2
00A2 - 00BF	28 bytes	Reserved
00C0 - 00DE	31 bytes	DMA controller 2
00E0 - 00EF	16 bytes	Reserved
00F0 - 00FF	16 bytes	Arithmetic processor for numerical values
01F0 - 01F7	8 bytes	Primary IDE controller
0274 - 0277	4 bytes	Reserved (ISA PnP)
0279 - 0279	1 byte	Reserved
02A0 - 02CF	64 bytes	Reserved
02A8 - 02AF	8 bytes	RS485/422
02B0 - 02B7	8 bytes	Touch Panel
02F8 - 02FF	8 bytes	COM2
0388 - 038D	6 bytes	Reserved
03B0 - 03DF	48 bytes	Video
03F6	1 byte	Primary IDE
03F8 - 03FF	8 bytes	COM1
0400 - 04BF	191bytes	Reserved
04D0 - 04D1	2 bytes	Interrupt setting register (Edge/level triggered PIC)
0500 - 051F	32 bytes	Reserved
0800 - 088F	143 bytes	Reserved
0A79 - 0A79	1 byte	Reserved
0CF8 - 0CFF	4 bytes	PCI configuration register
0CF9	1 byte	Turbo and reset control register
D000 - FFFF	12287 byte	Reserved

Interrupt Level List

Table 6.3. Hardware Interrupt Levels (Factory Settings)

Type	8259	Priority	Description	Vector
NMI		High	-I/O CHK	02H
IRQ0	MASTER	↑	Timer 0	08H
IRQ1	”		System reserved	09H
IRQ2	”		Interrupt controller 2 (slave)	0AH
IRQ8	SLAVE		Real-time clock	70H
IRQ9	”		System reserved	71H
IRQ10	”		Not in use (Available for users)	72H
IRQ11	”		Not in use (Available for users)	73H
IRQ12	”		Not in use (Available for users)	74H
IRQ13	”		Co-processor	75H
IRQ14	”		Primary IDE	76H
IRQ15	”		Not in use (Available for users)	77H
IRQ3	MASTER		Serial port 2 (COM2)	0BH
IRQ4	”		Serial port 1 (COM1)	0CH
IRQ5	”		Not in use (Available for users) *1	0DH
IRQ6	”	↓	Not in use (Available for users)	0EH
IRQ7	”	Low	Not in use (Available for users)	0FH

*1 Interrupt is a list of states that do not use the APIC. As Windows uses the APIC, PCI device interrupts are allocated after IRQ16.

POST Codes

Table 6.4. POST Codes ***< 1 / 5 >***

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	Clear 8042 interface Initialize 8042 self-test
08h	Test special keyboard controller for Winbond 977 series Super I/O chips. Enable keyboard interface.
09h	Reserved
0Ah	Disable PS/2 mouse interface (optional). Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detects flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel®) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved

Table 6.4. POST Codes *< 2 / 5 >*

POST (hex)	Description
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	Program CPU internal MTRR (P6 & PII) for 0 - 640K memory address. Initialize the APIC for Pentium class CPU. Program early chipset according to CMOS setup. Example: onboard IDE controller. Measure CPU speed. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	Initialize multi-language Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.

Table 6.4. POST Codes ***< 3 / 5 >***

POST (hex)	Description
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	Calculate total memory by testing the last double word of each 64K page. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	Program MTRR of M1 CPU Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. Initialize the APIC for P6 class CPU. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	Display PnP logo Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved
5Dh	Initialize Init_Onboard_Super_IO switch. Initialize Init_Onbaord_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse

Table 6.4. POST Codes ***< 4 / 5 >***

POST (hex)	Description
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	USB final Initialization NET PC: Build SYSID structure Switch S screen back to text mode Set up ACPI table at top of memory. Invoke ISA adapter ROMs Assign IRQs to PCI devices Initialize APM Clear noise of IRQs.

Table 6.4. POST Codes ***< 5 / 5 >***

POST (hex)	Description
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	Enable L2 cache Program boot up speed Chipset final initialization. Power management final initialization Clear screen & display summary table Program K6 write allocation Program P6 class write combining
95h	Program daylight saving Update keyboard LED & typematic rate
96h	Build MP table Build & update ESCD Set CMOS century to 20h or 19h Load CMOS time into DOS timer tick Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

COM I/O Address and Register Function

The following table lists the I/O addresses in case of COM 1.

Table 6.5. I/O Address

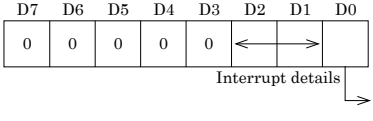
I/O address	DLAB	Read/Write	Register	
03F8H	0	W	Transmitter holding register	THR
		R	Receive buffer register	RBR
	1	W	Divisor latch register (LSB)	DLL
03F9H	1	W	Divisor latch register (MSB)	DLM
	0	W	Interrupt enable register	IER
03FAH	X	R	Interrupt ID register	IIR
03FBH	X	W	Line control register	LCR
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

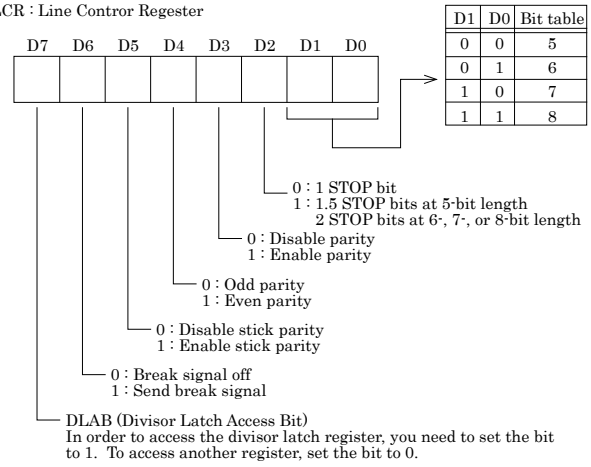
DLAB (Divisor Latch Access Bit) : The value in bit 7 of the line control register.

Table 6.5. 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 6.6. 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


</td></tr>
</table>

Table 6.6. Function of Each Register ***< 3 / 4 >***

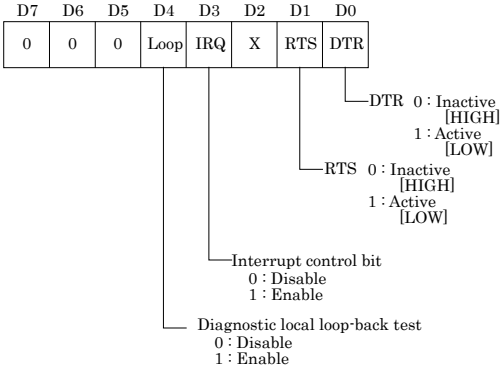
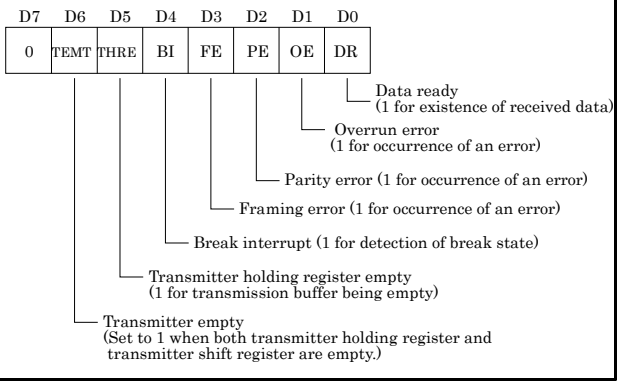
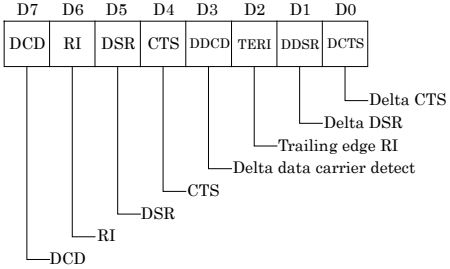
I/O address	Description
03FCH	MCR: Modem Control Register 
03FDH	LSR: Line Status Regester 

Table 6.6. 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 for SERIAL1, 2. 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 6.7. Baud Rate Settings

Baud rate to be set	SERIAL1, 2 Clock input (1.8432MHz)	
	Value to be set in the divisor register (Decimal)	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	---
14400	8	---
19200	6	---
28800	4	---
38400	3	---
57600	2	---
76800	---	---
115200	1	---
153600	---	---
230400	---	---

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

Watch-Dog-Timer

The watchdog timer serves as a safeguard against possible system lock-up in your industrial computer system. In most industrial environments, there are heavy equipment, generators, high-voltage power lines, or power drops that have adverse effects on your computer system. For instance, when a power drop occurs, it could cause the CPU to come to a halt state or enter into an infinite loop, resulting in a system lock-up.

The application software created by user with the watchdog timer enabled, a RESET automatically generated unless the software periodically triggers the timer within the setting time-out interval. That is, while the system gets hung up, the running program can't trigger the timer periodically. The timer will generate a reset signal to reboot the system.

You can select from the four options below for actions taken after a timeout.

- Reset signal output
- Shutdown (Windows used)
- PO0, L output
- PO0, H output

This feature allows a running program to restart in an orderly way when a power glitch or any abnormal condition occurs.

The watchdog timer comes with 65535-level time-out interval, 1 - 65535 seconds per interval, which can be adjusted by software setting. There is a tolerance of 2 second for this time-out interval. To maintain the normal system operation, trigger the timer periodically by the user-created program in consideration of the tolerance.

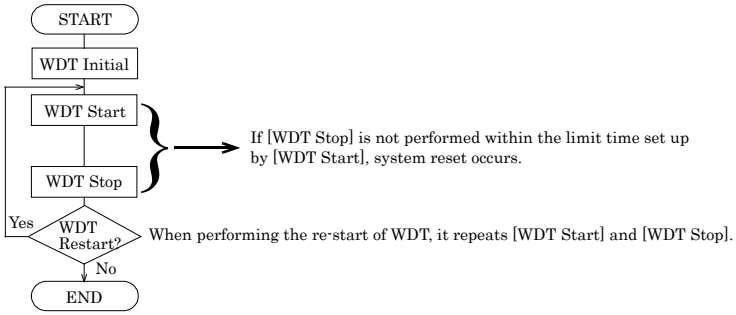
CONTEC's Web site [IPC-SLIB-01], which is bundled with this product, contains a sample program for the watchdog timer. To view the sample program for the watchdog timer, decompress "HWMandRTCut.zip", which is found under \RasUtility\Samples\Module.

Ex.) If the time-out interval is set to 30 seconds, the user-created program must retrigger the watchdog timer before 28 seconds will have elapsed in consideration of the tolerance. If the program failed to retrigger the timer (if 28 - 32 seconds have elapsed), the system will automatically reboot.

The I/O port is defined at address 2e/2fH. You can trigger/enable disable the timer by writing address 2e/2fH.

Here is an example for flow chart and programming how to use the watch-dog-timer.

(1) Example flow chart



* It is also possible not to perform [WDT Stop] instead of performing [WDT Stop] to [WDT Start], but to perform [WDT Start] continuously at the time of a re-start.

(2) Example programming

The following example is written in Intel8086 assembly language.

In this example, open and close commands are written separately for the sake of convenience, but in an actual program, always ensure that open is executed before a command is issued and that close is always executed when a command is issued.

```
    ;===============
    ; WDT Open
    ;===============
CHK_OPEN1:
  MOV     DX,2A4H
  IN      AL,DX
  TEST    AL,2                ;Check status of output
  JNZ     CHK_OPEN1
  MOV     DX,2A0H
  MOV     AL,87H              ;Open Command
  OUT     DX,AL
CHK_OPEN2:
  MOV     DX,2A4H
  IN      AL,DX
  TEST    AL,2                ;Check status of output
  JNZ     CHK_OPEN2
  MOV     DX,2A0H
  MOV     AL,87H              ;Open Command
  OUT     DX,AL
CHK_OPEN3:                    ;Check status of input
  MOV     DX,2A4H
  IN      AL,DX
  TEST    AL,1
  JZ      CHK_OPEN3
  MOV     DX,2A0H
  IN      AL,DX               ;Open success if AL = AAH
```

```
    ;===============
    ; WDT Close
    ;===============

CHK_CLOSE1:
  MOV     DX,2A4H
  IN      AL,DX
  TEST    AL,2                ;Check status of output
  JNZ     CHK_CLOSE1
  MOV     DX,2A0H
  MOV     AL,AAH              ;Close Command
  OUT     DX,AL
CHK_CLOSE2:
  MOV     DX,2A4H
  IN      AL,DX
  TEST    AL,1                ;Check status of input
  JZ      CHK_CLOSE2
  MOV     DX,02A0H
  IN      AL,DX               ;Close success if AL = 55H

    ;===============
    ; Set WDT Time & Set WDT Output<Initial>
    ;===============
CHK_CMD1:
  MOV     DX,2A4H
  IN      AL,DX
  TEST    AL,2                ;Check status of output
  JNZ     CHK_CMD1
  MOV     DX,2A0H
  MOV     AL,98H              ;Set WDT Time Command
  OUT     DX,AL
CHK_CMD2:
  MOV     DX,2A4H
  IN      AL,DX
  TEST    AL,2                ;Check status of output
  JZ      CHK_CMD2
  MOV     DX,2A0H
  MOV     AL,0                ; AL= WDT Time MSB
  OUT     DX,AL               ; IF AL=1     256Sec
CHK_CMD3:
  MOV     DX,2A4H
  IN      AL,DX
  TEST    AL,2                ;Check status of output
  JZ      CHK_DI3
```

```
   MOV     DX,2A0H
   MOV     AL,0FH              ; AL= WDT Time LSB
   OUT     DX,AL               ; AL=F     15Sec
CHK_RES1:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,1                ;Check status of input
   JZ      CHK_RES1
   MOV     DX,2A0H
   IN      AL,DX               ; Retrun Data = 98H
CHK_CMD4:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                ;Check status of output
   JZ      CHK_DI4
   MOV     DX,2A0H
   MOV     AL,9bH              ; Set WDT Function
   OUT     DX,AL
CHK_CMD5:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                ;Check status of output
   JZ      CHK_DI5
   MOV     DX,2A0H
   MOV     AL,00H              ; AL=0:Reset,10h:PO2->L,20h:PO2->H,30h: Assert SCI
   OUT     DX,AL
CHK_RES2:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,1                ;Check status of input
   JZ      CHK_RES2
   MOV     DX,2A0H
   IN      AL,DX               ; Retrun Data = 9bH


    ;================================
    ;<WDT START : counter start or restart >
    ;================================
CHK_CMD6:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                ;Check status of output
   JZ      CHK_CMD6
   MOV     DX,2A0H
   MOV     AL,99H              ; 99h WDT Start Command
   OUT     DX,AL               ;
CHK_RES3:
   MOV     DX,2A4H
```

```
   IN      AL,DX
   TEST    AL,1                ;Check status of input
   JZ      CHK_RES3
   MOV     DX,2A0H
   IN      AL,DX               ; Retrun Data = 99H


     ;================================
     ;<WDT STOP >
     ;================================
CHK_CMD7:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,2                ;Check status of output
   JZ      CHK_CMD7
   MOV     DX,2A0H
   MOV     AL,9aH              ; 9ah WDT Stop Command
   OUT     DX,AL               ;
CHK_RES4:
   MOV     DX,2A4H
   IN      AL,DX
   TEST    AL,1                ;Check status of input
   JZ      CHK_RES4
   MOV     DX,2A0H
   IN      AL,DX               ; Retrun Data = 9aH
```

⚠ CAUTION

The timer's intervals have a tolerance of ±2 seconds.

CF selection

Our CFs listed on Chapter 7 are different from general ones. Following shows the different between them for your reference.

	Our CFs	General CF (example)	Anxiety on using general CFs
Operating temperature	-40 to 85 °C	0 to 60 °C	- They do not meet thermal specification of PC. - Their thermal margin is so small that data can be broken easily.
Flash memory type	SLC	MLC	- Data can be broken easily. - Write/Erase endurance is bad as below.
Write/Erase endurance	100,000 times	3,000 times	- Product life against write/erase cycles should be short. - Data retention becomes weak after write/erase aging.
Ware leveling	Static	Dynamic	- Specific part of cells may be writed / erased frequently so that life troubles can happen early.
Fixed Disk	YES	NO	- CF has the bit which indicates “Fixed Disk”. Windows treats the CF as local disk if this bit is active, or treats as removable disk. If Windows is installed to removable disk, the operation can not be guaranteed.
Combinatorial evaluation	YES	NO	- CF is connected as IDE so that compatibility problem between master and slave may happen. We did not evaluate this problem for general CFs. Therefore some problems may happen (for example, PC may be unable to recognize the CF).
Various evaluation	YES	NO	- All our evaluation tests are done with our CFs. So we can not guarantee the operation of PC with any other CFs.

If you need to use our PC under its specification, you have to use our CFs. If you use any other CFs, CONTEC cannot guarantee this PC’s specification.

Battery

Battery Specification

This product uses the following battery.

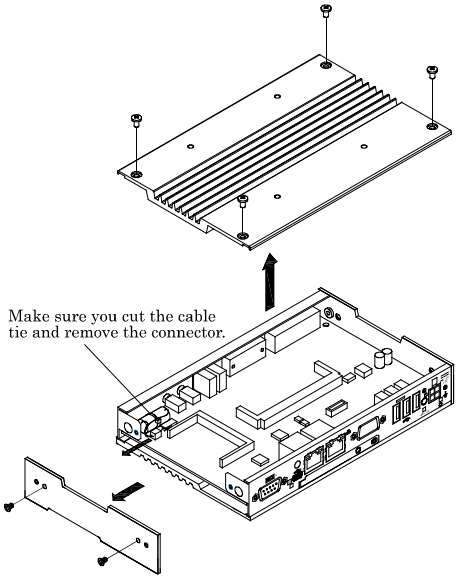
- Type : Lithium primary battery
- Model : BR-1/2AA
- Maker : Panasonic
- Nominal voltage : 3V
- Nominal capacity : 1000mAh
- Lithium content : 1g or less

Removing the battery

Remove the battery according to the following figure.

Removing the battery

Remove the battery according to the following figure.



Disposing the battery

Dispose the removed battery properly as instructed by local government.

7. List of Options

AC adapter

- IPC-ACAP12-04 AC adapter (Input: 100-240VAC, Output: 12VDC 4A)

CF Card

- CF-1GB-B 1GB CompactFlash for Fix Disk
- CF-2GB-B 2GB CompactFlash for Fix Disk
- CF-4GB-B 4GB CompactFlash for Fix Disk
- CF-8GB-B 8GB CompactFlash for Fix Disk

TFT color liquid-crystal display

< LVDS&DVI input type > [for BX-2x0D-DCxxxx]

- FPD-H71XT-DC1 *1 (15inch 1024 x 768 dots, Panel mounted type)
- FPD-L71ST-DC1 *1 (12.1inch 800 x 600 dots, Panel mounted type)
- FPD-S71VT-DC1 *1 (6.4 inch 640 x 480 dots, Panel mounted type)
- FPD-H75XT-DC1 *1 (15inch 1024 x 768 dots, Embedded type)
- FPD-L75ST-DC1 *1 (12.1inch 800 x 600 dots, Embedded type)
- FPD-M75VT-DC1 *1 (10.4inch 640 x 480 dots, Embedded type)

*1 Please purchase the optional connection cable [IPC-DVI/D-020, IPC-DVI/D-050].

<Analog RGB types> [for BX-2x0-DCxxxx]

- 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)

Display cable only for DVI input [for BX-2x0D-DCxxxx]

- IPC-DVI/D-020 DVI-D Cable (2m)
- IPC-DVI/D-050 DVI-D Cable (5m)

Touch-panel cable for an analog RGB display [for BX-2x0-DCxxxx]

- IPC-CBL3-2 AT host Touch panel, COM cable (2m)
- IPC-CBL3-5 AT host Touch panel, COM cable (5m)

Terminal block for connecting the RAS connector

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

⚠ CAUTION

Precautions when using products other than our options

- If a product other than our option is used, the normal operation may be impaired or the functions may be limited.

BX200 Series

User's Manual

BX-2x0-DCxxxx

BX-2x0D-DCxxxx

CONTEC CO.,LTD.

July 2015 Edition

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Japanese http://www.contec.co.jp/

English http://www.contec.com/

Chinese http://www.contec.com.cn/

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