IPC Series

PANEL-PC 955 Series
Fanless, Atom N270, CF, 12.1 inch
XGA model
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.

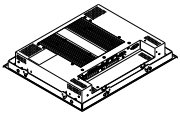
Product Configuration List

	PT-955LXC-DC5311 [Panel Mount] OS-installed model [WES2009] Japanese
Name	Pcs.
Panel-PC	1
Waterproof packing	1
The attachment fittings	8
CF card removal prevention fitting	1 *1
Power supply connector complete set	
Power connector	1
Contact	4
Cable clamp	1
DVI-analog RGB conversion adapter	1
Product guide (this sheet)	1
IPC Precaution List	1
Warranty Certificate	1
Serial number label	1
Royalty consent contract	1
Setup Procedure Document	1
Notes on using Windows Embedded Standard	1
Recovery Media *2	1

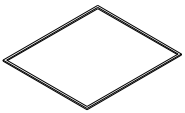
*1 It is attached to the main body.

*2 Please confirm latest information on the CONTEC homepage though the user's manual is stored in Recovery Media.

Product Configuration Image

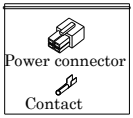


Panel-PC
(PT-955LXC-DC5311)



Waterproof packing
(for PT955LXC)

Cable clamp



Power supply
connector complete
set

The attach
ment fittings
(for PT955LXC)

CF card
removal
prevention
fitting

DVI-analog RGB
conversion adapter

Product guide

IPC Precaution List

Royalty
consent
contract

Setup
Procedure
Document

Notes on using
Windows Embedded
Standard

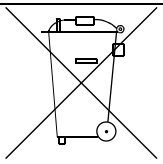
Recovery Media

Warranty Certificate

Serial number label

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

About the handling of the battery and the storage battery in E U signatory



Note: This symbol mark is for EU countries only.
This symbol mark is according to the directive 2006/66/EC Article 20 Information for end-users and Annex II.

This symbol means that batteries and accumulators, at their end-of-life, should be disposed of separately from your household waste.

If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration.

This will be indicated as follows:
Hg: mercury (0.0005%), Cd: cadmium (0.002%), Pb: lead (0.004%)

These ingredients may cause serious hazardous for human and the global environment.

Please refer to the user's manual for the annulment of detaching a detailed battery specification and the battery and the batteries.

Copyright

Trademarks

Table of Contents

1. Introduction

About the Product

This product is a fanless PANEL-PC for embedded use based on Intel (R) Atom processor N270 and a 945GSE (GMA950 incorporated) chipset. Adoption of the long life power saving LED and Intel (R) Atom processor offers low power consumption while ensuring sufficient performance.
The "resource-saving PC" contributes downsizing and power-saving of equipment to reduce your running cost and to promote energy efficiency.

It has extended interfaces such as 1000BASE-T, USB2.0, and serial. It adopts CF card for the storage and is fanless, which demonstrate the totally spindleless design that simplifies the maintenance.

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.

According to your application, two types (the panel mount type and the open frame type) are available.

This product is available in the following 1 model:

- WES-installed model and panel mount type equipped with Intel Atom Processor N270 1.60GHz
  PT-955LXC-DC5311 (12.1 inch, LCD (XGA), Memory 1GB,
  Windows Embedded Standard 2009 (Japanese version), CF 2GB)

Features

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

Power consumption is about 30% less compared to the conventional standard model (IPC-PT700HX-AC426). Due to adoption of the low power consumption LED backlight and Intel (R) Atom processor N270, low power consumption, approximately 41W*1 even at a high load condition, is achieved at the same time sufficient performance is ensured, contributing to the lesser running cost.

*1 Median value of power consumption of a standard model PT-955LXC-DC5311 with input power of 24VDC under unloaded and fully-loaded conditions.

- High definition supported DVI external display output

This product has the up to 1920 x 1080 pixels DVI external display output as standard feature. A stand-alone two-displays application which, for example, displays the screen on a big LCD TV separately from the main LCD, can be built. Also, with the accompanying analog RGB (15 pin HD-SUB) conversion adapter, connecting to an analog RGB display is supported.

- Remote power management function to reduce operation tasks

This product supports timed/automated system start-up (Resume By Alarm). For example, it enables unattended operation, such as starting to show information of an establishment in unison at opening time. Also, it supports system start-up externally via network (Wake On LAN) and modem (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 4, serial (RS-232C) x 2.
It has 2 CF card slots that can use for OS and data. They are very useful because you can use one slot for system start-up and the other for maintenance, system log, or taking away the collected data.

- Falling-off prevention tools and cable 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*2 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.

*2 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. *3

*3 When using the AC adapter, limits are placed on the expansion board power supply capacity and the external device power supply capacity.

- Touch panel enables keyboard-less operation.

These products have analog touch panel enabling mouse emulation using driver software.

Supported OS

- Windows Embedded Standard 2009 (PT-955LXC-DC5311)

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 PT-955 Series

Handling Precautions

⚠ WARNING

- Always check that the power supply is turned off before connecting or disconnecting power cables.
- Procedures that could result in serious injury or loss of human life should never be performed from a touch panel. Use system design methods that can guard against input errors.
- 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.

⚠ 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 disconnect the power cable from the receptacle before mounting or removing the expansion board, or before connecting or disconnecting any 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.
- Do not use any sharp-pointed object such as a mechanical pencil to touch the touch panel. Doing so may scratch the touch panel, resulting in malfunctions.
- Do not subject the touch panel to shock as doing so may break it.
- When the surface or frame of the touch panel has become dirty, wipe it with neutral detergent. Do not wipe the touch panel with thinner, alcohol, ammonia, or a strong chlorinated solvent. Use a protective sheet (available as an option) if the touch panel is used where it can easily collect dust and dirt.
- It is a characteristic of analog touch panels that their resistance may vary with changes to the ambient environment (temperature and humidity) and with their own aging, resulting in the deviation of the detection point. If this is the case, calibrate the touch panel again to re-set calibration data.
- LCD may have a few bright spots that are always on or a few black spots that are always off. Color irregularity may also occur depending on the viewing angle. This however is due to the structural characteristics of the LCD; therefore, it is not a product fault.

- Burn-in on TFT Display
  "Burn-in" may occur if the same display is retained for a long time. Avoid this by periodically switching the display so that the same display is not maintained for a long time.
  * Burn-In : Phenomenon characterized by a TFT display as a result of long-time display of the same screen where a shadow-like trace persists because electric charge remains in the LCD element even after the patterns are changed.
- 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.
- 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℃ with the power disconnected is 10 years or more.
  (2) CF ---The OS-installed model uses a CF card in the OS storage area. Estimated failure rates: 100,000 rewrite cycles, 500,000 hours MTBF. For more details, refer to Section 6 "Life of CF".
  (3) Touch panel--- The operating lifetime of the touch panel is at least 1 million touches (as tested by mechanical touching under 300g of force at a rate of two presses per second).
  (4) LCD backlight--- Display brightness decreases over time with use. The operating lifetime of the backlight is 50,000 hours (the time until the brightness is lowered to 50% of the initial value).
  * Replacement of expendables is handled as a repair (there will be a charge).
  * Component life is not guaranteed value but only referential value.

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		PT-955LXC-DC5311
Assembly type		Panel mounted
CPU		Intel® Atom™ Processor N270 (1.60GHz / FSB533MHz)
Chip set		Intel® 945GSE + ICH7M-DH
BIOS		BIOS (mfd. by Award)
Memory		1GB (200pin SO-DIMM x 1), PC2-4300 DDR2 SDRAM
Graphic	Controller	Intel® GMA950 (Built in 945GSE chip set) Multi-monitor function supported *1
	Video RAM	Main memory shared
	Video BIOS	64KB(C0000H-CFFFFH)
LCD type	LCD type	12.1-inch TFT color LCD, XGA(1024 x 768), 260,000 colors
	Backlight	LED method, The ON/OFF software can control.
Touch panel	Resolution	4096 x 4096 (emulated in 1024 x 768 mode)
	Detection method	Resistive-film analog type
	Connection	Internal serial port
External display output	DVI*2	640 x 480, 800 x 600, 1,024 x 768, 1,152 x 864, 1,280 x 600, 1,280 x 720, 1,280 x 768, 1,280 x 960, 1,280 x 1,024, 1,360 x 768, 1,400 x 1,050, 1,600 x 900, 1,600 x 1,200, 1,856 x 1,392, 1,920 x 1,080, 1,920 x 1,200 (16,770,000 colors)
	Analog RGB	640 x 480, 800 x 600, 1,024 x 768, 1,280 x 768, 1,280 x 1,024, 1,360 x 768, 1,400 x 1,050 (16,770,000 colors)
Audio		AC97 compliant, LINE OUT x 1, MIC IN x 1
IDE		Primary IDE Master / Slave (Max 2 devices), CF card slot connection
LAN*3		Intel® 82573L Controller 1000BASE-T/100BASE-TX/10BASE-T x 2 (Wake On LAN support)
USB		USB 2.0-compliant 4 port
Serial		RS-232C 3 port (one of the ports is used for touch panel), Baud rate: 50 - 115,200bps
General-purpose I/O		None
Hardware monitoring		Monitoring CPU temperature, board temperature, power voltage
Watch dog timer		Software programmable, 255 level (1sec - 255 sec), Causes a reset upon time-out.
Real-time clock		ICH7M-DH integrated, The real-time clock is accurate within ±3 minutes (at 25°C) per month, Lithium backup battery life : 10 years or more
Power Management		Power management setup via BIOS, Power On by Ring / Wake On LAN, Supports PC98/PC99 ACPI Power management

*1: A multi-screen display function using the main LCD and an external display. The "Twin" option is, however, not available for a combination with an external DVI-connected display. "Extended desktop" or "Intel ® dual display clone" can be used instead.

*2: Display of the DVI-connected screen becomes active after the Windows starts up.

*3: Care about ambient temperature when using 1000BASE-T. Refer to "Installation Requirements" in chapter 3 for details.

Table 2.1. Functional Specification < 2 / 2 >

Model		PT-955LXC-DC5311
Interface	External display	1 port (29 pin DVI-I connector), DVI-analog RGB conversion adapter attachment
	Audio	LINE OUT: ϕ3.5 Stereo mini jack, Full-scale output level 1.5Vrms (Typ.), Dual 50mW Amplifier MIC IN: ϕ3.5 Stereo mini jack, Full-scale input level 1.3Vrms (Typ.)
	CF card slot	2 slots (CF1/CF2), CF CARD Type I, bootable
		CF1 is finished mounting CF (2GB, 1 partition) *4
	LAN*3	2 port (RJ-45 connector)
	USB	4 port (A-TYPE connector)
	RS-232C	2 port (9pin D-SUB connector [male])
Power supply	Power supply connector	12 - 24VDC *5
	Input power supply voltage	10.8 - 31.2VDC
	Current consumption	12VDC: 3.5A(Typ.)　4.5A (Max.) 24VDC: 1.7A(Typ.)　2.3A (Max.)
	External device power supply capacity	+12VDC 0.5A +5VDC 1A *7 +3.3VDC 0.5A *7 -12V 80mA CF Card slot : +3.3VDC 1A (500mA per one slot), USB port　: +5VDC 2A (500mA per one slot) *6
Waterproofing and dust-proofing		Front panel IP65 standard
Panel cut dimensions (mm)		303.0 (W) x 243.0 (H)
Physical dimensions (mm)		316 (W) x 102.8 (D) x 256 (H) (internal-panel depth) (Storage device isn't included)
Weight		4.0kg (without mounting bracket) 4.1kg (with mounting bracket)

*4: 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.

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

*6: Ensure that the total current for the USB port power supply capacity is 2.5 A or lower.　When using a total current 1.5 A or higher, be careful of the ambient temperature. For details, refer to chapter3, Installation Requirements.

Table 2.2. Installation Environment Requirements

Model		PT-955LXC-DC5311
Operating temperature *7		< When using 100BASE-TX/10BASE-T > 0 - 50°C (When the total current for the USB port power supply capacity is 1.5 A or higher : 0 - 45°C) < When using 1000BASE-T > 0 - 45°C (When the total current for the USB port power supply capacity is 1.5 A or higher : 0 - 40°C)
Storage temperature		-10 - 60°C
Operating humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gas		None
Noise resistance	Line noise	AC line / ±2kV *8, 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 0.15 mm 57 - 150Hz / 2.0G, 40 min. each in x, y, and z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
Impact resistance		10G, half-sine shock for 11 ms in x, y, and z directions (JIS C60068-2-27-compliant, IEC60068-2-27-compliant)
Grounding		Class D grounding, SG-FG / continuity

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

*8: When using the AC-DC power supply.

Display Optical Specifications

Table 2.3. Display Optical Specifications

Parameter	Condition			Min.	Typ.
Visual angle (vertical)	CR≧10	ϕ = 180°	Display. Monochrome	70deg	80deg
		ϕ = 0°		70deg	80deg
Visual angle (horizontal)		ϕ = +90°		70deg	80deg
		ϕ= -90°		70deg	80deg
Surface brightness (at center)	Display in white			190cd/m²	250cd/m²

* "Surface brightness" represents a numerical value per display. The expected brightness through a touch panel is about 80% lower than the above value.

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness at screen center with white displayed}}{\text{Brightness at screen center with black displayed}}$$

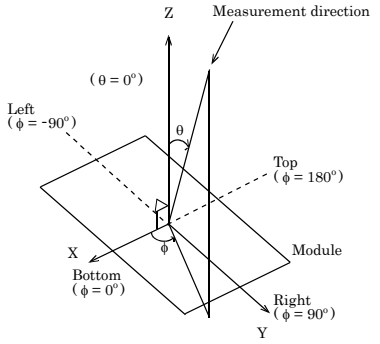


Figure 2.1. Definition of viewable range

⚠ CAUTION

The above optical specification data shows optical characteristics of the liquid crystal in the display; the data does not represent the actual view on the display or its viewing angles.

Power Management Features

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

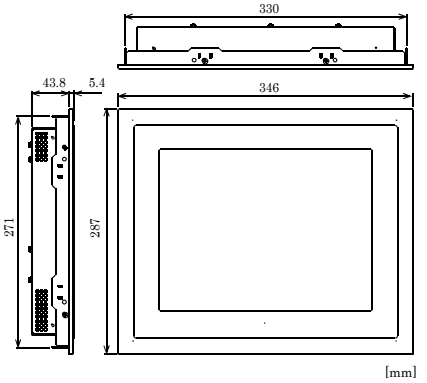
Table 2.4. DC voltage tolerance

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

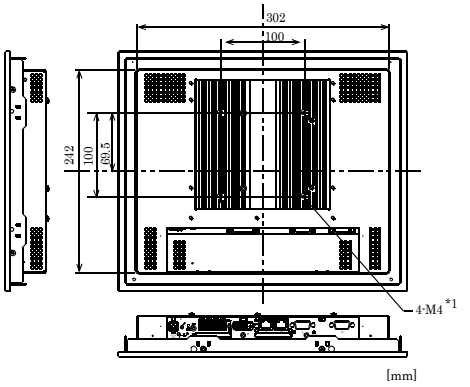
Physical Dimensions

PT-955LXC-DC5311

Front



Back face



*1 : The length (L) from the tip of M4 boss to the M4 screw tip should be 5mm or less.
If not doing so, it may be exactly fixed.

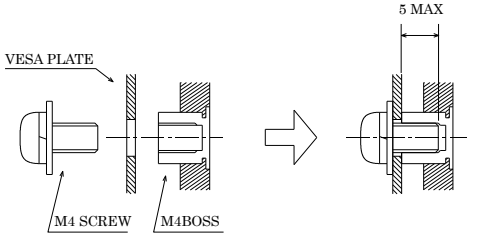


Figure 2.2. Physical Dimensions (PT-955LXC-DC5311)

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 mouse, 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.

* 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.

Attaching the CF Attachment Fittings

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

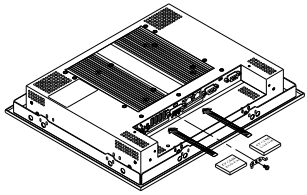


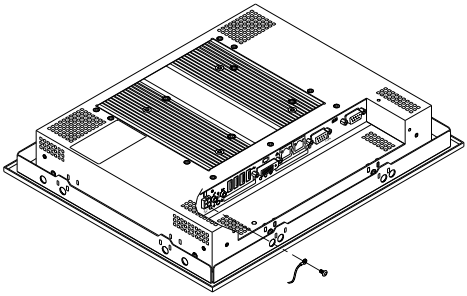
Figure 3.1. Attaching the CF Attachment Fittings

⚠ 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 3 - 3.5kgf·cm.

Attaching the FG

(1) Use screws to attach the FG.



* Attached screw (M3 x 8)

Figure 3.2. 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

The system unit has a hole for attaching cable clamp. 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.

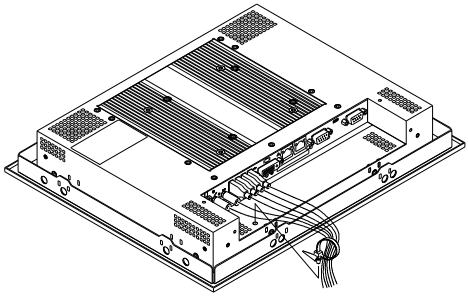


Figure 3.3. Attaching the cable clamp

Hardware Setup

PT-955LXC-DC5311

(1) Cut out a panel according to the following dimensions to mount the main unit.

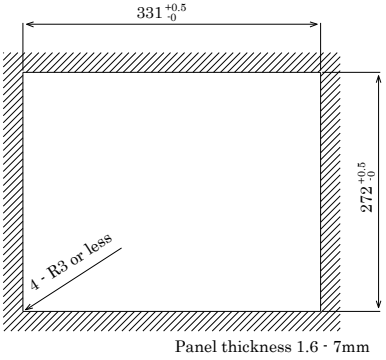


Figure 3.4. Dimensions of Panel Opening (PT-955LXC-DC5311)

(2) Place the waterproof packing in the groove on the front face of the main body and insert the main body into the panel from the external side.

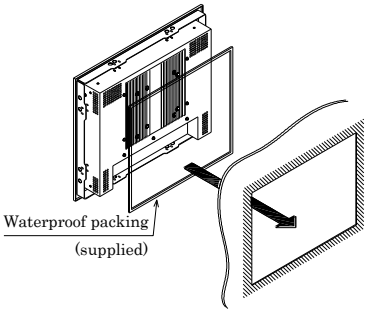


Figure 3.5. Attaching the waterproof packing (PT-955LXC-DC5311)

(3) Hold the attachment fittings from the inside of the panel.

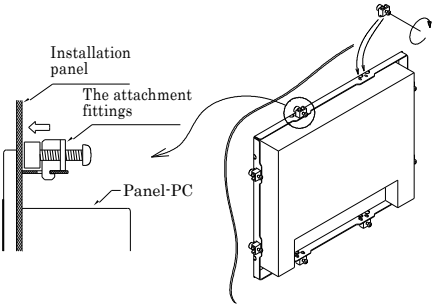
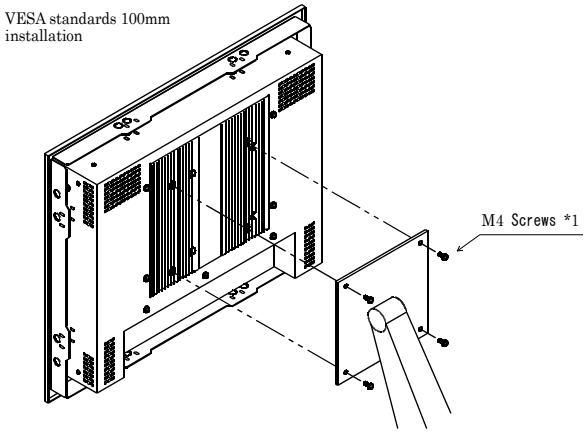


Figure 3.6. Hardware Setup (PT-955LXC-DC5311)

When using VESA standard 100mm mounting holes

The main body has mounting holes according to VESA standard 100mm. When using a VESA standard 100mm stand or the like, attach it as shown the following figure.



*1 : The length (L) from the tip of M4 boss to the M4 screw tip should be 5mm or less.
If not doing so, it may be exactly fixed.

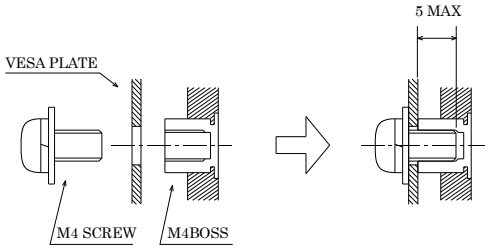


Figure 3.7. Installation of VESA metal fittings

Installation Requirements

Be sure that the ambient 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.

Installed angle which is recommended 45°

Installed angle of this product which is recommended is 0 - 45°. Except for that, the temperature specification of this product might not be filled.

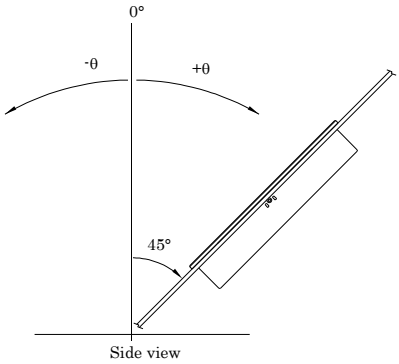


Figure 3.8. Installed angle which is recommended

⚠ CAUTION

Attention: Even if the ambient temperature is within the usage range, if the product is installed near devices that generate high temperatures, the product may experience the effects of radiation which will cause its temperature to rise and may lead to product malfunctions.

Distances between this product and its vicinity

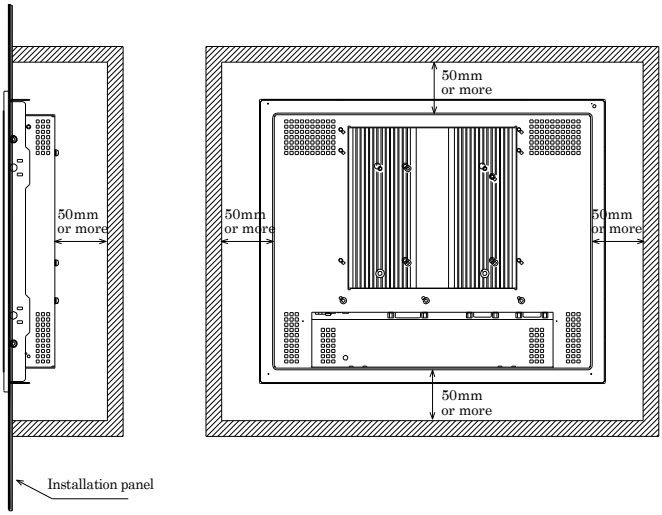


Figure 3.9. Distances between this product and its vicinity

⚠ CAUTION

Do not install this product into the fully-sealed space except the case in which the internal temperature is adjustable by equipment such as air conditioner. Troubles such as operational malfunctions could be occurred by the temperature increase caused by long-term usage.

Ambient temperature

In this product, the ambient 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.

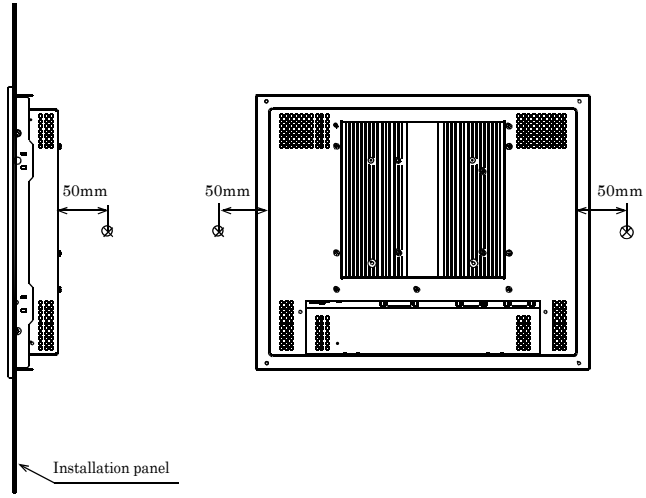


Figure 3.10. Measurement points of ambient temperature

4. Each Component Function

Component Name

Side view

PT-955LXC-DC5311

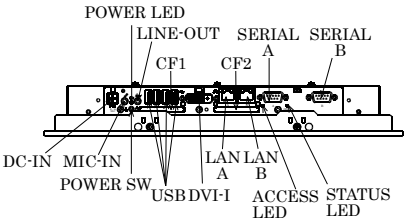


Figure 4.1. Component Name

Table 4.1. Component Function

Name	Function
POWER-SW	Power switch
POWER LED	Power ON display LED
ACCESS LED	IDE disk access display LED
STATUS LED	Status LED
DC-IN	DC power input connector
LINE OUT	Line out (ϕ3.5 PHONE JACK)
MIC IN	Mic in (ϕ3.5 PHONE JACK)
LANA	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector
LANB	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector
USB	USB port connector x 4
SERIALA	Serial port A connector (9pin D-SUB/male)
SERIALB	Serial port B connector (9pin D-SUB/male)
DVI-I	Display (29pin female)
CF1	CF card slot (IDE connection mastering)
CF2	CF card slot (IDE connection slaving)

System Configuration

PT-955LXC-DC5311

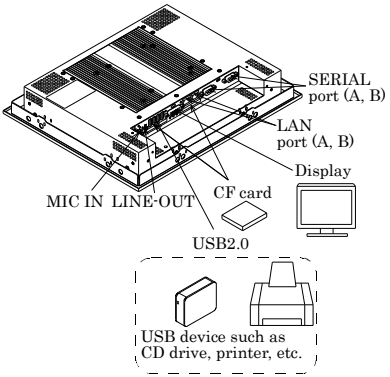


Figure 4.2. System Configuration

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
	Flashing, ON (Red)	You can control the behavior of LED from the user application. *1

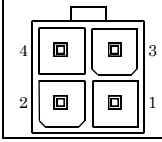
*1 API that controls STATUS LED is available. See the API description file "mtdll_e.chm" included in /RasUtility/Samples in the CONTEC's Web site [IPC-SLIB-01] for details.

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 4.5A or more, 24V 2.3A 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)

Applicable connector on the connector side

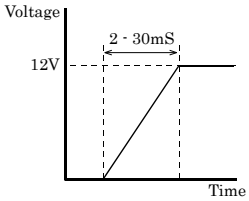


Figure 4.3. Graph of Rise Time of Power Supply

Power switch: POWER SW

POWER SW is provided.

Line out Interface: LINE OUT

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

Mic 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.

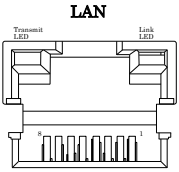
Install the appropriate audio driver for your OS from the CONTEC's Web site CD-ROM [IPC-SLIB-01]. (For information on the latest version of IPC-SLIB-01, check the CONTEC's Web site.)

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 82573L

Table 4.4. 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 LAN 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.
- If you want to use WOL function, please select "Enable" at the item "Enable PME" of OS driver setting.

USB Ports: USB

This product is equipped with 4 port for USB 2.0 interface.

Table 4.5. USB Connector

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

Serial Port Interface: SERIAL A - B

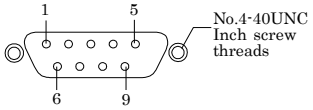
SERIAL A, B (RS-232C Ports)

The product has 2 ports 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 4.6. SERIAL A, B, C, D, E I/O Addresses and Interrupts

SERIAL	I/O address	Interrupt
A	3F8h - 3FFh	IRQ 4
B	2F8h - 2FFh	IRQ 3
C (touch panel)	2A0h-2A7h	IRQ5
D (system reserved)		
E (system reserved)		

Table 4.7. Serial Port Connector

Connector used on the product	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

DVI Interface: DVI

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

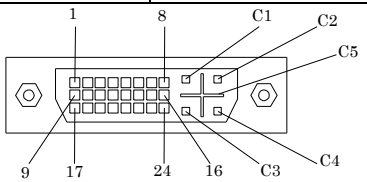
⚠ CAUTION

Precautions when Using Additional Display

- An additional display can be used to enable simultaneous screen display with the PANEL-PC main display.
- If the resolution of the additional display is different from that of the PANEL-PC main display, the size of screen images on the additional display will be decreased or increased with lower image quality.
- When using the main unit and touch panel function at the same time, use a USB connection for the touch panel.

Table 4.8. DVI Connector

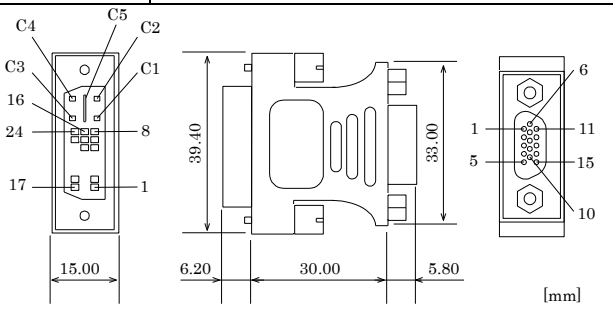
Connector type	DVI-I 29 pin



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

Table 4.9. DVI-analog RGB conversion adapter

Connector type	DVI-I 29 pin



Signal on analog RGB			
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	DDC DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC CLK
8	GND		

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

Display driver

Install the appropriate display 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

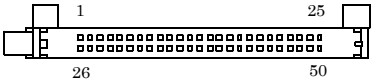
- You need to set the screen resolution if the display cable is not connected to this DVI-D interface at OS startup, but connected after OS startup (hereinafter referred to as “Late Insertion”).
- When the analog display is used, Windows MS-DOS may not be properly displayed in full-screen mode.
  This 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.

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 4.10. CF Card Connector

Connector used on the product	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	

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. If USB Keyboard Support is set to "Enabled", restart can be initiated by pressing the <Ctrl>, <Alt>, and <Delete> keys simultaneously. 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 Page Up and Page Down 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.

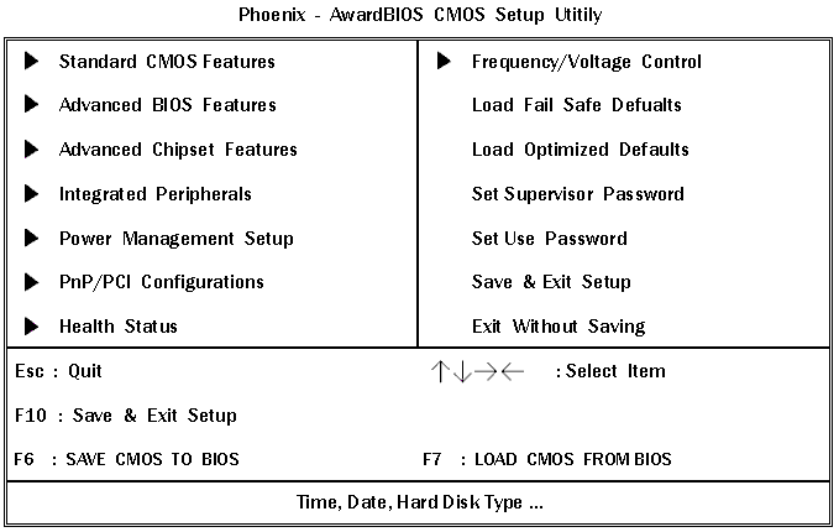


Figure 5.1. Main Manu

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

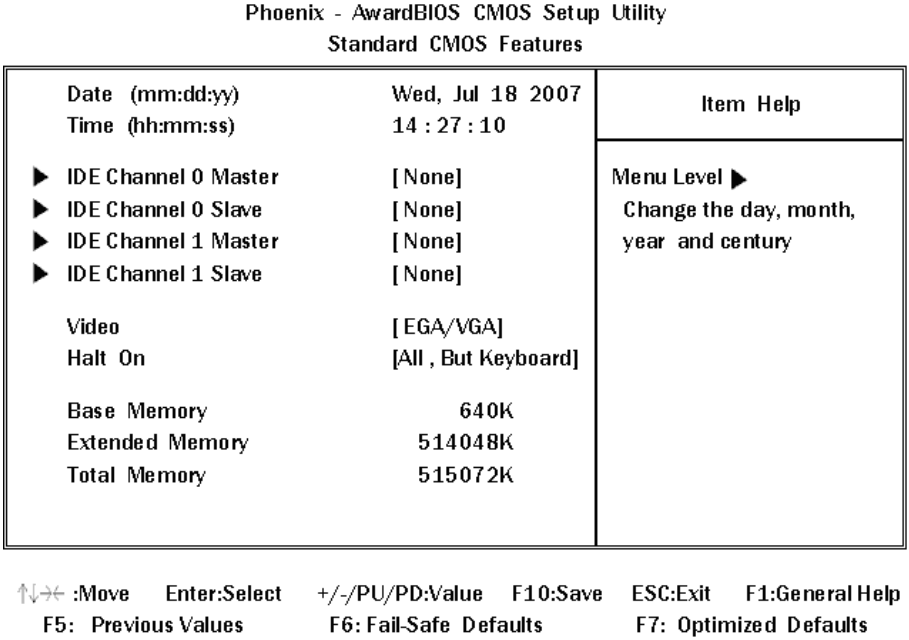


Figure 5.2. Standard CMOS Setup

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 Usually select EGA/VGA.
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

The IDE adapters control the CF card. Use a separate sub menu to configure each CF card.

Use the legend keys to navigate through this menu and exit to the main menu. Use Table 5.3 to configure the hard disk.

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 !
Access Mode	CHS LBA Large Auto	Choose the access mode for this CF card.
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.
The following options are selectable only if the 'IDE Channel 0/2 Master/Slave' item is set to 'Manual' and 'CHS' 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.

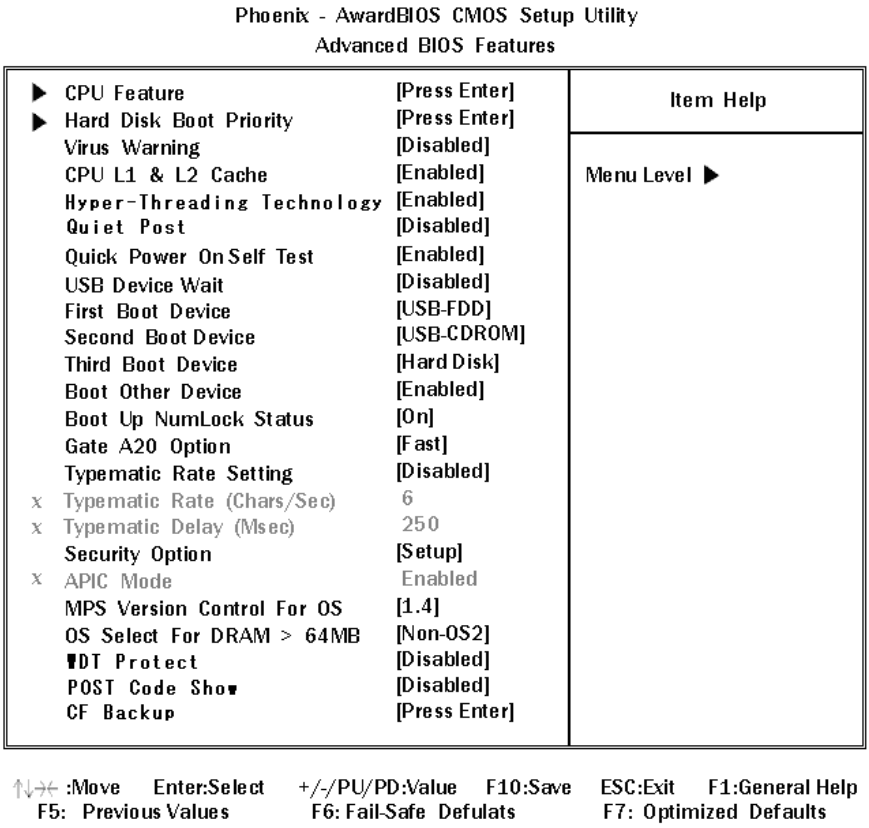


Figure 5.3. Advanced BIOS Features Setup

CPU Feature

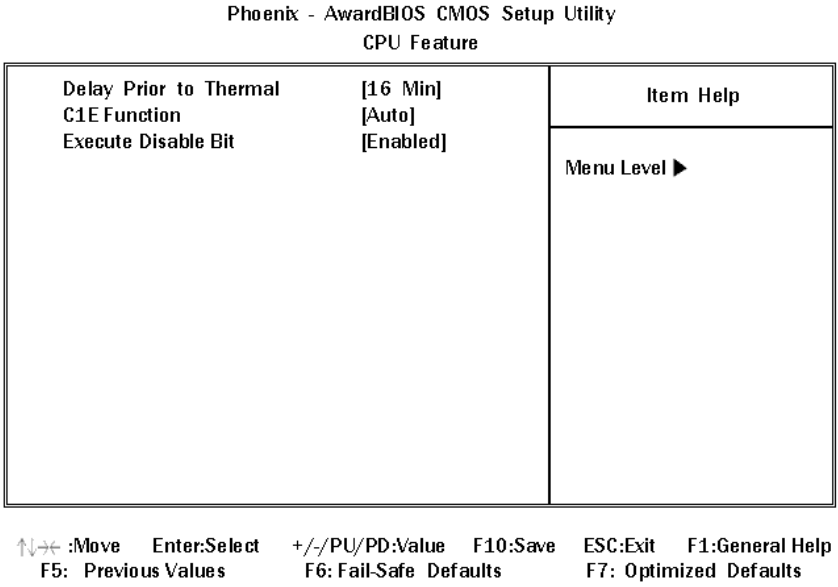
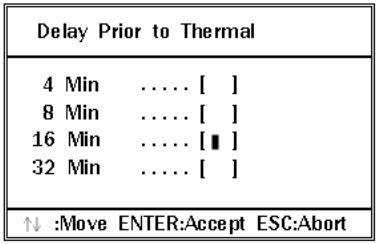
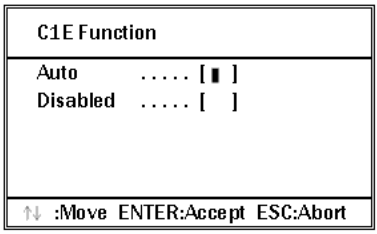
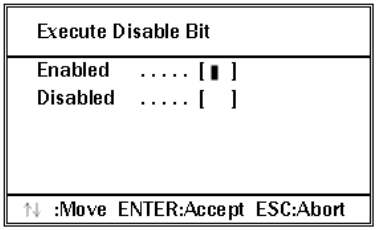


Figure 5.4. CPU Feature

Press <Enter> to configure the settings relevant to CPU Feature.

Table 5.4. CPU Features Selections

Description	Choice
Delay Prior to Thermal Select the interval to setup the delay timer for CPU Thermal-Throttling.	
C1E Function CPU C1E Function Select.	

Description	Choice
Execute Disable Bit When disabled, forces the XD feature flag to always return 0.	

Hard Disk Boot Priority

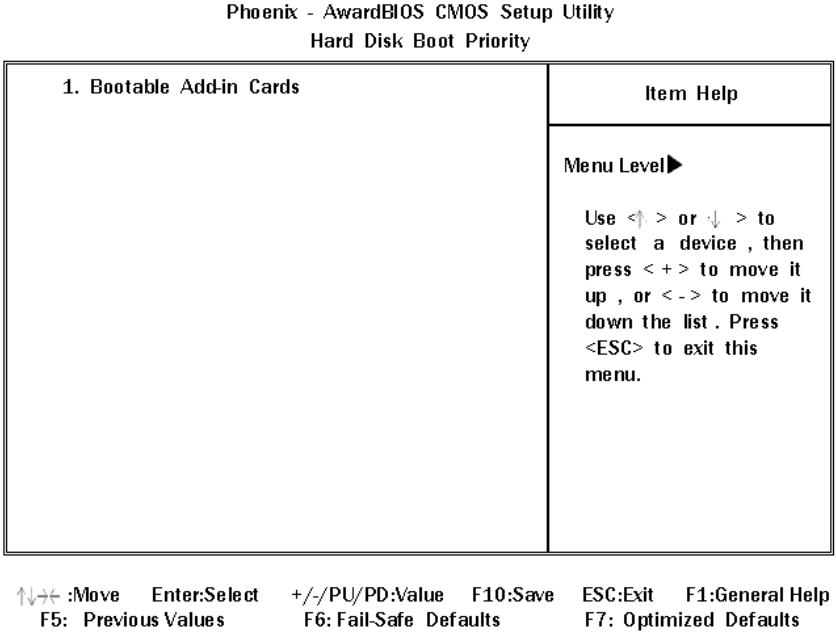


Figure 5.5. Hard Disk Boot Priority

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

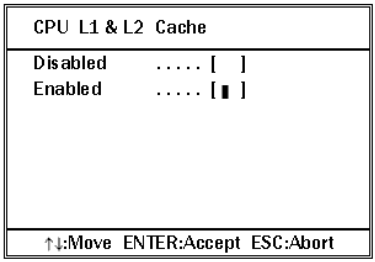
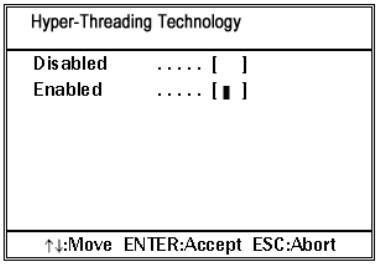
When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

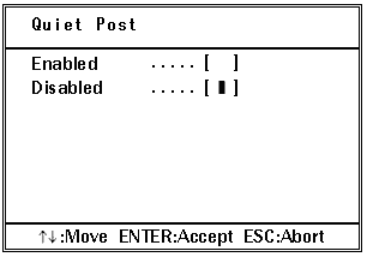
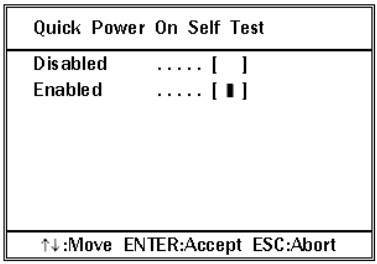
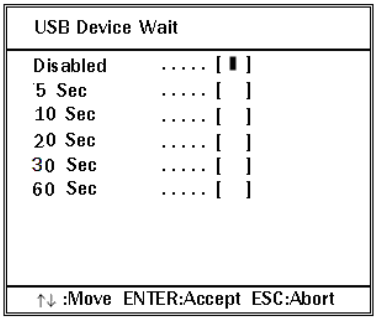
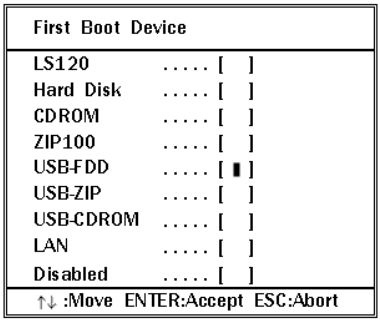
⚠ CAUTION

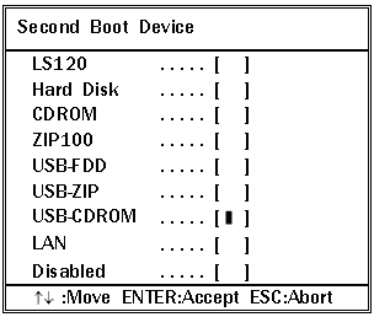
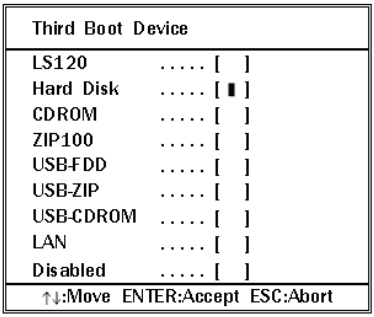
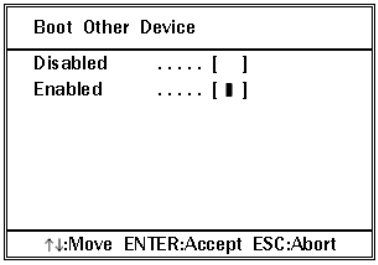
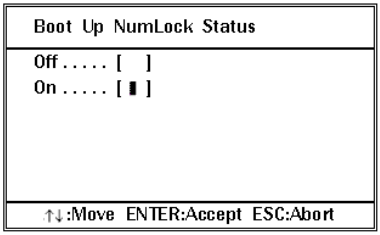
Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.

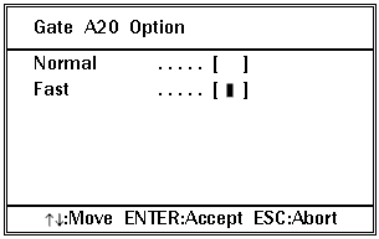
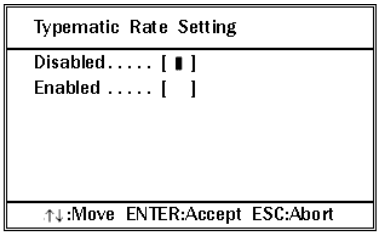
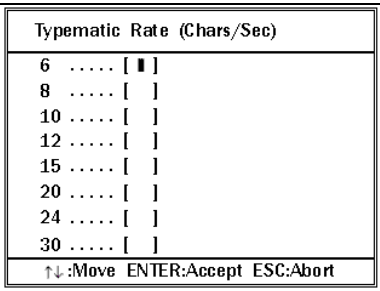
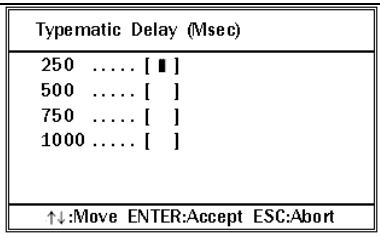
Enabled	Activates automatically when the system boots up causing a warning message to appear when any−thing attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

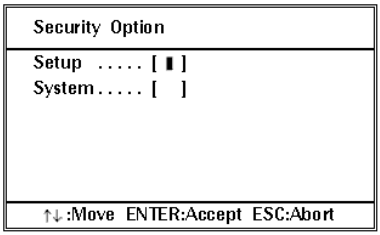
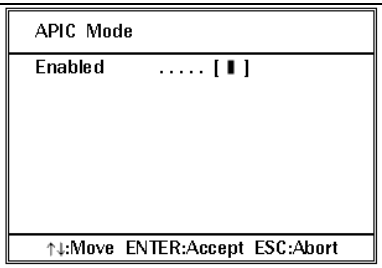
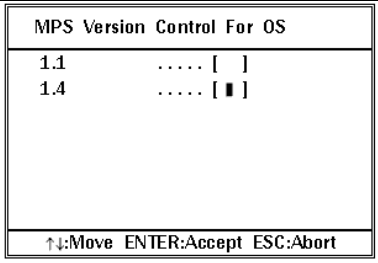
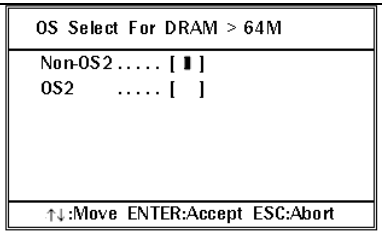
Table 5.5. Advance BIOS Feature Selections

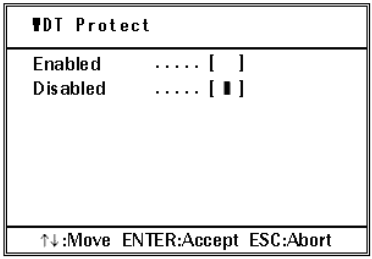
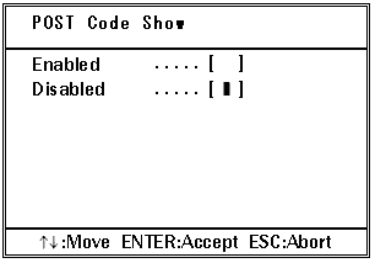
Description	Choice
CPU L1 & L2 Cache These allow you to enable (speed up memory access) or disable the cache function.	
Hyper-Threading Technology These allow you to enable or disable the Hyper-Threading function.	

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 The BIOS attempts to load the operating system from the devices in the sequence selected in these items.	
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.	
OS Select For DRAM > 64M Select the operating system that is running with greater than 64MB of RAM on the system.	

Description	Choice
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.	
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. Please check the OS license that is included in this product.

Followings are the steps to use the CF Backup feature.

<Using the CF Backup Feature>

(1) Connect 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.

If backup is performed to a same type CF as the current CF, the contents of the backup CF becomes the same as the current CF. Therefore the backup CF can be used as it is in place of the current CF.

If backup is performed to a CF whose capacity is larger than the current CF, the backup CF cannot be used as it is. The backed-up contents can be used after being transferred to a CF of the same type as the current CF. For the transfer procedure, refer to “How to use CF Backup function” described above.

Advanced Chipset Features Setup

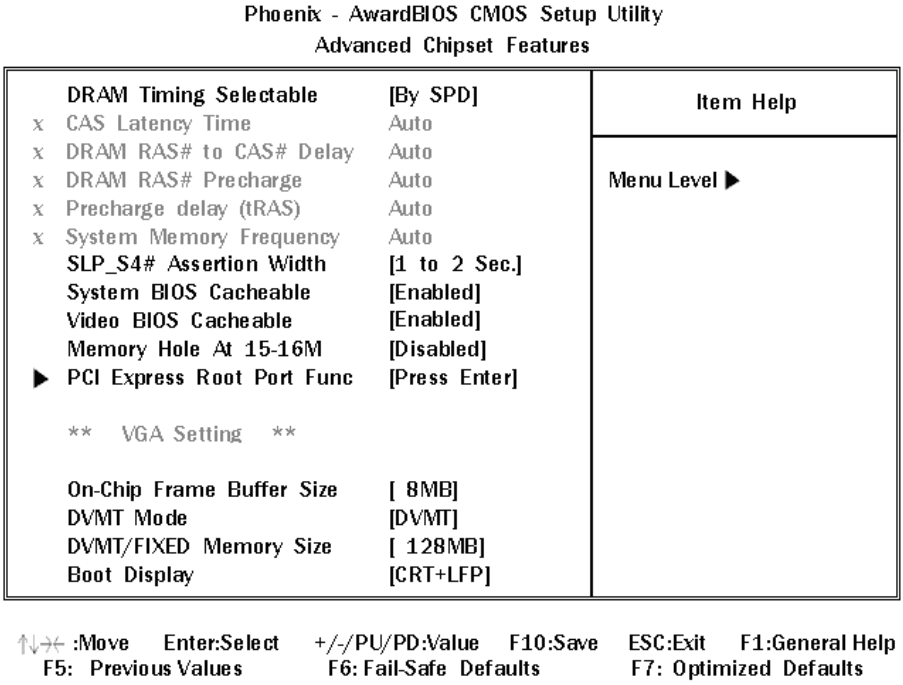
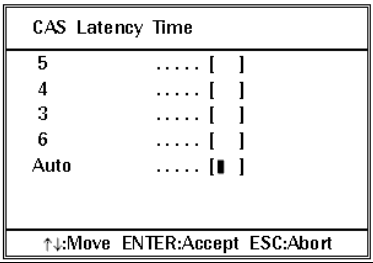
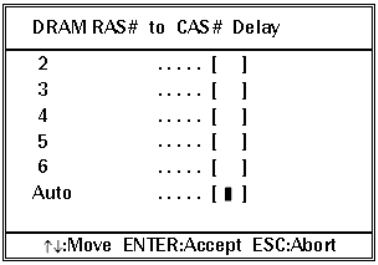
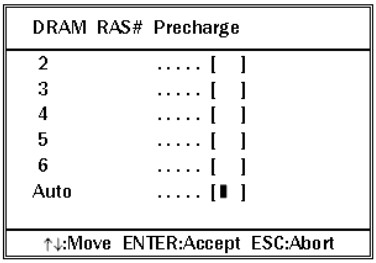
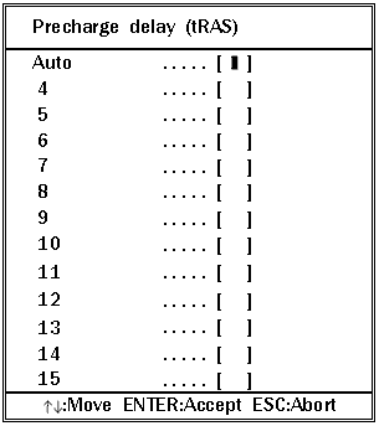


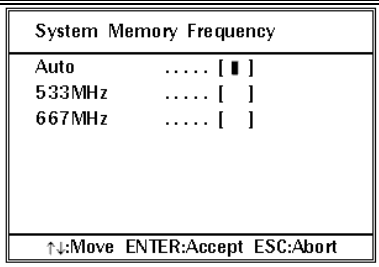
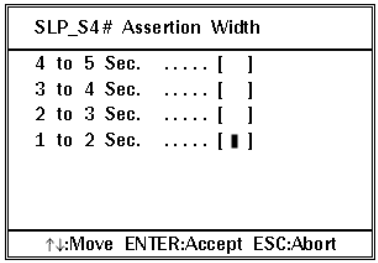
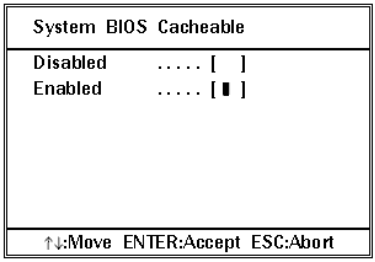
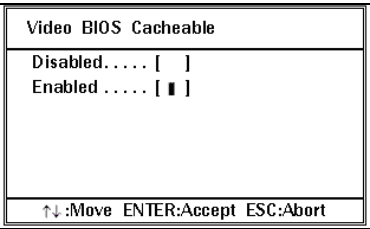
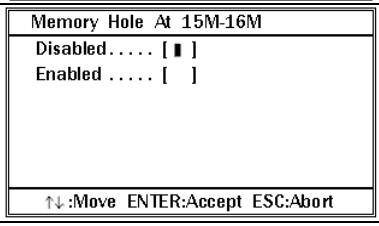
Figure 5.6. Advanced Chipset Features Setup

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

Table 5.6. Advance Chipset Feature Selections

Description	Choice
DRAM Timing Selectable The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unlees you install new memory that has a different performance rating than the original DRAMs.	DRAM Timing Selectable Manual ..... [ ] By SPD ..... [▮] ↑↓:Move ENTER:Accept ESC:Abort

Description	Choice
CAS Latency Time When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer. You can select CAS latency time in HCLK of 3/4/5/6 or Auto. The system board designer should set the values in this field, depends on the DRAM installed specifications of the installed DRAM or the installed CPU.	
DRAM RAS# to CAS# delay This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.	
DRAM RAS# Precharge The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.	
Precharge delay (tRAS) This item controls the number of DRAM clocks to activate the precharge delay. The default setting for the DRAM Cycle time tRAS is Auto.	

Description	Choice
System Memory Frequency This item sets the main memory frequency.	
SLP_S4# Assertion Width Allows you to set the SLP_S4# assertion width. The default setting is 1 - 2 Sec.	
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.	
Memory Hole At 15M-16M This setting does not normally need to be configured. Please use the product with this setting set to Disabled.	

PCI Express Root Port Function

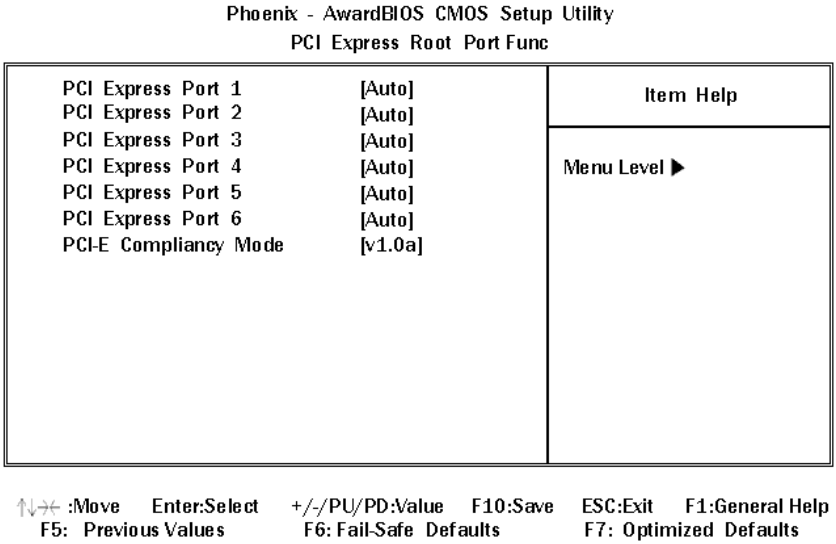
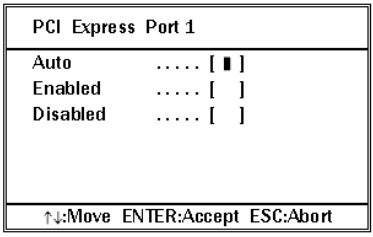
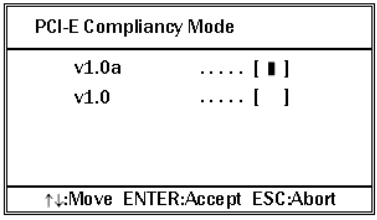


Figure 5.7. PCI Express Root Port Function

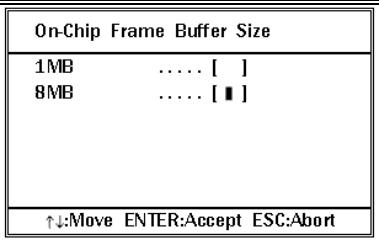
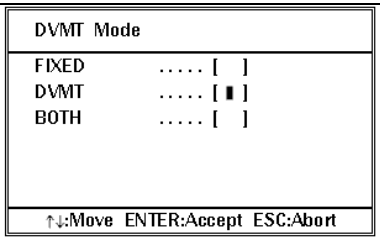
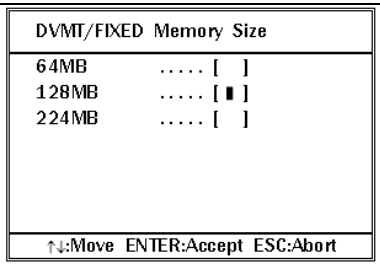
Table 5.7. PCI Express Root Port Function Selections

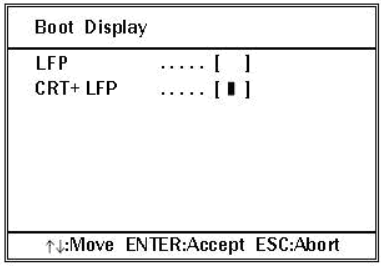
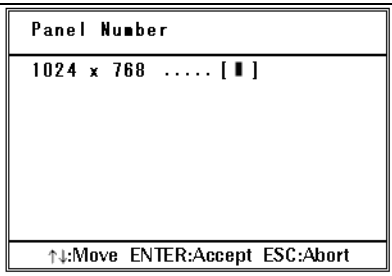
Description	Choice
PCI Express Port 1/2/3/4/5/6 This item allows you to enable or disable or Auto configure the PCI Express Port 1/2/3/4/5/6.	
PCI-E Compliancy Mode This item allows you to set PCI Express compliancy mode.	

VGA setting

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

Table 5.8. VGA Setting Selections

Description	Choice
On-Chip Frame Buffer Size When Enabled, a fixed VGA frame buffer from A000h to BFFFh and a CPU-to-PCI write buffer are implemented.	
DVMT Mode Allows you to set the Dynamic Video Memory Technology (DVMT) mode.	
DVMT/FIXED Memory Size Allows you to set the Dynamic Video Memory Technology (DVMT) memory size.	

Description	Choice
Boot Display This item allows you to select the boot display device.	
Panel Number Resolution of the LFP (the display part of the main body) is fixed to 1024 x 768. Notes: This is the sole item shown.	

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.

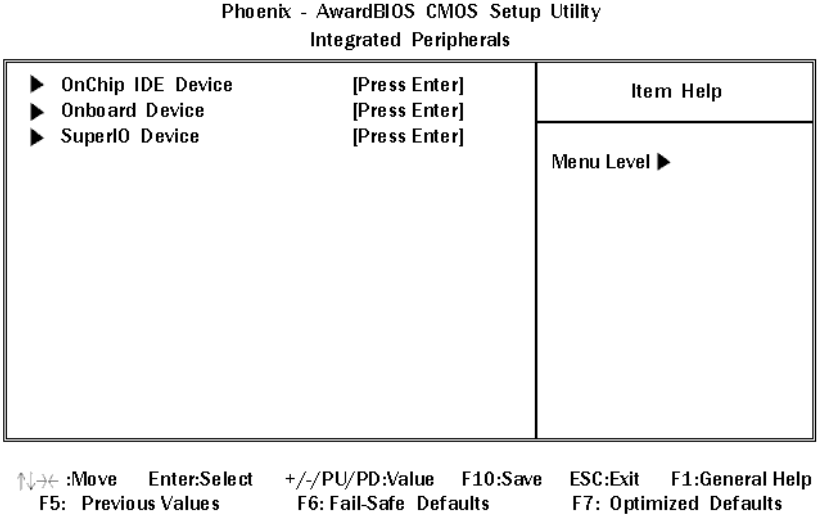


Figure 5.8. Integrated Peripherals

OnChip IDE Device

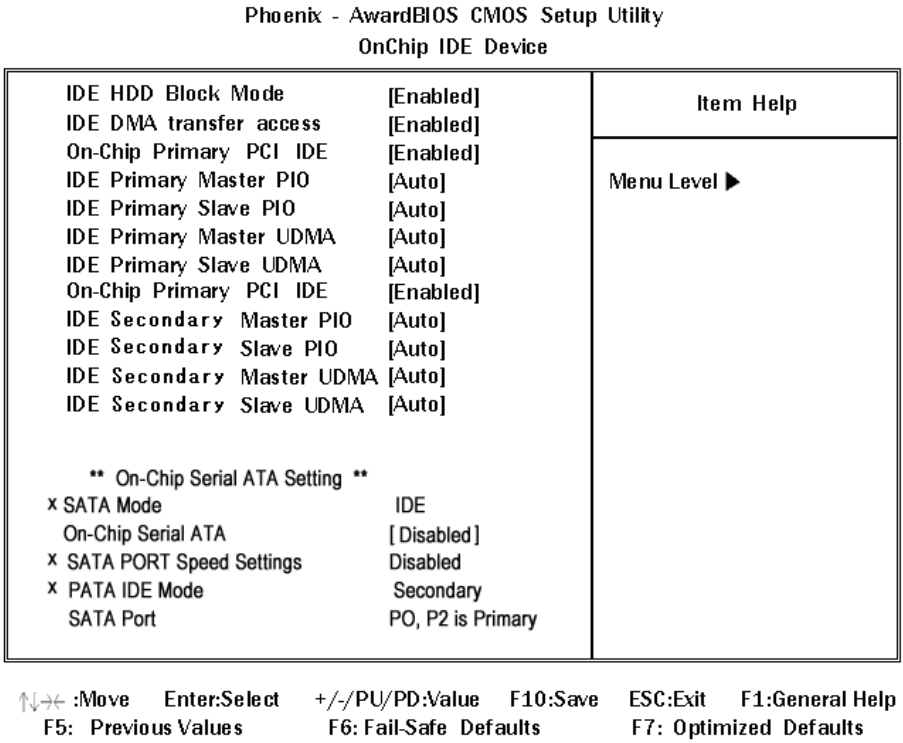
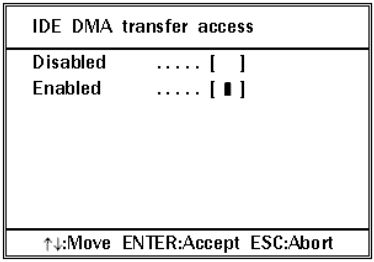
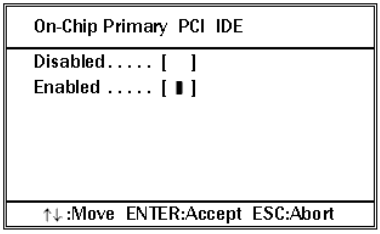
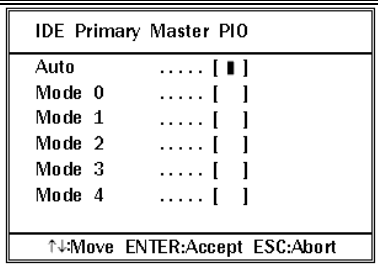
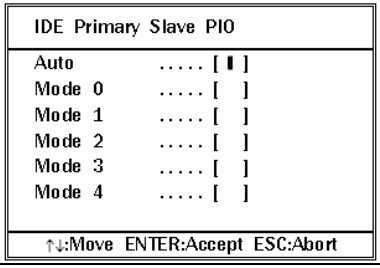
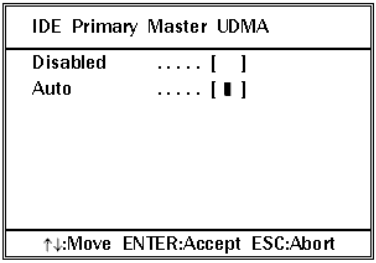
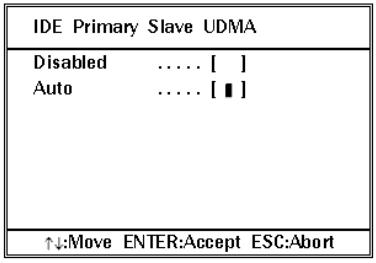
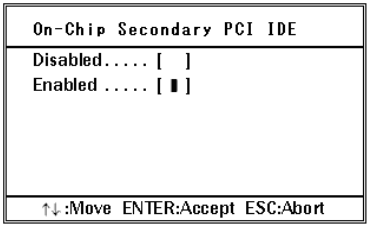


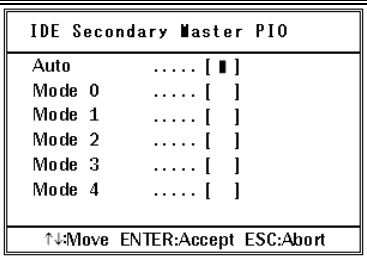
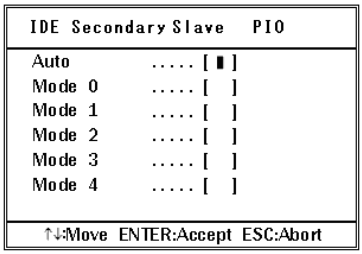
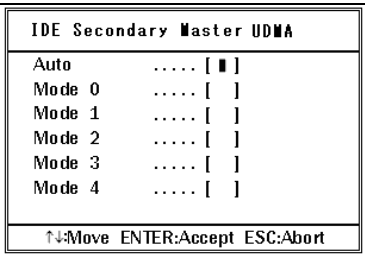
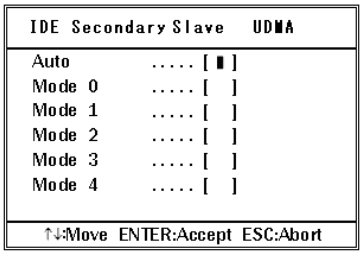
Figure 5.9. OnChip IDE Device

Table 5.9. 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 your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.	IDE HDD Block Mode Disabled ..... [ ] Enabled ..... [■] ↑↓:Move ENTER:Accept ESC:Abort

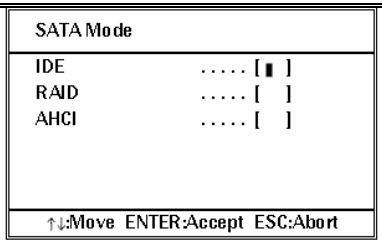
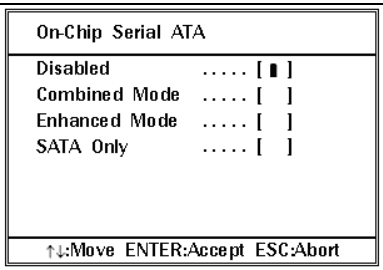
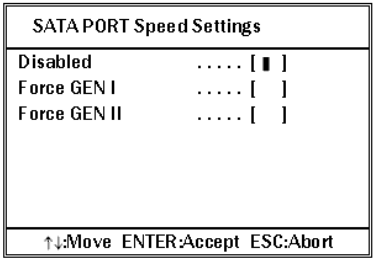
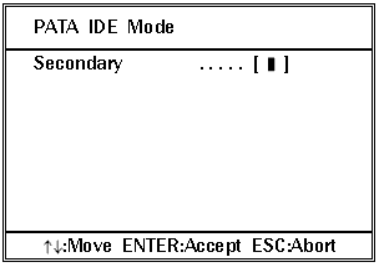
Description	Choice
IDE DMA transfer access This item allows you to enable or disable the IDE DMA transfer access.	
On-Chip Primary PCI IDE The integrated peripheral controller contains an IDE interface with support for 2 IDE channels. Select Enabled to activate each channel separately.	

Description	Choice
IDE Primary Master / Slave PIO The two IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for the one IDE device that the onboard IDE interface supports. In Auto mode, the system automatically determines the best mode for the device.	 
IDE Primary Master/Slave UDMA UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select Auto in the two IDE UDMA fields, the system automatically determines the optimal data transfer rate for each IDE device.	 
On-Chip Secondary PCI IDE The integrated peripheral controller contains an IDE interface with support for 2 IDE channels. Select Enabled to activate each channel separately.	

Description	Choice
IDE Secondary Master / Slave PIO The two IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for the one IDE device that the onboard IDE interface supports. In Auto mode, the system automatically determines the best mode for the device.	 
IDE Secondary Master/Slave UDMA UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select Auto in the two IDE UDMA fields, the system automatically determines the optimal data transfer rate for each IDE device.	 

On Chip Serial ATA setting

Table 5.10. On Chip Serial ATA Setting Selection

Description	Choice
SATA Mode SATA mode is fixed to IDE.	
On-Chip Serial ATA Disabled: Disable SATA controller. Combined Mode: Enable the combination of SATA and PATA. Up to three IDE devices are available, one for SATA and two for PATA. Enhanced Mode: Enable both SATA and PATA. Up to three IDE drives are provided for this mode. SATA Only: Set SATA to operate in legacy mode.	
SATA PORT Speed Settings Disable speed settings of, or forcibly set “GEN I” or “GEN II” to the SATA port.	
PATA IDE Mode PATA IDE mode is fixed to “Secondary”.	

Description	Choices
SATA Port Set serial ATA channel to “Primary”. Notes : Only this item is displayed.	SATA Port P0, P2 is Primary ↑↓:Move ENTER:Accept ESC:Abort

Onboard Device

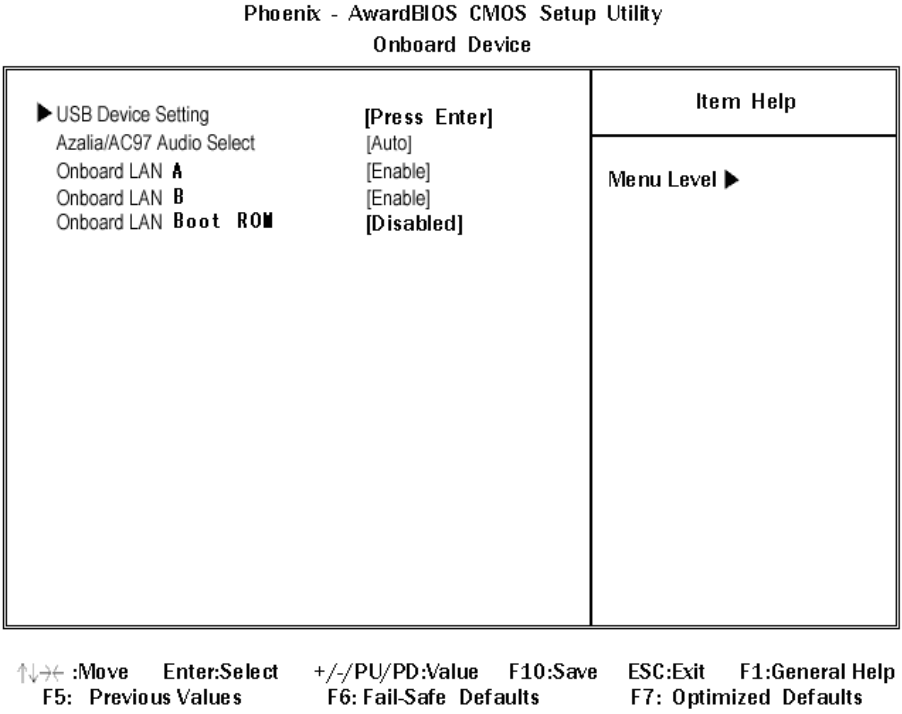


Figure 5.10. Onboard Device

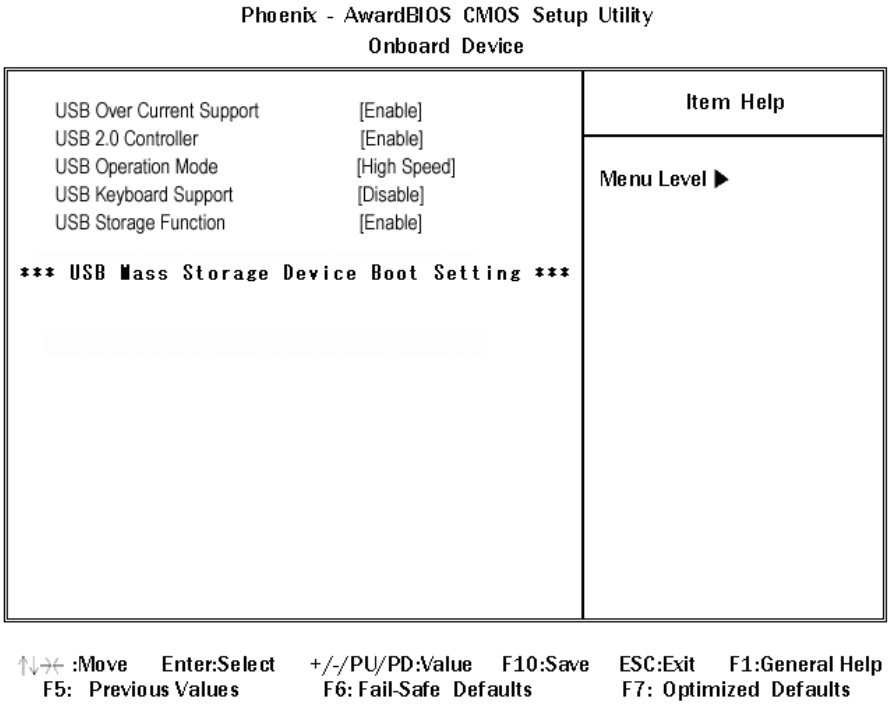
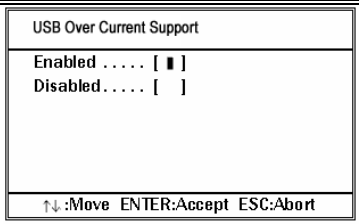
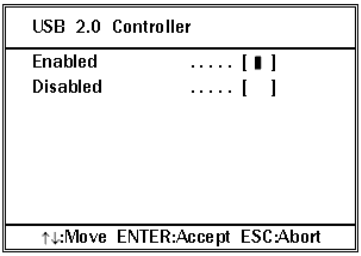
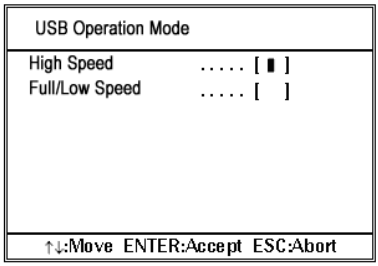
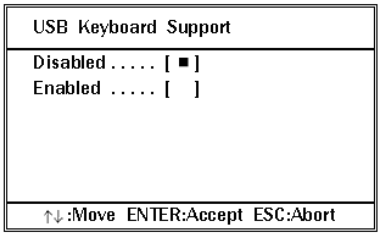
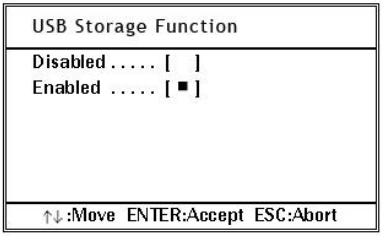
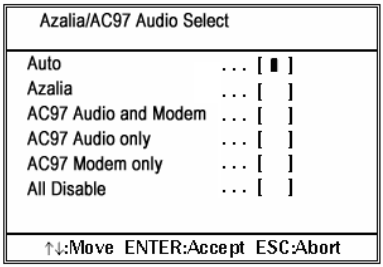
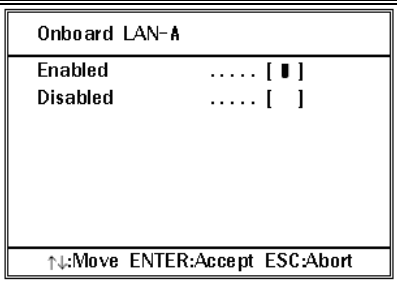
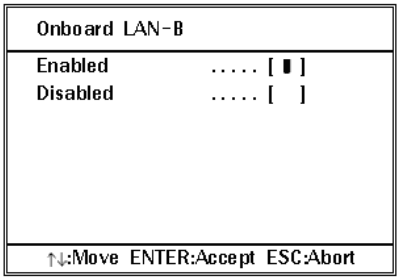
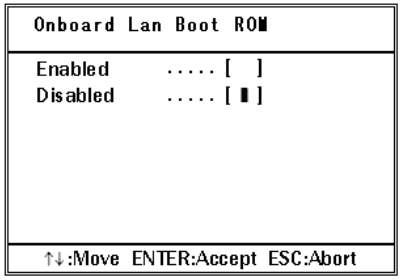


Figure 5.11. USB Device Setting

Table 5.11. On board device Selections

Description	Choice
USB Over Current Support Enable or disable the USB Over Current. In normal cases, set it as "Enabled".	
USB 2.0 Controller Enable or disable the Onboard USB 2.0 function. In normal cases, use it while "Enable".	

Description	Choice
USB Operation Mode Select one of USB operation mode.	
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. Using OS which supports USB such as Windows XP, you can use USB storages even if this item is set to "Disabled".	
Azalia/AC97 Audio Select Select audio function and/or enable or disable device(s). In normal cases, set it as "Auto".	

Description	Choice
Onboard LAN-A Select “Disabled” if you don’t want to use Onboard LAN A controller.	
Onboard LAN-B Select “Disabled” if you don’t want to use Onboard LAN B controller.	
Onboard Lan Boot ROM Select “Enabled” when PXE network boot up is to be performed.	

Super IO Device

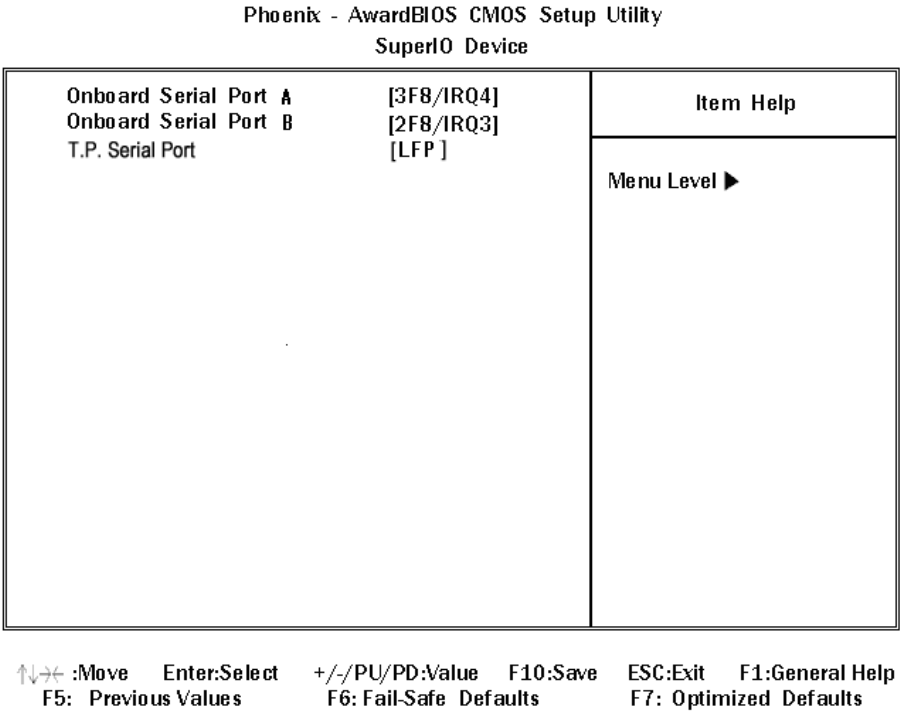
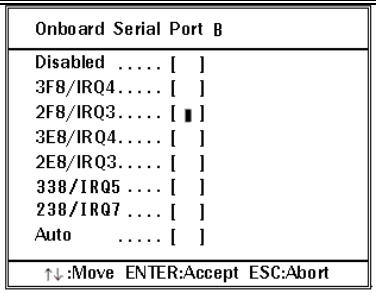
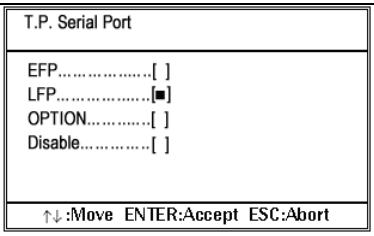


Figure 5.12. Super IO Device

Table 5.12. Super I/O device Selections

Description	Choice
Onboard Serial Port A Select an address and corresponding interrupt for the serial port A.	Onboard Serial Port A Disabled ..... [ ] 3F8/IRQ4..... [ ] 2F8/IRQ3..... [ ] 3E8/IRQ4..... [ ] 2E8/IRQ3..... [ ] 338/IRQ5 .... [ ] 238/IRQ7 .... [ ] Auto ..... [ ] ↑↓:Move ENTER:Accept ESC:Abort

Description	Choice
Onboard Serial Port B Select an address and corresponding interrupt for the serial port B.	
T.P. Serial Port Enable or disable touch panel serial port. Select LFP when you use the touch panel of the main body.	

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.

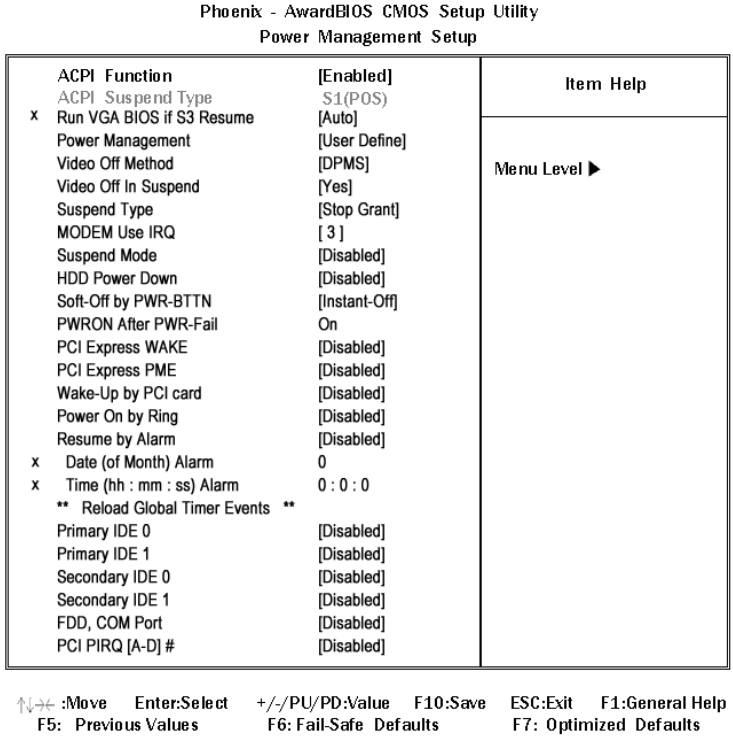
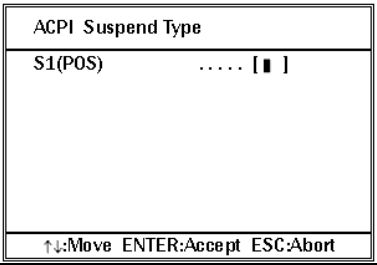
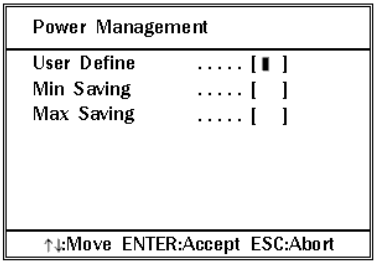
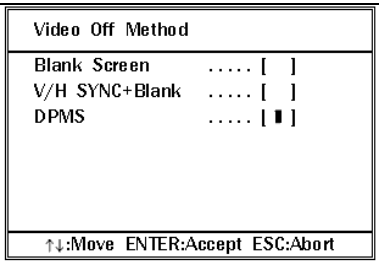
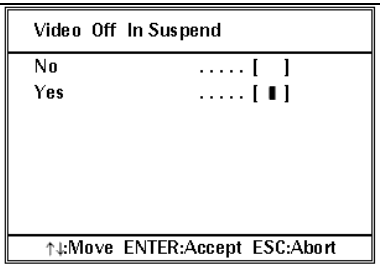
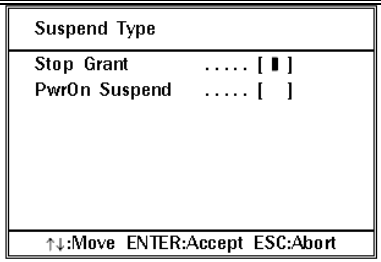
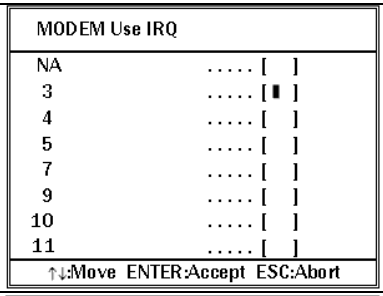
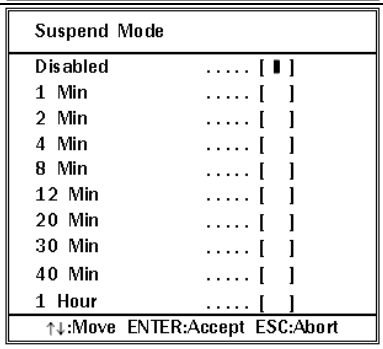


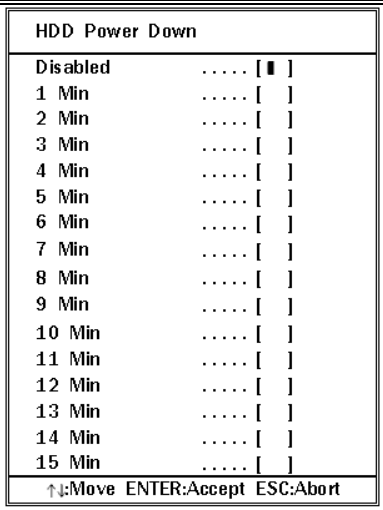
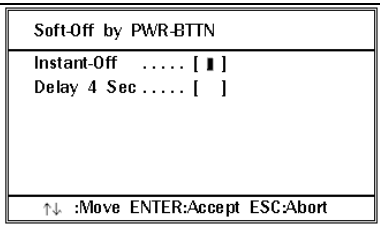
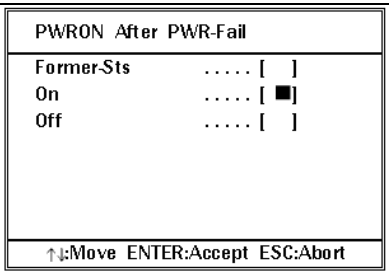
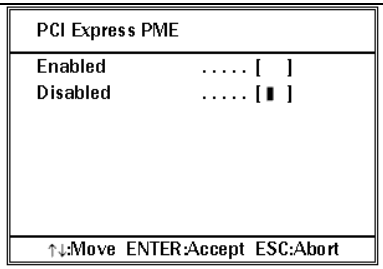
Figure 5.13. Power Management Setup

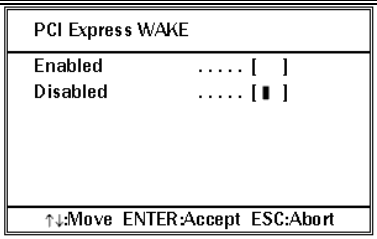
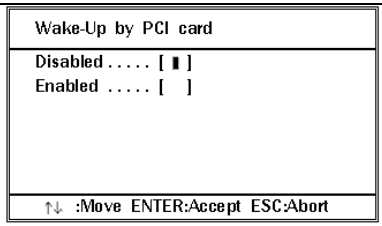
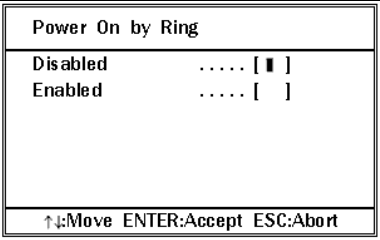
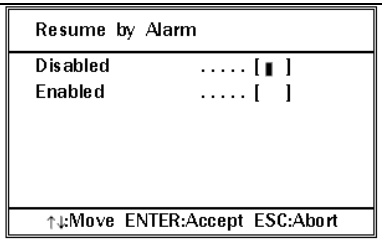
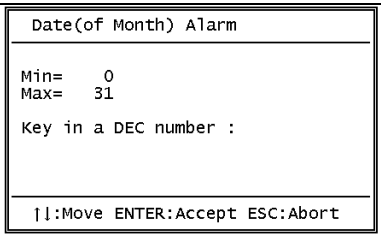
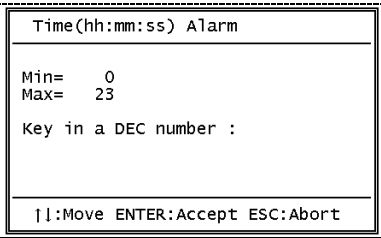
Table 5.13. Power Management setup Selections

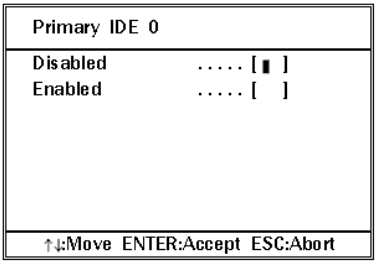
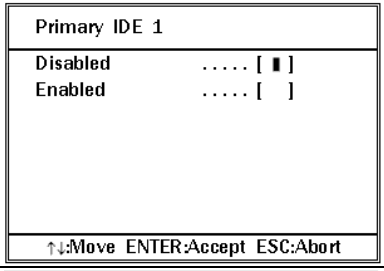
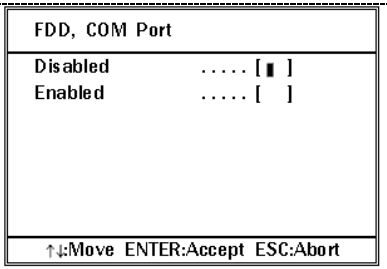
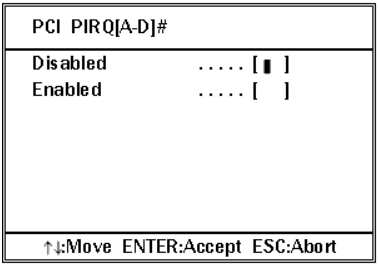
Description	Choice
ACPI Function When set to 'Enabled', turns on the ACPI Function. By default, this field is "Enabled". If you change this value after Windows Installation, you should install OS again.	ACPI Function Enabled ..... [■] Disabled ..... [ ] ↑↓ :Move ENTER:Accept ESC:Abort
Note: ACPI (Advanced 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. It also allows the computer to be turned on and off by external devices, so that mouse or keyboard activity wakes up the computer.	

Description	Choice
ACPI Suspend Type Only "S1 (POS)" is supported for the ACPI suspense mode.	
Power Management This setting controls the timer function of the doze mode, the standby mode, and the suspend mode respectively. Use this category to select the type (degree) of power-saving feature. **User Define:** Each mode can be set respectively. Setting range of an enabled mode is 1 minute to 1 hour. (Exception: Setting range of HDD power down is 1 minute to 15 minutes.) **Min Saving:** Power management is set to the minimum (standby mode = 1 hour, suspend mode = 1 hour, and HDD power down = 15 minutes). **Max Saving:** Power management is set to the maximum (standby mode = 1 minute, suspend mode = 1 minute, and HDD power down = 1 minute).	
Video Off Method Select the method to blank the monitor. **Blank Screen:** This option writes a blank in the video buffer. **V/H SYNC+Blank:** This option turns off power of the vertical and horizontal synchronization ports and writes a blank in the video buffer. **DPMS:** Display initial power management signal	
Video Off In Suspend Select the method to turn off the monitor screen.	

Description	Choice
Suspend Type Enable the selected option. The options are “Stop Grant” and “PwrOn Suspend”.	
MODEM Use IRQ To resume the system automatically from the power saving mode in answer to an incoming call to the modem, select the interrupt request line (IRQ). To use this function, it may be necessary to connect the Fax/modem to the Wake On Modem connector of the keyboard computer.	
Suspend Mode If no power management event occurs within the selected time period, the CPU clock stops and the video signal turns to be suspended. When a power management event is detected, the full power function returns. *When the USB Keyboard Support item is set to [Enabled], this function cannot be used.	

Description	Choice
HDD Power Down When an option other than “Disabled” is selected, the hard disc drive turns to power saving mode if there is no system operation for the selected time period. In such case, other devices remain active.	
Soft-Off by PWR-BTTN In case of Soft-Off (S5) by the power button, specifies the delay time to wait till the power button takes effect. In “Instant-Off”, the power button takes effect immediately after pushed down. In “Delay 4 sec”, the power button needs to be pushed and held for 4 seconds to take effect. Note that the power button is controlled by the OS in case of Windows.	
PWRON After PWR-Fail Only “On” is supported for the PWRON After PWR-Fail. This feature is activated whenever a power is returned after any types of power failures such as outage.	
PCI Express PME By default, this field is Disabled. For Add on PCI-E Card PME. Usually select “Disabled”.	

Description	Choice
PCI Express WAKE By default, this field is "Disabled". Selecting "Enable" enables On board LAN "WOL" function. Note that the "Wake-Up by PCI Card" setting below should be Enable alike.	
Wake-Up by PCI card Selecting "Enable" enables On board LAN "WOL" function. Note that the "PCI Express Wake" setting below should be Enable alike.	
Power On by Ring When set to "Enabled", you can boot the system by incoming call (Ring signal) to the modem connected SERIAL A or SERIAL B.	
Resume by Alarm When Enabled, your can set the date and time at which the RTC (real-time clock) alarm awakens the system.	
	

Description	Choice
Reload Global Timer Events : When Enabled, an event occurring on each listed device restarts the global timer for Standby mode.	
	
	

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.

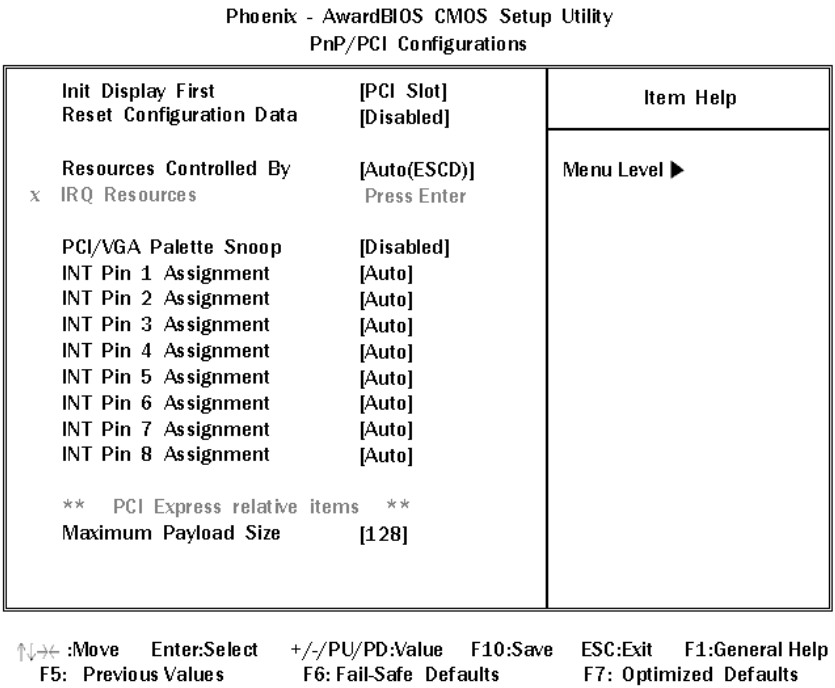
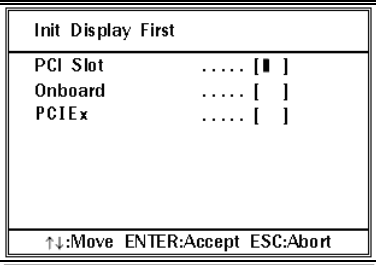
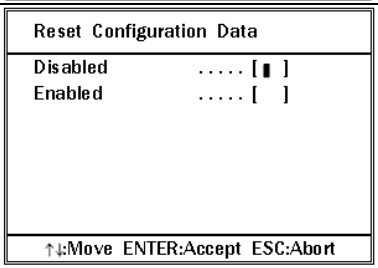
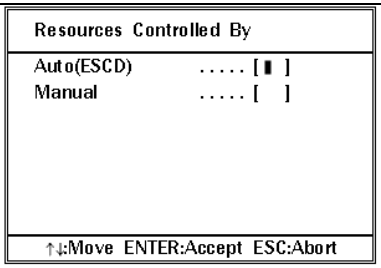


Figure 5.14. PnP/PCI Configuration Setup

Table 5.14. PCI PnP/PCI Configuration Setup Selections

Description	Choices
Init Display First Initialize the onboard video display before initializing any other display device on the system. Thus the onboard display becomes the primary display.	
Reset Configuration Data Normally, you leave this field Disabled. When you want to reset the resource assignment for the change of Enable / Disable of COM or other reasons, set this field to Enabled. After BIOS setup, ESCD (Extended System Configuration Data) should be reset.	
Resource Controlled by The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play – compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.	

IRQ Resources

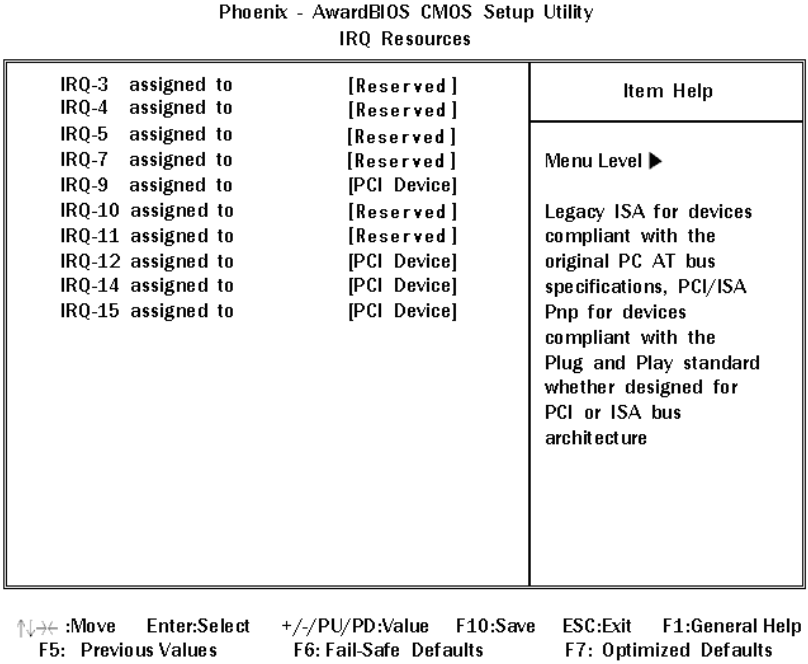


Figure 5.15. IRQ n Resources

When resources are controlled manually, assign each system interrupt as on of the following type, depending on the type of device using the interrupt.

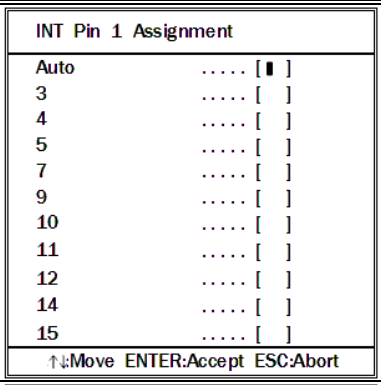
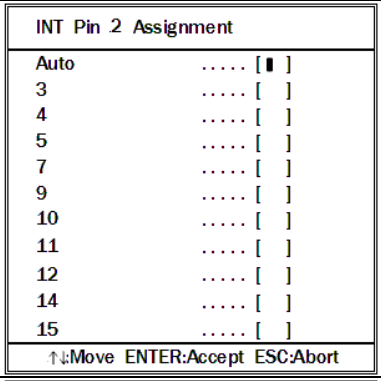
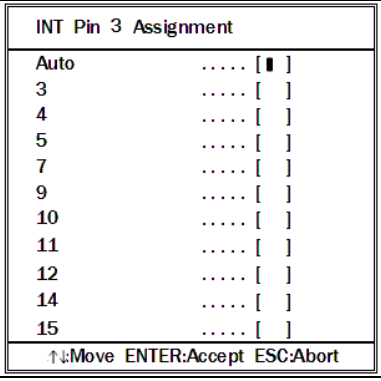
Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ4 for serial port A)

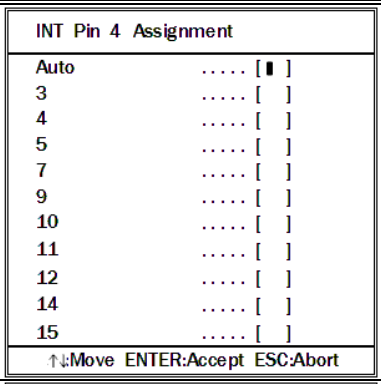
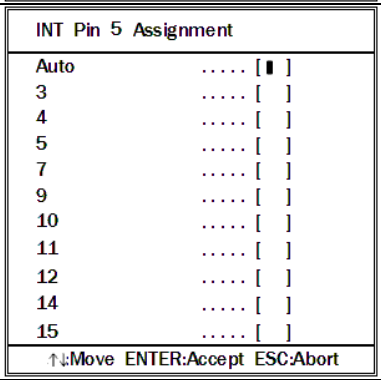
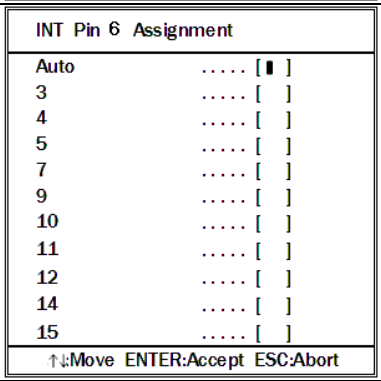
PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

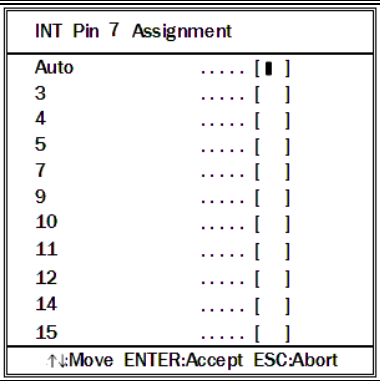
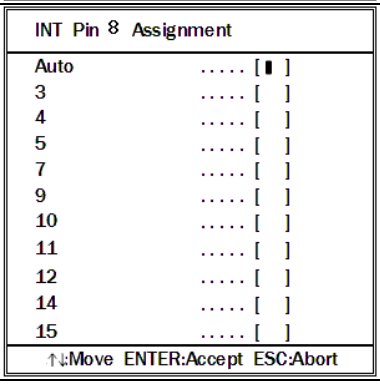
The Choice: Legacy ISA and PCI/ISA PnP

Table 5.15. IRQ n Resources Selections

Description	Choices
PCI/VGA Palette Snoop This function is not supported. Keep this value “Disabled”.	PCI/VGA Palette Snoop Disabled . . . . . [ ] Enabled . . . . . [ ] ↑↓:Move ENTER:Accept ESC:Abort

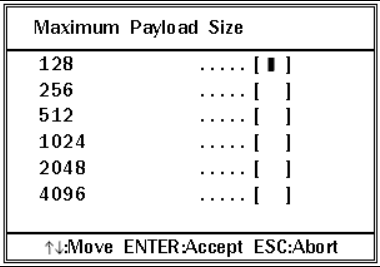
Description	Choices
INT Pin 1 Assignment Usually select “Auto”. Devices(s) using this INT ： Display Controller - Bus 0 Dev 2 Func 0 USB 1.0/1.1 UHCI Controller - Bus 0 Dev 29 Func 3	
INT Pin 2 Assignment Usually select “Auto”. Devices(s) using this INT ： Multimedia Device - Bus 0 Dev 30 Func 2	
INT Pin 3 Assignment Usually select “Auto”. Devices(s) using this INT ： USB 1.0/1.1 UHCI Controller - Bus 0 Dev 29 Func 2	

Description	Choices
INT Pin 4 Assignment Usually select “Auto”. Devices(s) using this INT ： IDE Controller - Bus 0 Dev 31 Func 2 USB 1.0/1.1 UHCI Controller - Bus 0 Dev 29 Func 1 SMBus Controller - Bus 0 Dev 31 Func 3	
INT Pin 5 Assignment Usually select “Auto”. Devices(s) using this INT ： Network Controller - Bus 1 Dev 8 Func 0 Simple Communication Controller - Bus 0 Dev 30 Func 3	
INT Pin 6 Assignment Usually select “Auto”. Devices(s) using this INT ： - Reserved	

Description	Choices
INT Pin 7 Assignment Usually select “Auto”. Devices(s) using this INT ： - Reserved	
INT Pin 8 Assignment Usually select “Auto”. Devices(s) using this INT ： USB 1.0/1.1 UHCI Controller - Bus 0 Dev 29 Func 0 USB 2.0 EHCI Controller - Bus 0 Dev 29 Func 7	

PCI Express relative items

Table 5.16. PCI Express Relative Items Selections

Description	Choices
Maximum Payload Size Supported maximum TLP payload size (byte) for the PCI Express Devices is 128 only. Keep this value 128.	

PC Health Status

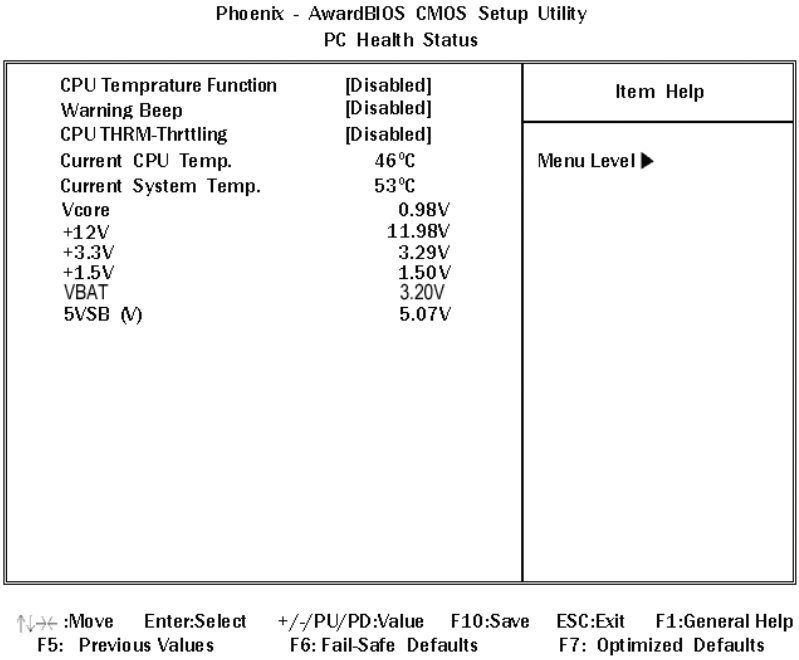
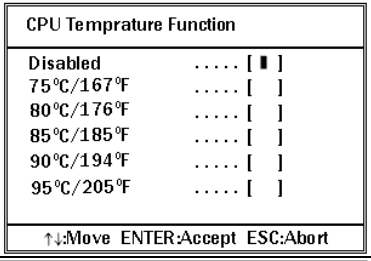
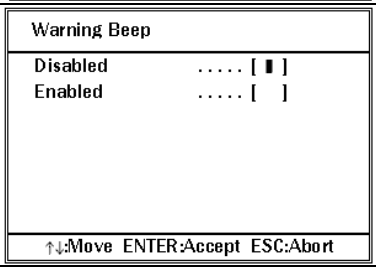
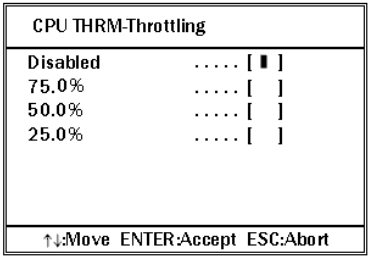


Figure 5.16. PC Health Status

The BIOS shows the PC health status in this window.

Table 5.17. PC Health Status Selections

Description	Choices
CPU Temperature Function When using "Warning Beep" and "CPU THRM-Throttling" below, specifies the threshold temperature to the CPU temperature.	
Warning Beep Disabled: Disables this function. Enabled: Beep will sound as a warning when the temperature exceeds the value set in "CPU Temperature Function" above.	
CPU THRM-Throttling When the temperature exceeds the value set in "CPU Temperature Function" above, the slot ring is activated in selected percentages to restrain the heat generation from CPU. Note that the operation in Windows is not supported.	
Current CPU Temp.	This field displays the current CPU temperature.
Current System Temp.	This field displays the current system temperature.
Vcore / +12V / +3.3V / +1.5V / VBAT / 5VSB	This field displays the current voltage.

Frequency/Voltage Control

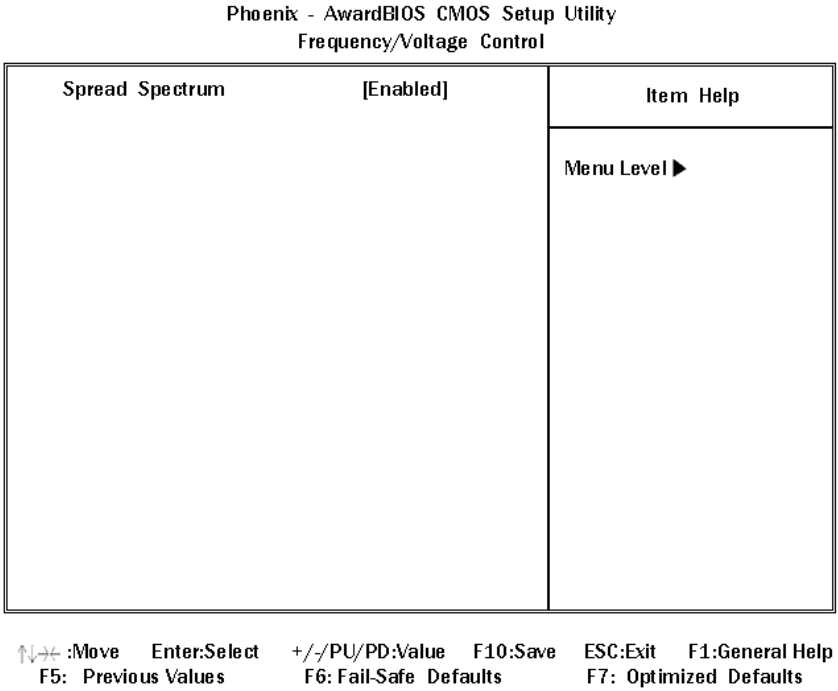


Figure 5.17. Frequency/Voltage Control

Table 5.18. Frequency/Voltage Control Selections

Description	Choices
Spread Spectrum When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme values from spikes to flat curves, thus reducing EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.	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 failed

[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. Make sure the connection of boot drive and its content.

Error encountered initializing hard drive

Disk drive cannot be initialized. Be sure all recording media such as HDD/SSD/CF are installed correctly. Also be sure the correct hard drive type is selected in Setup.

Error initializing hard disk controller

Cannot initialize disk drive controller. Be sure all recording media such as HDD/SSD/CF are installed correctly. Also be sure the correct hard drive type is selected in Setup.

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 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)

Disk drive reset failed.

Hard disk(s) fail (40)

Disk drive controller diagnostics failed.

Hard disk(s) fail (20)

Disk drive initialization error.

Hard disk(s) fail (10)

Unable to recalibrate disk drive.

Hard disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out – Unlock the key

This product does not support Keyboard Lock. If this message was shown, keyboard controller may be broken.

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 indicates that hardware broke down or content of ROM was changed.

Memory test fail

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

Error loading operating system

Invalid System disk

It indicates that Boot Record Program in Disk (not in BIOS) failed to load OS. Make sure content of Disk.

6. Appendix

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
FEC0000h - FECFFFFFh, FEE00000h - FEEFFFFFh	APIC configuration space
FFE0000h - FFFFFFFFh	High BIOS Area

Figure 6.1. Memory Map

I/O Port Addresses

Table 6.1. 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
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
0290 - 029F	16 bytes	Hardware monitor
02A0 - 02A7	8 bytes	Touch panel (SERIAL C)
02A8 - 02AF	8 bytes	Reserved
02B0 - 02B7	8 bytes	Reserved
02C0 – 02C7	8 bytes	Reserved
02C8 – 02CF	8 bytes	Reserved
02F8 - 02FF	8 bytes	SERIAL B
0388 - 038D	6 bytes	Reserved (FM synthesizer)
03B0 - 03BB	12 bytes	Video (Monochrome)
03C0 - 03DF	32 bytes	Video (VGA)
03F6	1 byte	Primary IDE
03F8 - 03FF	8 bytes	SERIAL A
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
4000 - 400F	16 byte	Reserved (RAS)

Interrupt Level List

Table 6.2. 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 B (SERIAL B)	0BH
IRQ4	"	|	Serial port A (SERIAL A)	0CH
IRQ5	"	|	Touch panel (SERIAL C)	0DH
IRQ6	"	↓	Not in use (Available for users)	0EH
IRQ7	"	Low	Not in use (Available for users)	0FH

POST Codes

Table 6.3. 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	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. 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

Table 6.3. POST Codes *< 2 / 5 >*

POST (hex)	Description
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
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

Table 6.3. POST Codes ***< 3 / 5 >***

POST (hex)	Description
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
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	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. 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	1. Display PnP logo 2. 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	1. Initialize Init_Onboard_Super_IO switch. 2. 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

Table 6.3. POST Codes ***< 4 / 5 >***

POST (hex)	Description
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
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 SERIAL 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

Table 6.3. POST Codes ***< 5 / 5 >***

POST (hex)	Description
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.
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	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

SERIAL I/O Address and Register Function

The following table lists the I/O addresses in case of SERIAL A.

Table 6.4. I/O Address

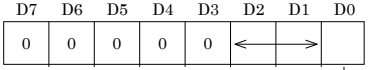
I/O address	DLAB	Read/Write	Register	
03F8H	0	W	Transmitter holding register	THR
		R	Receive buffer register	RBR
	1	W	Divisor latch register (LSB)	DLL
03F9H	1	W	Divisor latch register (MSB)	DLM
	0	W	Interrupt enable register	IER
03FAH	X	R	Interrupt ID register	IIR
03FBH	X	W	Line control register	LCR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

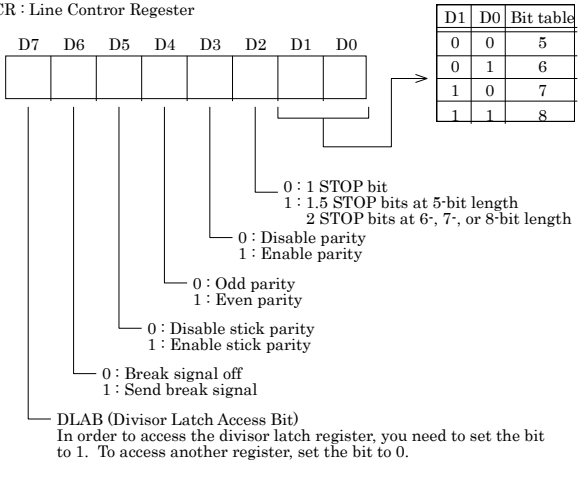
DLAB (Divisor Latch Access Bit) : The value in bit 7 of the line control register.

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 6.5. 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 6.5. Function of Each Register ***< 3 / 4 >***

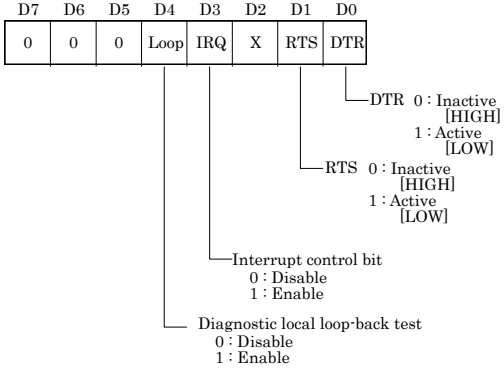
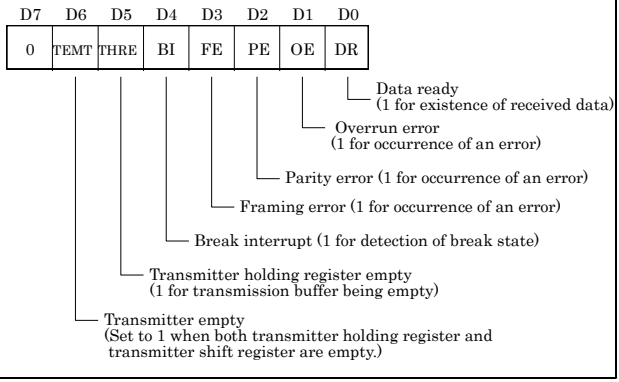
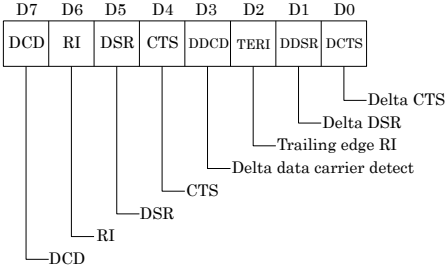
<table>
<tr><th>I/O address</th><th>Description</th></tr>
<tr><td>03FCH</td><td>MCR: Modem Control Register
 
</td></tr>
<tr><td>03FDH</td><td>LSR: Line Status Regester
 
</td></tr>
</table>

Table 6.5. 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 SERIAL A, B. 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 6.6. Baud Rate Settings

Baud rate to be set	SERIAL A, B 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.

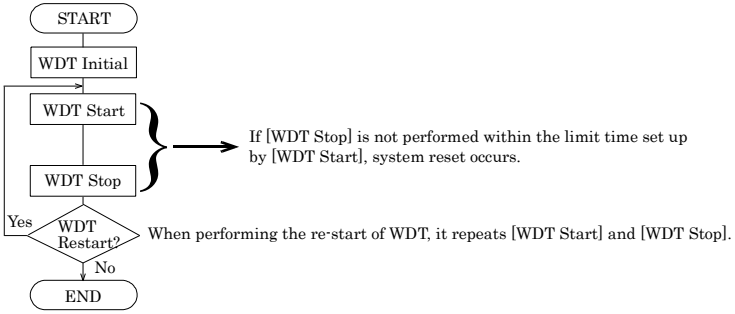
The application software created by user with the watchdog timer enabled, a RESET automatically generated unless the software periodically triggers the timer within the setting time-out interval. That is, while the system gets hung up, the running program can't trigger the timer periodically. The timer will generate a reset signal to reboot the system. 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 255-level time-out interval, 1 - 255 seconds per interval, which can be adjusted by software setting. There is a tolerance of 2 second for this time-out interval. For example, if the time-out interval has been set to 32 seconds, your program should trigger the watchdog timer before 28 seconds are escaped. Otherwise, after 28 - 32 seconds are escaped, the system will automatically reboot. To keep the system running normally, your program should trigger the watchdog timer every 28 seconds.

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.

```
;===============
;<WDT Initial>
;===============
;-----------------------------------------
;Enter the extended function mode
;-----------------------------------------
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
;-------------------------------------
;Set WDT function at pin89
;-------------------------------------
MOV DX,2EH
MOV AL,2BH
OUT DX,AL
MOV DX,2FH
MOV AL,0DH
OUT DX,AL
;-------------------------------------------------
;Select logical device WDT(number 8)
;-------------------------------------------------
MOV DX,2EH
MOV AL,07H
OUT DX,AL
MOV DX,2FH
MOV AL,08H
OUT DX,AL
;-------------------------------------------------
;Activate logical device WDT(number 8)
;-------------------------------------------------
MOV DX,2EH
MOV AL,30H
OUT DX,AL
MOV DX,2FH
MOV AL,01H
OUT DX,AL
;-------------------------------------
;Set timer unit : second
;-------------------------------------
MOV DX,2EH
MOV AL,F5H
OUT DX,AL
MOV DX,2FH
MOV AL,00H
OUT DX,AL
;-----------------------------------------
;Exit the extended function mode
```

```
;-----------------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL

;================================
;<WDT START : counter set and a start >
;================================
;-----------------------------------------
;Enter the extended function mode
;-----------------------------------------
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
;-----------------------------------------------
;Select logical device WDT(number 8)
;-----------------------------------------------
MOV DX,2EH
MOV AL,07H
OUT DX,AL
MOV DX,2FH
MOV AL,08H
OUT DX,AL
;-------------------------------------------------------
;Set time of WDT and start to count down
;-------------------------------------------------------
MOV DX,2EH
MOV AL,F6H
OUT DX,AL
MOV DX,2FH
;-------------------------------------------------------------------------------
;The data of an example is 15 seconds.(01H=1sec.- FFH=255sec.)
MOV AL,0FH      ; 0FH = 15Sec.
;-------------------------------------------------------------------------------
OUT DX,AL
;-----------------------------------
;Exit the extended function mode
;-----------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL

;==============
;<WDT STOP>
;==============
;-----------------------------------
;Enter the extended function mode
;-----------------------------------
MOV DX,2EH
MOV AL,87H
```

```
OUT DX,AL
OUT DX,AL
;-------------------------------------
;Select logical device WDT(number 8)
;-------------------------------------
MOV DX,2EH
MOV AL,07H
OUT DX,AL
MOV DX,2FH
MOV AL,08H
OUT DX,AL
;-------------------------------------
;Stop count down of WDT
;-------------------------------------
MOV DX,2EH
MOV AL,F6H
OUT DX,AL
MOV DX,2FH
;-------------------------------------
;The data of 00H is stop WDT
MOV AL,00H
;-------------------------------------
OUT DX,AL
;-------------------------------------
;Exit the extended function mode
;-------------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL
```

⚠ CAUTION

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

Life of CF

About write endurance

CF contained in PT-955LXC-DC5311 has a write endurance which limits the number of times each memory may be written, due to the characteristic of the memory that is used. Write endurance can be calculated by the following formula as a reference value:

Write endurance (cycles) =
Total capacity (MB) x 100,000 (cycles) / Size of file (MB)

Example1: When the file of 1MB is made for the standard CF (2GB) for PT-955LXC-DC5311, and it rewrites it once a second.

Write endurance = 1920MB x 100,000 cycles / 1MB = 192,000,000 (cycles)
Longevity = 192,000,000 / (3600 x 24 x 365) ≅ 6 (year)

After all these are reference values, confirm its life span by the following S.M.A.R.T.

About S.M.A.R.T.

A self-diagnosis program "SMART" that can obtain the S.M.A.R.T information in a CF is available for download at TDK website. Following information can be obtained using this program:

1. Number of flash memory chips mounted inside CF, and the total number of blocks
2. Total number of write cycles on CF
3. Number of write cycles of the block where rewriting occurs most frequently
4. Number of write cycles of the block where rewriting occurs least frequently
5. Number of write cycles of all the blocks (10 step histogram)

The NAND type flash memory's life span is 100,000 cycles. The number of write cycles for each block can be determined, making it possible to predict life span.

TDK website:

http://www.tdk.co.jp

At the SMART program download destination:
http://www.tdk.co.jp/memorycontroller/mem01000.htm

Requirement for SMART program:

Windows 2000/XP with VB6.0 runtime and MSFLXGRD.OCX component (such as vb6rt330.exe)

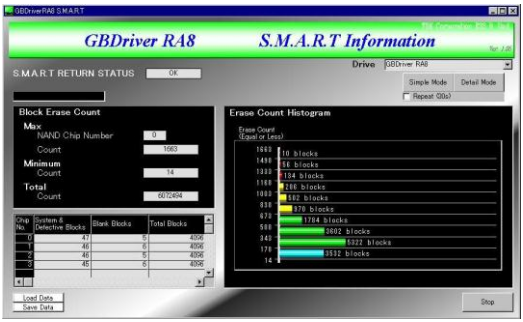


Figure 6.2 S.M.A.R.T.

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.

(1) Remove the rear screws on the back and remove the back cover.

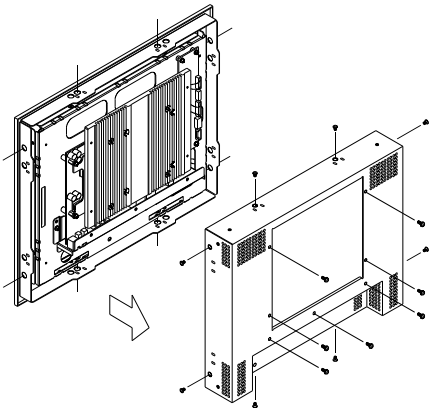


Figure 6.3. Removing the battery 1

(2) Remove the screws fixing the heatsink and remove the heatsink.

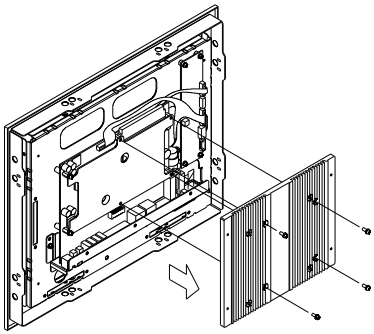


Figure 6.3. Removing the battery 2

(3) Remove the screws fixing the battery and remove the battery.

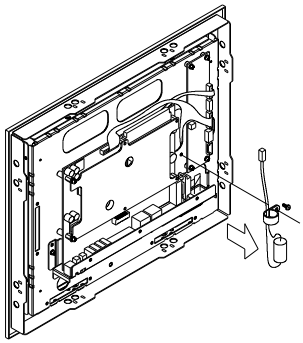


Figure 6.3. Removing the battery 3

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)

⚠ CAUTION

When you use this AC adapter with PT955, the current consumption of USB +5VDC should be 1.0A or less for four ports in total.

Screen protective sheets

- IPC-CV12 12.1-inch screen protective sheets (10 sheets)

⚠ CAUTION

Note that the sheets may not protect the screen because it is a few millimeters smaller than the screen size.

Protective sheets		PT-955 Series	
Model	Sheet size (mm)	Model	Screen size (mm)
IPC-CV12	250.0 × 188.0	PT-955LXC-DC5311	249.0×188.5

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

Additional TFT color LCD

< LVDS&DVI input type >

- 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>

- 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

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

⚠ 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.

Precautions when Using Additional Display

- An additional display can be used to enable simultaneous screen display with the PANEL-PC main display.
- If the resolution of the additional display is different from that of the PANEL-PC main display, the size of screen images on the additional display will be decreased or increased with lower image quality.
- When using the main unit and touch panel function at the same time, use a USB connection for the touch panel.

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

PT-955 Series

User's Manual

PT-955LXC-DC5311

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