IPC Series

PANEL-PC S1000 Series
Core i7, DC input
15", XGA, PCI x 2 / 17", SXGA, PCI x 2

User's Manual

CONTEC CO.,LTD.

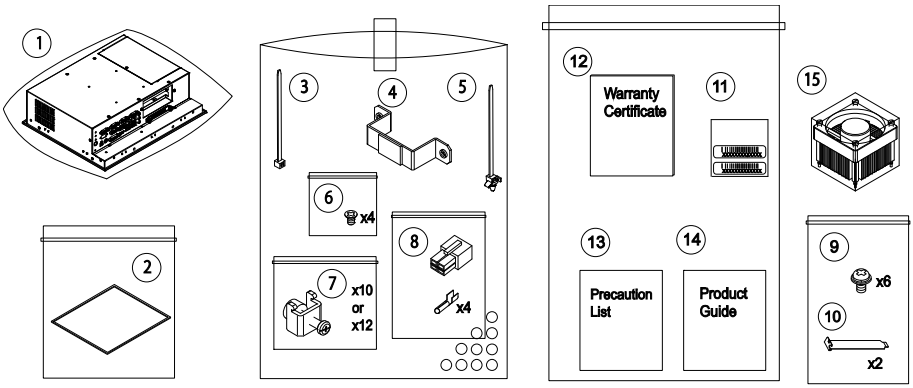
Check Your Package

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 driver & utility software set, download it form the CONTEC's Web site.

Product Configuration List

	Model Name	Panel Size	Memory	CPU	Storage	OS	Slot
A	PT-S1000HXP2-DC7000	15"	4GB	Option	Option	Option	PCI x 2
B	PT-S1000XSXP2-DC7000	17"	4GB	Option	Option	Option	PCI x 2

Configuration Name		A Pcs.	B Pcs.	Configuration Name	A Pcs.	B Pcs.
1. Panel-PC		1		9. Screws to fix slot cover	6	
2. Waterproof packing		1		10. Slot cover	2	
3. Cable Tie 1		1		11. Serial Number Label	1	
4. Low-profile PCI card spacer		1		12. Warranty Certificate	1	
5. Cable Tie 2		1		13. IPC Precaution List	1	
6. Screws to fix HDD		4		14. Product Guide	1	
7. Mounting bracket		10	12	15. CPU Fan	installed	
8. Power supply connector set						
	Housing	1				
	Contact	4				



If you need product manual, driver & utility software set, download it form the CONTEC's Web site.

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Table of Contents

1. Introduction

About the Product

This product is available in the following 2 models:

- 15” LCD panel mount type with 2-PCI slots supporting 3rd Generation Intel ® Core™ Processors
  PT-S1000HXP2-DC7000 (15-inch touch panel, LCD (XGA), Memory 4GB, 2 PCI slots,
  Option: CPU / OS / 2.5-inch HDD / Power supply)
- 17” LCD panel mount type with 2-PCI slots supporting 3rd Generation Intel ® Core™ Processors
  PT-S1000XSXP2-DC7000 (17-inch touch panel, LCD (SXGA), Memory 4GB, 2 PCI slots,
  Option: CPU / OS / 2.5-inch HDD / Power supply)

Features

- Based on Ivy Bridge branded as 3rd Generation Intel® Core™ Processors

The platform with higher performance provides further experience against heavy CPU loading for various industrial scenes.

- CONTEC’s reliable design

Industrial design contributes to various uses under severe conditions, such as high temperature (50°C), low temperature (0°C), vibration (1.5G) and shock (10G).

- Remote power management function to reduce operation tasks

This product supports remote wake-up by LAN or Serial. It provides your system with high usability under your own network.

- Rich interfaces

USB3.0 x 4
USB2.0 x 2
1000BASE-T x 2
Serial x 4
DVI-D, VGA, HDMI
Audio
2.5-inch SATA drive bay
PCI x 2

- A wide range of power supplies

It can be used in a variety of power environments, 10.8 - 31.2VDC.

- Touch panel enables keyboard-less operation.

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

Supported OS

- Windows 7 Professional

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.

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

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 storage.
- Always disconnect the power cable from the receptacle 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.

- 2.5-inch HDD slot does not support hot plugging. 2.5-inch HDD cannot be removed or inserted while the power is on. Do not remove or install 2.5-inch HDD or connect to 2.5-inch HDDs while the unit is turned on. 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°C with the power disconnected is 7 years or more.
  (2) Touch panel--- The operating lifetime of the touch panel is at least 36 millions touches (as tested by mechanical touching under 250g of force at a rate of two presses per second).
  (3) 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).
  (4) CPU Fan--- 50,000h (40°C)
  (5) System Fan--- 110,000h (40°C)
  * 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

Model		PT-S1000HXP2-DC7000	PT-S1000XSXP2-DC7000
Assembly type		Panel mounted	
CPU		[Recommended] Core i7-3610QE 3.30GHz [Available] Core i5-3610ME 2.70GHz Core i3-3120ME 2.40GHz Celeron 1020E 2.20GHz	
Chipset		Intel® QM77	
BIOS		BIOS (mfd. by AMI)	
Memory		4GB (204pin SO-DIMM x 2), DDR3-1333/1600, Option: +4GB	
Graphic	Controller	Intel® HD4000 (Built in Intel® Core™ Processor)	
	Video RAM	Main memory shared	
	Video BIOS	64KB(C0000H-CFFFFH)	
LCD type	LCD type	15-inch, XGA(1024 x 768)	17-inch, SXGA(1280 x 1024)
		TFT color LCD, 16,770,000 colors	
	Backlight	LED method, The ON/OFF software can control.	
Touch panel	Resolution	2048 x 2048	
		Emulated in 1024 x 768 mode	Emulated in 1280 x 1024 mode
	Detection method	Resistive-film analog type	
	Connection	Internal USB port	

Table 2.2. Interface

Model		PT-S1000HXP2-DC7000 PT-S1000XSXP2-DC7000
External display output (only one choice)	DVI-D	1 port (29-pin DVI-I connector), 1,920 x 1,200 (Max.) 16,770,000 colors for DVI-D only
	HDMI	1 port (19-pin HDMI Type A connector) 1,920 x 1,200 (Max.) 16,770,000 colors for HDMI1.4b
	VGA	1 port (15-pin VGA connector) 2,048 x 1,536 (Max.) for VGA
Audio		LINE-OUT x 1 / 3.5-phi mini jack LINE-IN x 1 / 3.5-phi mini jack MIC-IN x 1 / 3.5-phi mini jack HD Audio compliant
Serial ATA		2.5-inch SATA HDD Drive Bay x 1 (Option: +1 Drive Bay) Corresponding to serial ATA 3.0 standard port
LAN	I/F	RJ-45 x 2 @ 1000BASE-T/100BASE-TX/10BASE-T (Wake On LAN support)
	Controller	Intel ® 82579LM (LAN1), Intel ® 82583V (LAN2)
USB		USB 3.0 x 4 / USB 2.0 x 2
Serial		9-pin DSUB (male) x 3 @ RS-232C (general-purpose) / SERIAL PORT1,2,3 9-pin DSUB (male) x 1 @ RS-232C/422/485 (general-purpose) / SERIAL PORT4 Baud rate: 50 - 115,200bps
PS/2 Keyboard & Mouse		Yes
General-purpose I/O		Option
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		QM77 integrated, The real-time clock is accurate within ±3 minutes (@ 25°C) per month Litihum backup battery life: 7 years or more
Expansion board slot		PCI slot x 2 Usable board dimension : 185 mm (Max.)
Power Management		Power management setup via BIOS, Power On by Ring / Wake On LAN, Supports ACPI Power management
Power supply	Power supply connector	12 - 24VDC Use a DC power cable shorter than 3m.
	Current consumption	12VDC: 16.1A (Max.) 24VDC: 7.9A (Max.)
	Expansion board power supply capacity	+12V: 1A, +5V: 2A, +3.3V: 1A, -12V: 0.5A, -5V: Not supplied
	External device power supply capacity	USB2.0 +5V : 1.0A (500mA x 2) USB3.0 +5V : 3.6A (900mA x 4)

Table 2.3. Installation Environment Requirements

Model		PT-S1000HXP2-DC7000 PT-S1000XSXP2-DC7000
Operating temperature		0 - 50°C (0 - 45°C when using 1000BASE-T) Please refer to chapter 3, "Installation Requirements" for required conditions.
Storage temperature		-10 - 60°C
Operating humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gas		None
Water / Dust proof		IP65 (front panel only)
Noise resistance	Line noise	AC line / ±2kV, using power supply LDA100W-24 (COSEL) 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	When HDD is turned on: 10 - 50Hz/0.5G 25 min. each in x, y, and z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
		When HDD is turned off : 10 - 57Hz/semi-amplitude 0.15 mm 57 - 150Hz/1.5G 40 min. each in x, y, and z directions (JIS C 60028-2-6-compliant, IEC 60068-2-6-compliant)
Impact resistance		10G, half-sine shock for 11 ms in x, y, and z directions (JIS C60068-2-27-compliant, IEC68-2-27-compliant)
Grounding		Class D grounding, SG-FG / continuity

Table 2.4. Display Optical Specifications

Parameter	Condition			PT-S1000HXP2-DC7000		PT-S1000XSXP2-DC7000	
				Min.	Typ.	Min	Typ
Visual angle (vertical)	CR=10	ϕ = 180°	Display. Monochrome	140deg	150deg	140deg	150deg
		ϕ = 0°		20deg	10deg	20deg	10deg
Visual angle (horizontal)		ϕ = +90°		70deg	80deg	70deg	80deg
		ϕ= -90°		70deg	80deg	70deg	80deg
Surface brightness (at center)	Display in white			320cd/m²	400cd/m²	280 cd/m²	350 cd/m²

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

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

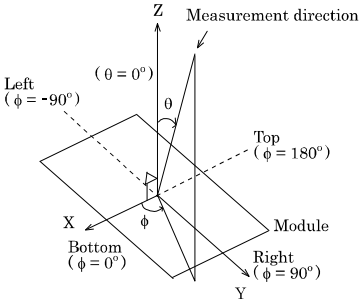


Figure 2.1. Definition of viewable range

⚠ 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 2.5. DC voltage tolerance

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

Physical Dimensions

PT-S1000HXP2-DC7000

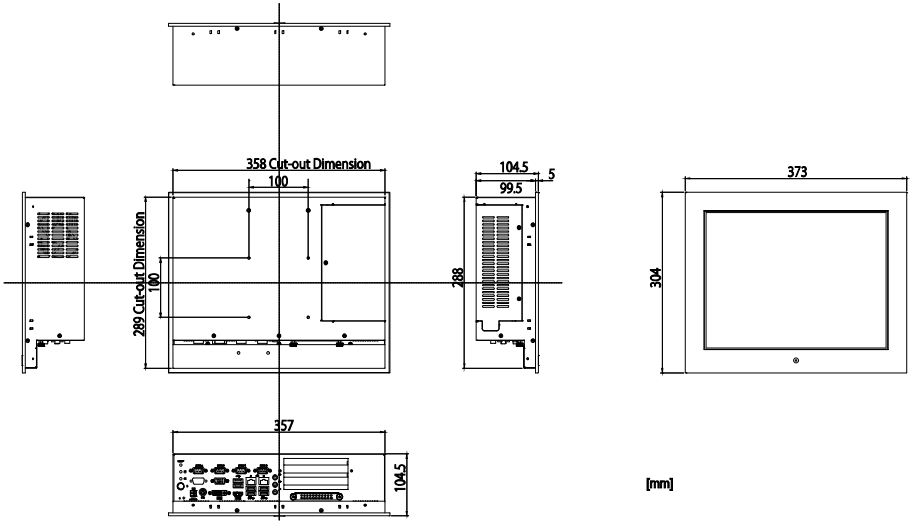


Figure 2.2. Physical Dimensions (PT-S1000HXP2-DC7000)

PT-S1000XSXP2-DC7000

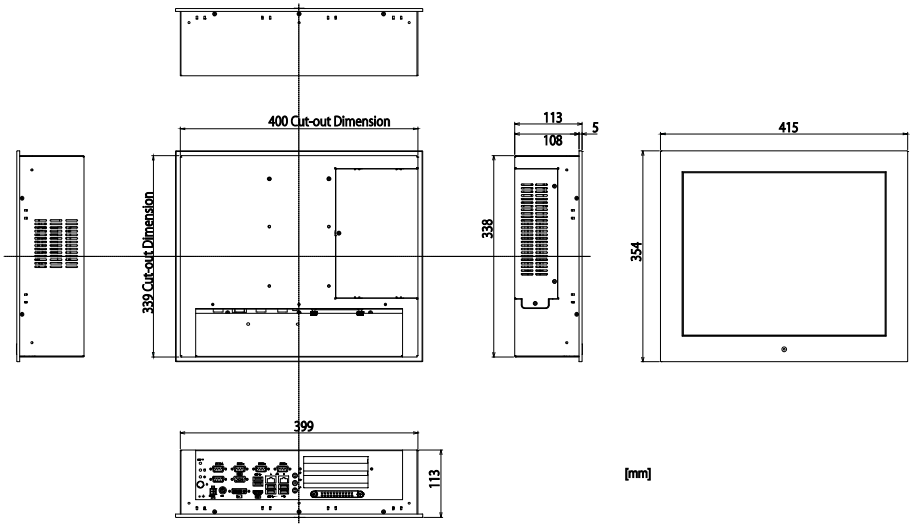


Figure 2.3. Physical Dimensions (PT-S1000XSXP2-DC7000)

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.

*1 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 HDD

(1) Remove the hard disk bracket from the main body.

(2) Attach the hard disk to the hard disk bracket and secure it by tightening the four screws.

(3) Insert the hard disk bracket with the hard disk attached into the main body, and secure it by tightening the screws.

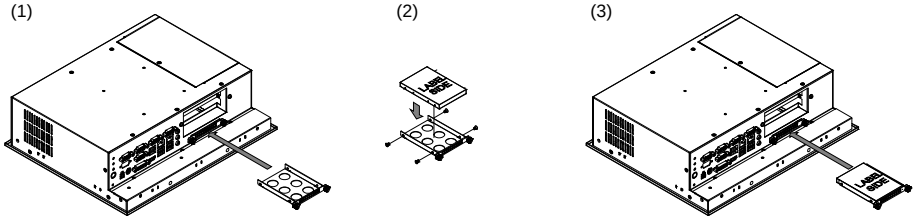


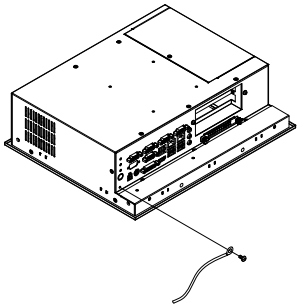
Figure 3.1. Attaching the HDD

⚠ CAUTION

- Insert the Hard disk 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 cable ties for fixing cables.

Fastening the PS2, Audio Cable

Use the cable ties appropriately to fasten cables and fix it by using the hole on a chassis.

Fastening the USB, HDMI Cable

Use the cable ties appropriately to fasten cables.

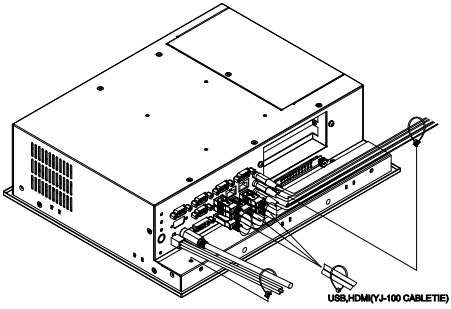
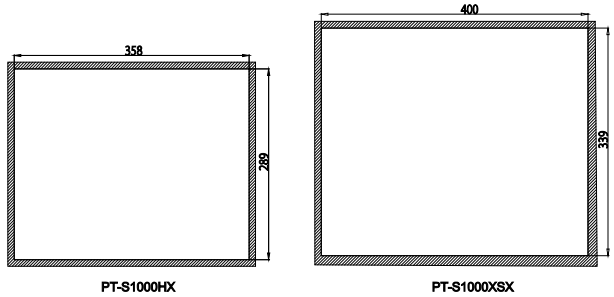


Figure 3.3. Attaching the cable ties

Hardware Setup

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



* Panel thickness range 1.6 - 7mm [mm]

Figure 3.4. Dimensions of Panel Opening

(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.

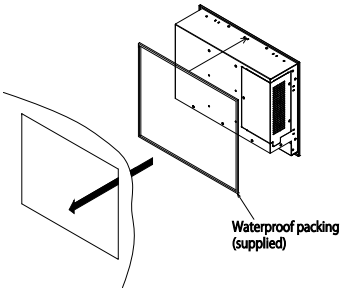


Figure 3.5. Attaching the waterproof packing

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

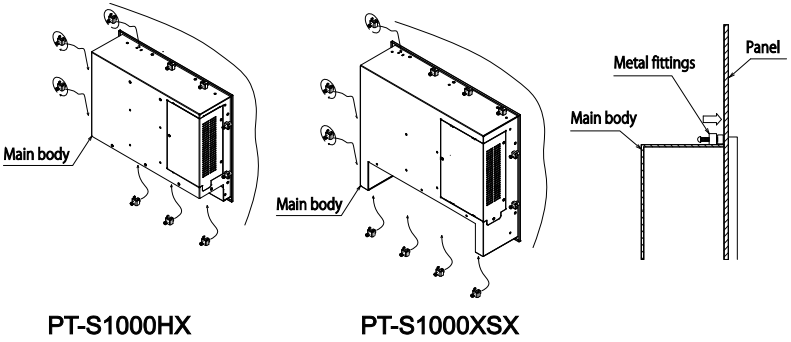


Figure 3.6. Hardware Setup

⚠ CAUTION

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

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.

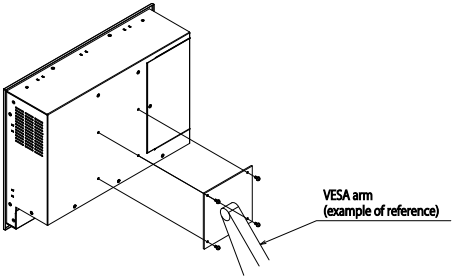


Figure 3.7. Installation of VESA metal fittings

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.

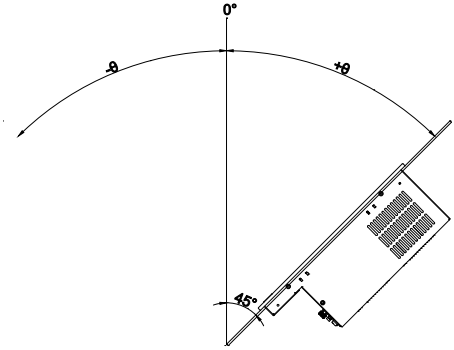


Figure 3.8. Installed angle which is recommended

⚠ CAUTION

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

Distances between this product and its vicinity

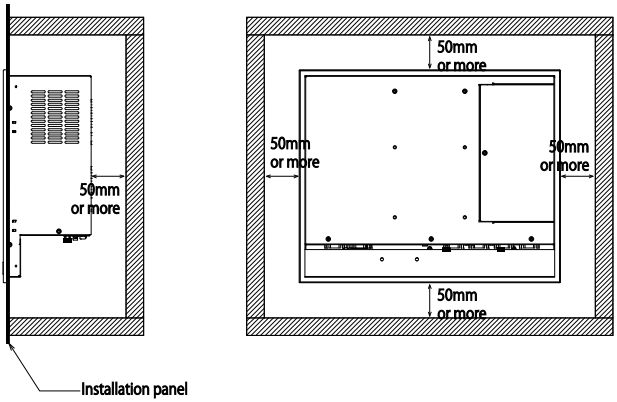


Figure 3.9. Distances between this product and its vicinity

⚠ 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.

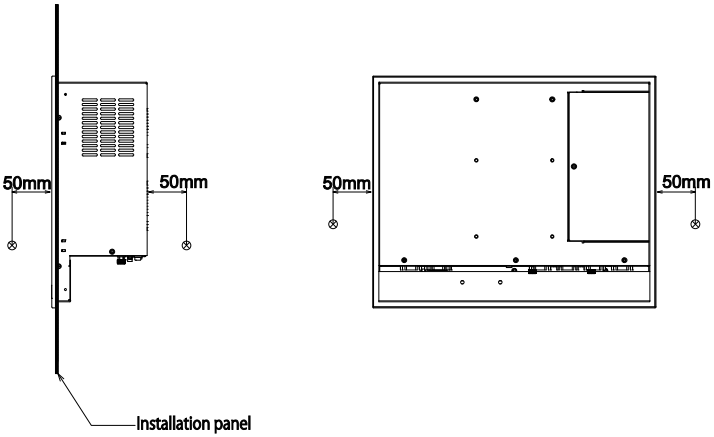


Figure 3.10. Measurement points of ambient temperature

PCI Card Installation

(1) Be sure the power is turned off.

(2) Remove the top cover.

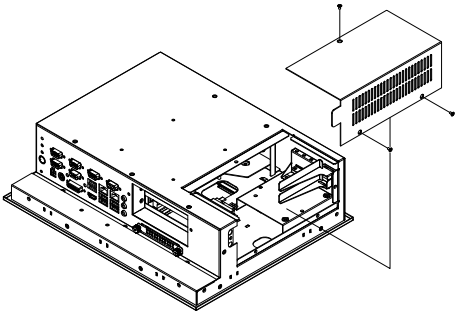


Figure 3.11. Remove the top cover

(3) Remove the brace base with PCI card brace.

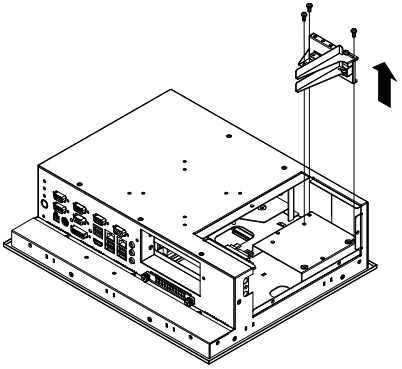


Figure 3.12. Remove the brace base with PCI card brace

(4) Let brace base and PCI card brace separate and install brace base by using 3 screws.

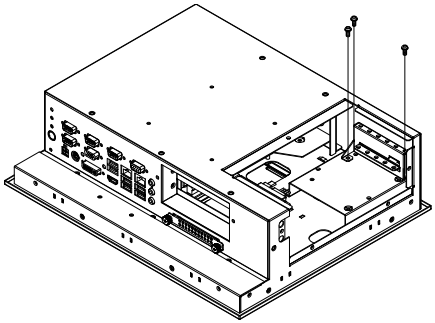


Figure 3.13. Hold brace base

(5) Insert PCI card into the slot and fasten it with screws.

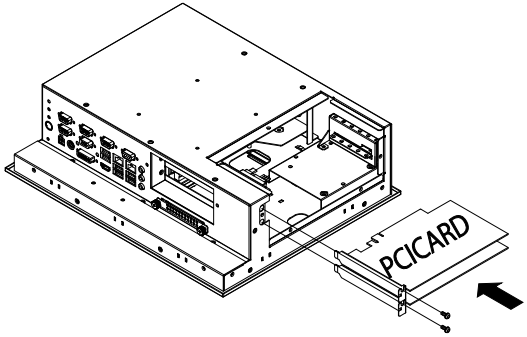


Figure 3.14. Insert PCI card

(6) Make sure carefully that PCI card has been secured in the slot. Fix PCI card stably by brace and screw.

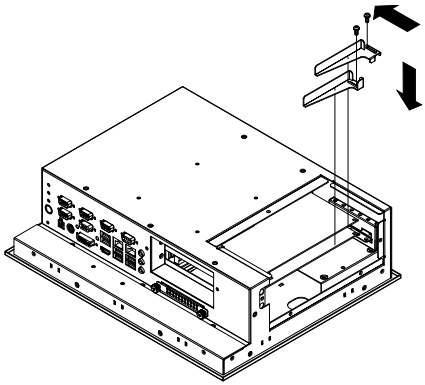


Figure 3.15. Fix PCI card

(7) Replace the cover.

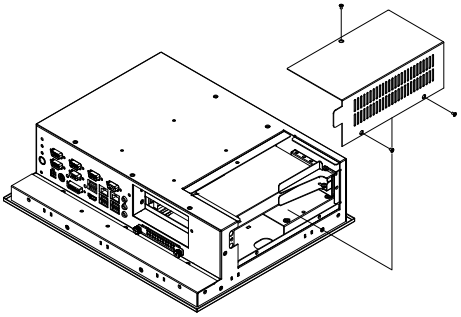


Figure 3.16. Replace the cover.

The location of brace base

Brace base can be installed to 2 locations. Select one according to the size of your PCI card.

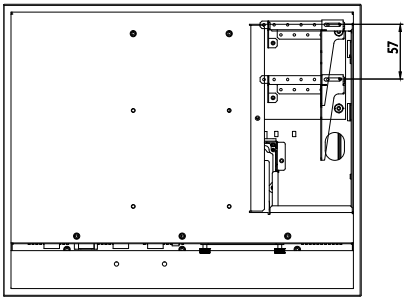


Figure 3.17. The locaction of brace base

The Installation of low-profile PCI card

Use attached spacer for installing low-profile PCI card.

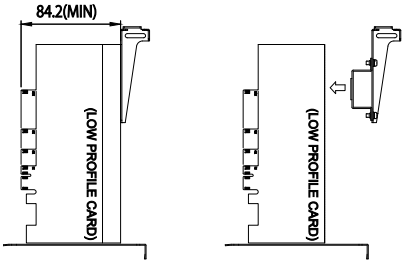


Figure 3.18. The installation of low-profile PCI card

Replace Fan

(1) Be sure the power is turned off.

(2) Remove the top cover.

(3) Replace Fan.

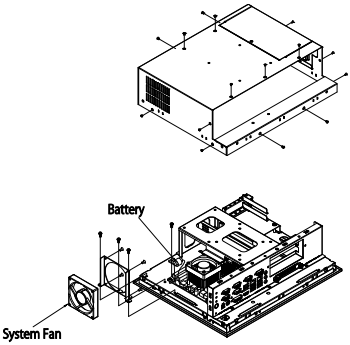


Figure 3.19. Replace Fan

Replace Fan Filter

(1) Be sure the power is turned off.

(2) Remove the top cover.

(3) Replace Fan filter.

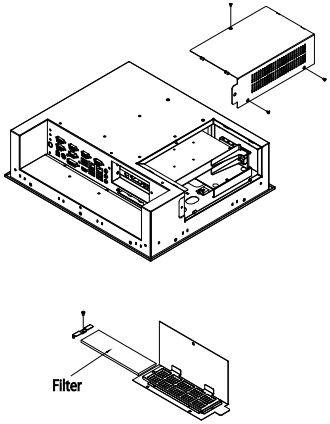
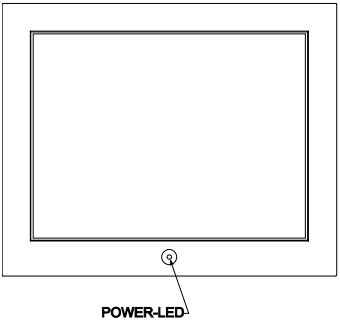


Figure 3.20. Replace Fan Filter

4. Each Component Function

Component Name

- Front view



- Bottom view

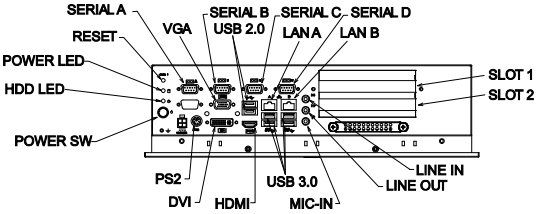


Figure 4.1. Component Name

Table 4.1. Component Function

Name	Function
POWER SW	Power switch
RESET SW	Reset switch
POWER LED	Power ON LED
HDD LED	HDD access LED
DC-IN	DC power input connector
LINE OUT	Line out (ϕ3.5 PHONE JACK)
LINE IN	Line in (ϕ3.5 PHONE JACK)
MIC IN	Mic in (ϕ3.5 PHONE JACK)
USB 3.0	USB 3.0 port connector x 4
USB 2.0	USB 2.0 port connector x 2
PS2	PS2 Keyboard / Mouse connector (6pin female)
LAN A, B	Ethernet 1000BASE-T/100BASE-TX/10BASE-T RJ-45 connector x 2
SERIAL A, B, C	RS232C connector (9pin D-SUB/male) x 3
SERIAL D	RS232C / 422 / 485 connector (9pin D-SUB/male) x 1
Slot 1, 2	PCI card slot 1, 2
DVI	Digital Display (29pin female)
VGA	Analog Display (15pin female)
HDMI	HDMI Type A connector (19pin male)
HDD	2.5" SATA HDD slot

Component Function

LED: POWER, HDD

There are 2 LEDs in front of this product.

Table 4.2. Display Contents of LED

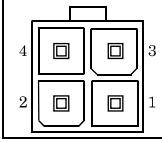
LED name	State	Display contents
POWER LED	OFF	Indicates that this product is switched off.
	ON (Green)	Indicates that this product is switched on.
HDD LED	ON (Orange)	Indicates that the HDD device is being accessed.

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 16.1A or more, 24V 7.9A 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

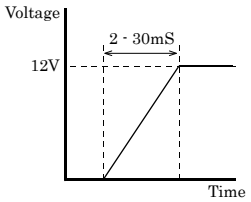


Figure 4.2. Graph of Rise Time of Power Supply

Power switch: POWER SW

POWER SW is provided.

Reset switch: RESET SW

RESET 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.

Line in Interface: LINE IN

A line input connector is provided. You can plug an audio output device into this connector.

Mic in Interface: MIC

A MIC input connector is provided. You can plug a microphone into this connector.

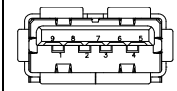
Audio driver

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.

USB 3.0 Ports: USB 3.0

This product is equipped with 4 ports for USB 3.0 interface.

Table 4.4. USB 3.0 Connector

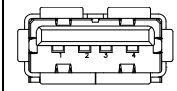


Pin No.	Function	Pin No.	Function
1	USB_VCC	5	RX-
2	USB-	6	RX+
3	USB+	7	GND
4	USB_GND	8	TX-
		9	TX+

USB 2.0 Ports: USB 2.0

This product is equipped with 2 ports for USB 2.0 interface.

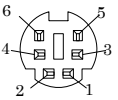
Table 4.5. USB 2.0 Connector



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

PS/2 Keyboard / Mouse
This product is equipped with 1 MINI DIN connector for PS/2 keyboard / mouse.

Table 4.6. PS/2 Connector



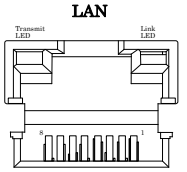
Pin No.	Function
1	KB Data
2	MS Data
3	GND
4	+5VSB
5	KB Clk
6	MS Clk

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 : 82579LM (LAN-A) / 82583V (LAN-B)

Table 4.7. 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

⚠ CAUTION

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

Serial Port Interface: SERIAL A - D

SERIAL A,B,C,D

The product has 4 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.

Serial D additionaly support RS422 / 485. Please change jumper settings according to next section when you use RS422 / 485.

Table 4.8. SERIAL A, B, C, D I/O Addresses and Interrupts

SERIAL	I/O address	Interrupt
A	260h - 267h	IRQ 11
B	268h - 26Fh	IRQ 10
C	2F8h – 2FFh	IRQ 3
D	3F8h – 3FFh	IRQ 4

Table 4.9. Serial Port (A, B, C Connector)

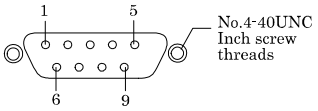
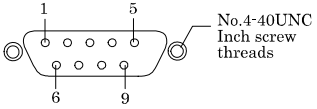
Connector used on the product	9-pin D-SUB (MALE)		
			
Pin No.	Signal name	Meaning	Direction
1	CD	Carrier detect	Input
2	RD	Received data	Input
3	TD	Transmitted data	Output
4	DTR	Data terminal ready	Output
5	GND	Signal ground	-----
6	DSR	Data set ready	Input
7	RTS	Request to send	Output
8	CTS	Clear to send	Input
9	RI	Ring indicator	Input

Table 4.10. Serial Port (D Connector)

Connector used on the product	9-pin D-SUB (MALE)		
			
Pin No.	Signal name	Signal name	Signal name
	RS232C	RS422	RS485
1	CD	TX-	Data-
2	RD	TX+	Data+
3	TD	RX+	N.C.
4	DTR	RX-	N.C.
5	GND	GND	GND
6	DSR	N.C.	N.C.
7	RTS	N.C.	N.C.
8	CTS	N.C.	N.C.
9	RI	N.C.	N.C.

RS-422 / RS-485 specifications

Serial port D

- Transmission method: RS-422-/RS-485-compliant asynchronous serial transmission
- Baud rate: 50 to 115,200bps(programmable)
- Signal extensible distance: 1.2km (Max.)
- Termination : 120ohm

Table 4.11. Serial D jumper settings

	RS232C	RS422	RS485
JP1			
JP2			
JP3			

Expansion slots

It has two expansion slots for the implementation of PCI bus type borad.

Board Dimensions Allowed

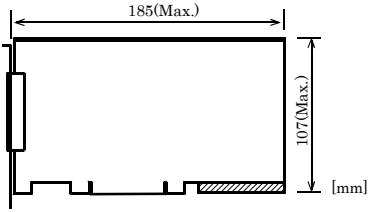


Figure 4.3. Expansion Board Dimensions

⚠ CAUTION

- A board that uses the back of the board edge connector (the shaded area in the figure) may not be mounted.
- The PCI bus slot is for 32 bit. Operational tests are not performed for the dual purpose boards for 64bit / 32bit such as ADAPTEC 39160SCSI board or Intel Pro1000/MT network board.

DVI-D Interface: DVI-D

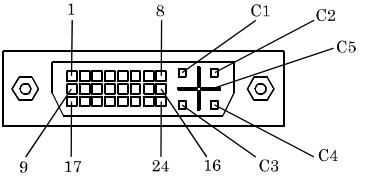
A DVI-D interface is provided. You can use it to connect a digital-type monitor. The connector is named DVI (DVI-I 29-pin connector).

⚠ CAUTION

Analog RGB signal is not provided.

Table 4.12. DVI Connector

Connector used on the product	DVI-I 29 pin



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

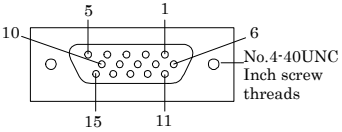
Display driver

Install the appropriate display driver for your OS from the CONTEC's Web site.

Display Interface : VGA

Connector for display connection is provided. Connector name is VGA(HD-SUB 15P).

Table 4.13. Display Connector

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

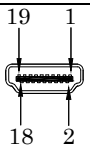
Display driver

Install the appropriate display driver for your OS from the CONTEC's Web site.

HDMI Interface: HDMI

HDMI interface is provided. You can use it to connect a digital-type monitor. The connector is named HDMI (HDMI 19-pin connector).

Table 4.14. HDMI Connector

Connector used on the product	HDMI 19 pin		
			
Pin No.	Signal name	Pin No.	Signal name
1	DATA2+	11	CLK SHIELD
2	DATA2 SHIELD	12	CLK-
3	DATA2-	13	GND
4	DATA1+	14	N.C.
5	DATA1 SHIELD	15	SCL
6	DATA1-	16	SDA
7	DATA0+	17	GND
8	DATA0 SHIELD	18	+5V
9	DATA0-	19	HPD
10	CLK+		

Display driver

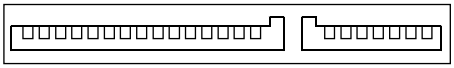
Install the appropriate display driver for your OS from the CONTEC's Web site.

Serial-ATA: S-ATA

It has serial-ATA-3.0-compliant controller.

2.5-inch SATA HDD can be connected to an onboard connector.

Table 4.15. SATA Connector

Connector used on the product	SATA connector		
			
Pin No.	Signal name	Pin No.	Signal name
PC1	N.C.	S1	GND
PC2	N.C.	S2	TX+
PC3	N.C.	S3	TX-
PC4	GND	S4	GND
PC5	GND	S5	RX-
PC6	GND	S6	RX+
PC7	+5V	S7	GND
PC8	+5V		
PC9	+5V		
PC10	GND		
PC11	GND		
PC12	GND		
PC13	+12V		
PC14	+12V		
PC15	+12V		

5. BIOS Setup

Introduction

This chapter discusses American Megatrends Inc.'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 FLASH ROM 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 BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the FLASH ROM 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 are in control, the Setup program can be activated in one of two ways:

1 By pressing <Del> or <F2> immediately after switching the system on, or

2 By pressing the <Del> or <F2> key when the following message appears briefly at the screen during the POST (Power On Self-Test).

```
Press <DEL> or <F2> 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. Restart can be initiated by pressing the <Ctrl>, <Alt>, and <Delete> keys simultaneously.

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
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help on Setup navigation keys
F2 key	Load previous settings
F3 key	Load the optimized defaults
F4 key	Save all settings changes to the FLASH ROM 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> key again.

In Case of Problems

If it is not possible to boot the computer after system settings have been changed and saved during setup, this product will need to be repaired. 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 AMI and your systems manufacturer to provide the absolute maximum performance and reliability. If chipset settings are changed even slightly, it may become necessary to repair the unit.

A Final Note about Setup

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

Main Menu

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

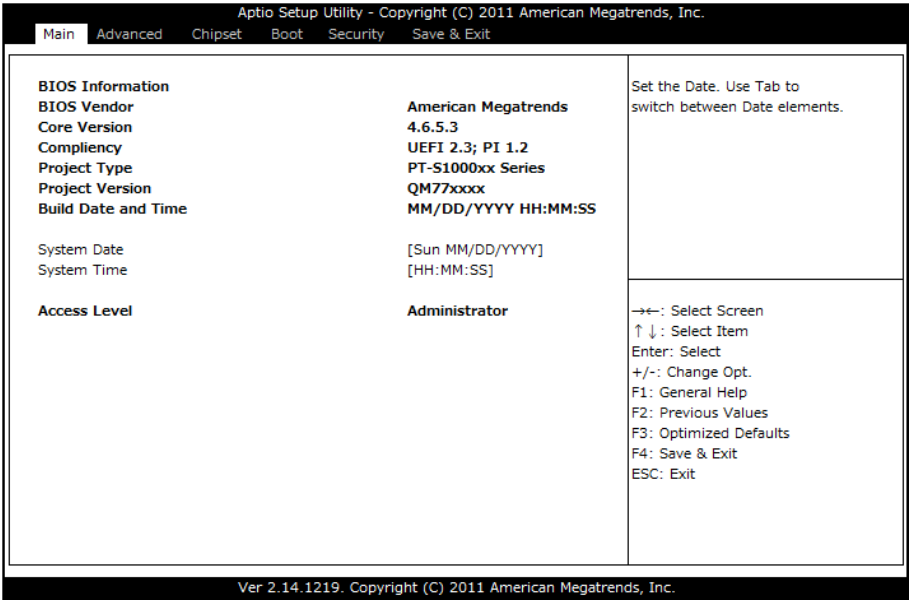


Figure 5.1. Main Manu

Setup Items

The main menu includes the following main setup categories.

- Main
Use this menu to check basic system configuration, and to change system date.

- Advanced
Use this menu to set detailed function available for your system.

- Chipset
Use this menu to specify settings related to the chipset used.

- Boot
Use this menu to specify the boot settings.

- Security
Use this menu to change password to protect the security of your system.

- Save & Exit
Use this menu to load / save the setting, or to exit the setup menu.

Main

Use this menu to check basic system configuration. Settings that can be configured in the Main menu are described in the table below.

Table 5.2. Main Menu (Display only)

Item	General Description	Explanation
System Date	Month / Day / Year	Set the system date. The day of the week is set automatically.
System Time	Hour : Minute : Second	Set the system time.
Access Level	Administrator	Display access permissions for the current setup. Items that can be configured depend on access permissions.

Advanced

You can set the detailed function of system. Following items are available.

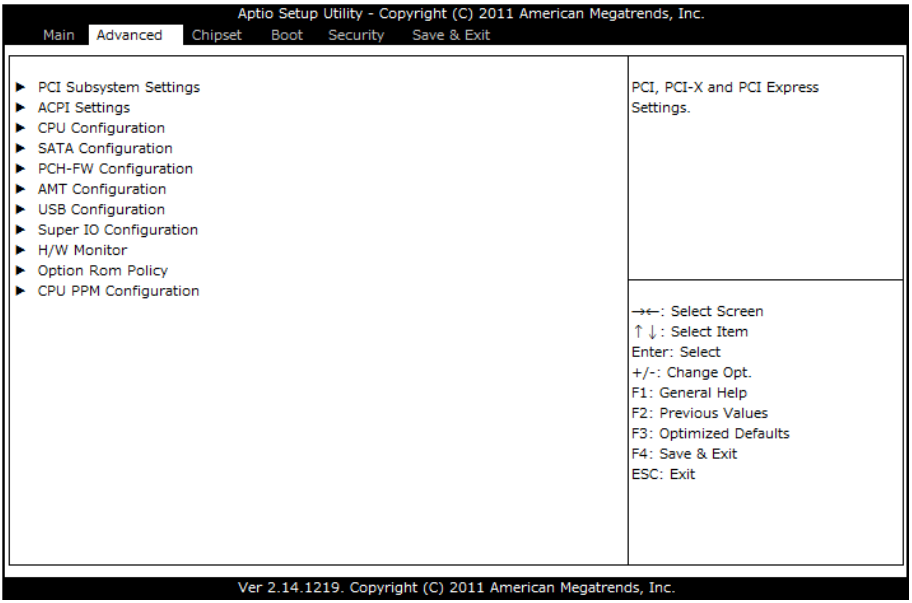


Figure 5.2. Advanced menu

The following sub items are available:

- PCI Subsystem Settings
Use this menu to specify the pci subsystem settings.

- ACPI Settings
Use this menu to specify ACPI power management settings.

- CPU Configuration
Use this menu to specify the cpu configuration.

- SATA Configuration
Use this menu to specify the SATA configuration.

- PCH-FW Configuration
Use this menu to check the PCH Firmware configuration.

- AMT Configuration
Use this menu to specify the Intel ® Active Management Technology configuration.

- USB Configuration
Use this menu to specify the usb configuration.

- Super I/O Configuration
Use this menu to specify the Super I/O configuration.

- H/W Monitor
Use this menu to check hardware monitor.

- Option Rom Policy
Use this menu to specify the Option Rom.

- CPU PPM Configuration
Use this menu to specify the CPU PPM configuration.

PCI Subsystem Settings

Use this menu to specify PCI subsystem settings.

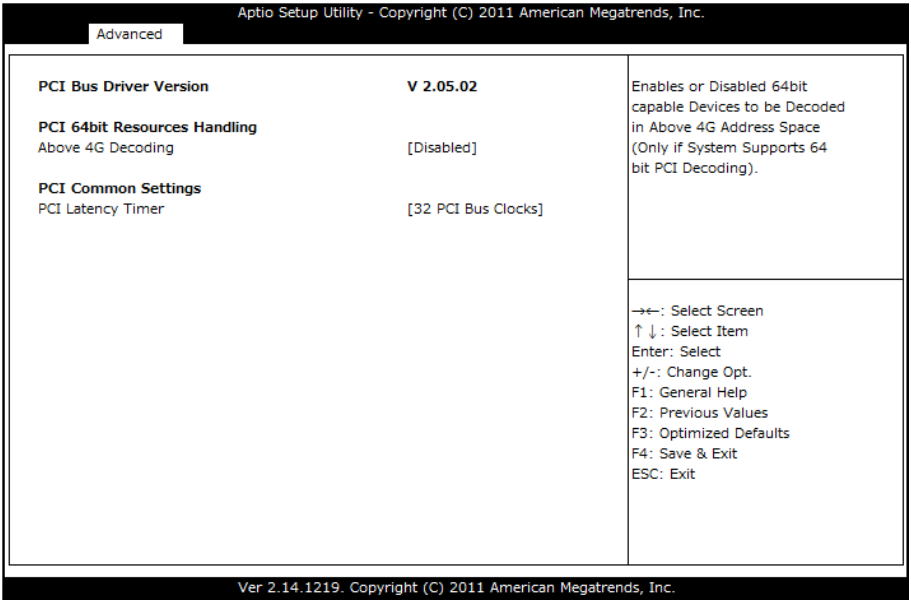


Figure 5.3. PCI Subsystem Settings

Items that can be configured for PCI subsystem settings are described in the table below.

Table 5.3. PCI Subsystem Settings

Item	Option	Explanation
Above 4G Decoding	Disabled Enabled	Enables or Disables 64bit capable devices to be decoded in above 4G Address space. (Only if System supports 64bit PCI decoding)
PCI Latency Timer	32 PCI Bus Clocks 64 PCI Bus Clocks 96 PCI Bus Clocks 128 PCI Bus Clocks 160 PCI Bus Clocks 192 PCI Bus Clocks 224 PCI Bus Clocks 248 PCI Bus Clocks	Value to be programmed into PCI Latency Timer Register.

ACPI Settings

Use this menu to specify ACPI power management settings.

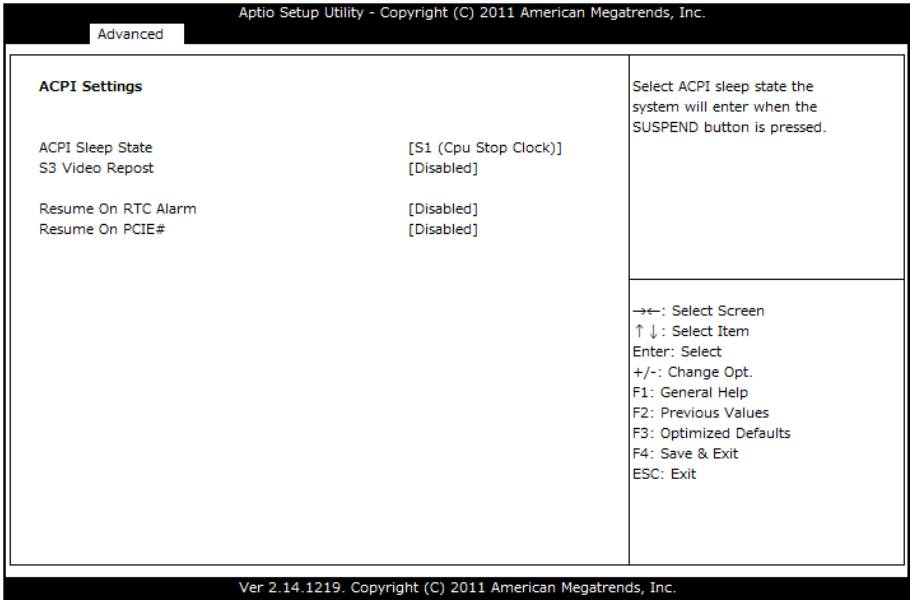


Figure 5.4. ACPI Settings

Items that can be configured for ACPI Settings are described in the table below.

Table 5.4. ACPI Settings

Item	Option	Explanation
ACPI Sleep State	[S1 only(CPU Stop Clock)] S3 only(Suspend to RAM)	Select ACPI sleep state the system will enter when the SUSPEND button is pressed.
S3 Video Repost	[Disabled] Enabled	Enable or Disable S3 Video Repost.
Resume On RTC Alarm	[Disabled] Enabled	Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified.
RTC Wake up Day	0 - 31	Select 0 for daily system wake up. 1-31 for which day of the month that you would like the system to wake up.
RTC Wake up Hour	0 - 23	Select 0 – 23. For example enter 3 for 3am, and 15 for 3pm.
RTC Wake up Minute	0 - 59	Select 0 – 59.
RTC Wake up Second	0 - 59	Select 0 – 59.
Resume On PCIE#	[Enabled] Disabled	Enable or disable system wake on PCI-E devices or Onboard LAN2.

CPU Configuration

Use this menu to specify CPU settings.

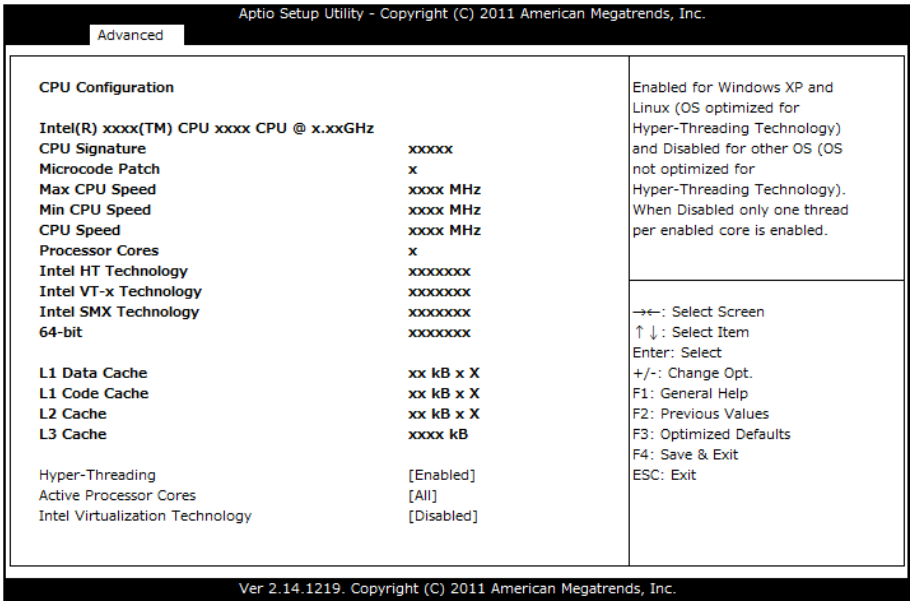


Figure 5.5. CPU Configuration

Items that can be configured for CPU Configuration are described in the table below.

There items are not displayed when using non-supported CPUs.

Table 5.5. CPU Configuraiton

Item	Option	Explanation
Hyper-Threading	Disabled [Enabled]	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).
Active Processor Cores	[All] … 1	Number of cores to enable in eache processor package.
Intel Virtualization Technology	[Disabled] Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

SATA Configuration

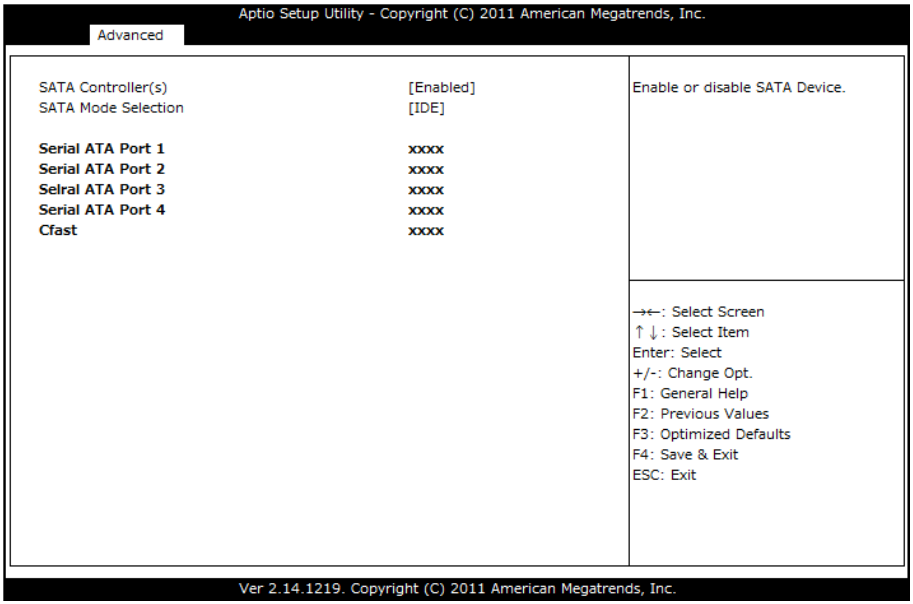


Figure 5.6. SATA Configuration

Items that can be configured for SATA Configuration are described in the table below.

Table 5.6. SATA Configuraiton

Item	Option	Explanation
SATA Controller(s)	Disabled [Enabled]	Enable or disable SATA devices.
SATA Mode Selection	[IDE] AHCI RAID	Determines how SATA controller(s) operate.
SATA Controller Speed	Gen1 Gen2 [Gen3]	Indicates the maximum speed the SATA controller can support. Gen3 is only supported in SATA1 and SATA2. This item can only setting in AHCI or RAID mode.

PCH-FW Configuration

Use this menu to check the PCH Firmware configuration.

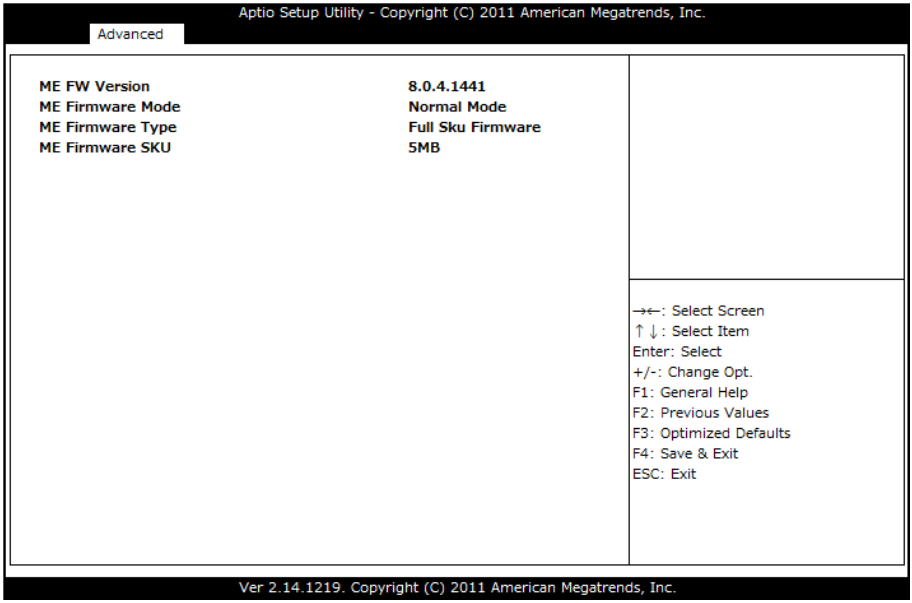


Figure 5.7. PCH-FW Configuration

AMT Configuration

Use this menu to specify the Intel ® Active Management Technology configuration.

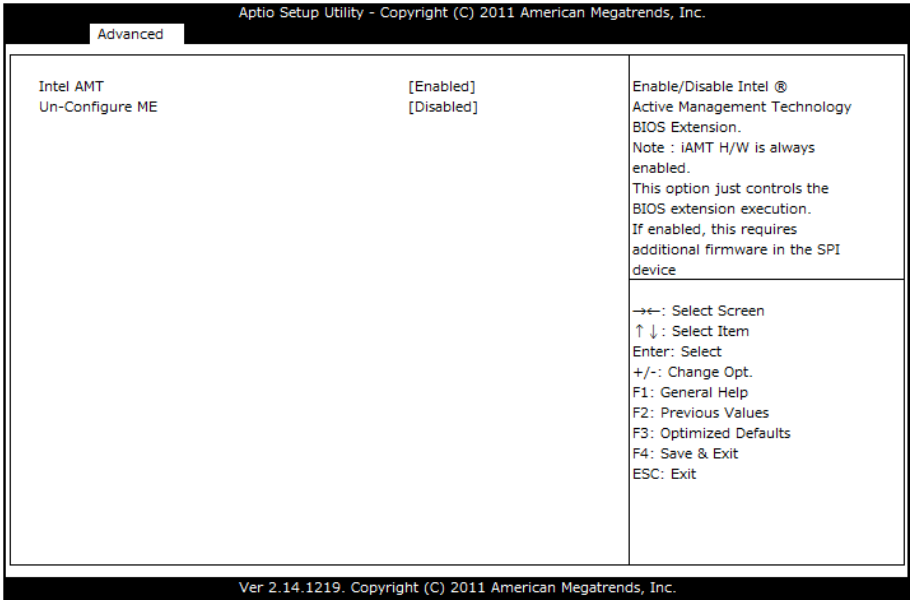


Figure 5.8. AMT Configuration

Items that can be configured for AMT Configuration are described in the table below.

Table 5.7. AMT Configuraiton

Item	Option	Explanation
Intel AMT	Disabled [Enabled]	Enable/Disable Intel ® Active Management Technology BIOS Extension. Note that iAMT H/W is always enabled. This option just controls the BIOS extension execution.
Un-Configure ME	[Disabled] Enabled	Un-Configure ME without password when Enabled.

USB Configuration

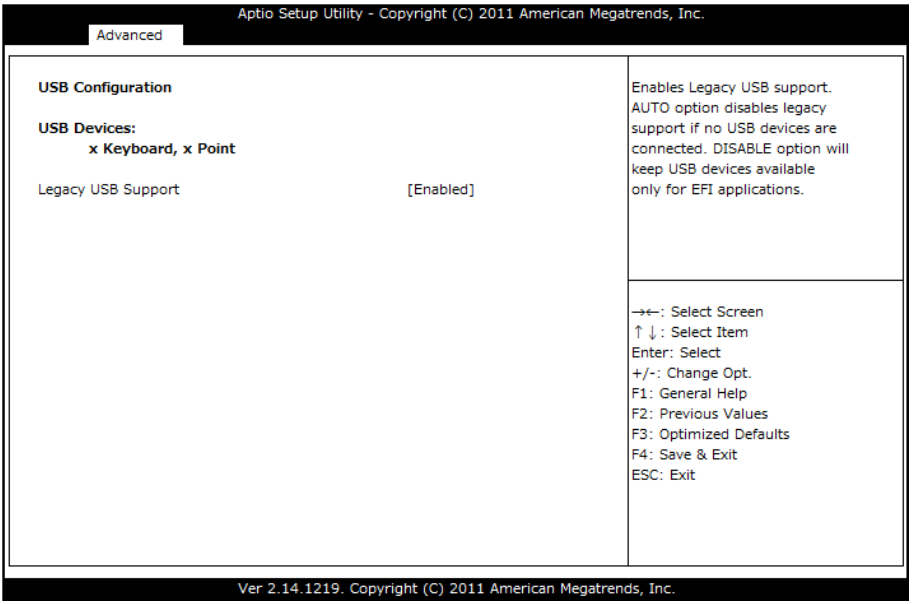


Figure 5.9. USB Configuration

Items that can be configured for USB Configuration are described in the table below.

Table 5.8. USB Configuraiton

Item	Option	Explanation
USB Devices:	-	Show only. Show USB Devices are connected.
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Super I/O Configuration

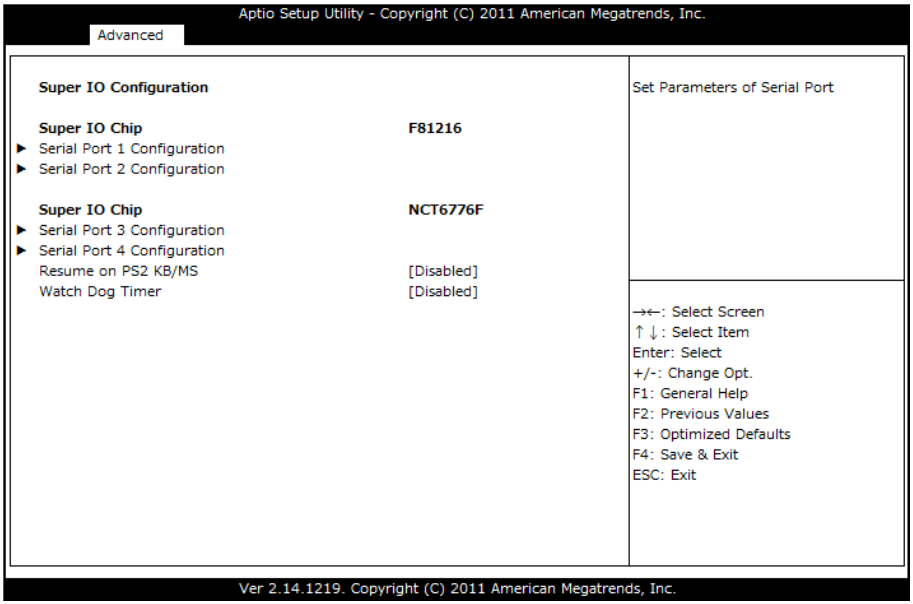


Figure 5.10. Super I/O Configuration

Items that can be configured for Super I/O Configuration are described in the table below.

Table 5.9. Super I/O Configuration

Item	Option	Explanation
Resume on PS2 KB/MS	Enabled [Disabled]	Enable or Disable Resume on PS2 Keyboard and Mouse function.
Watch Dog Timer	Enabled [Disabled]	Enable or Disable Watch Dog Timer function.
Watch Dog Timer Count Mode	[Second Mode] Minute Mode	Select Watch Dog Timer's Mode.
Watch Dog Timer Time out Value	[60]	Select Watch Dog Timer's Time out value. Value = 1..255

The following sub items are available:

- Serial Port x Configuration (x = 1..4)

Use this menu to specify settings for serial ports 1 to 4.

Serial Port 1 Configuration

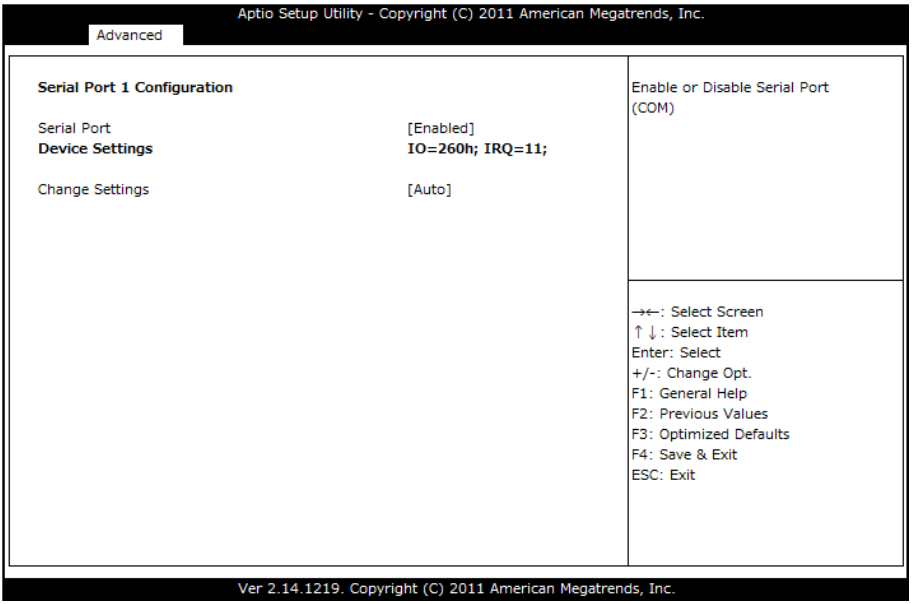


Figure 5.11. Serial Port 1 Configuration

Items that can be configured for Serial Port 1 Configuration are described in the table below.

Table 5.10. Serial Port 1 Configuration

Item	Option	Explanation
Serial Port	Disabled [Enabled]	Enable or Disable Serial Port (COM)
Change Settings	[Auto] IO=260h; IRQ=11; IO=260h; IRQ=10,11,12; IO=268h; IRQ=10,11,12; IO=270h; IRQ=10,11,12; IO=278h; IRQ=10,11,12;	Select an optimal setting for Super IO device.

Serial Port 2 Configuration

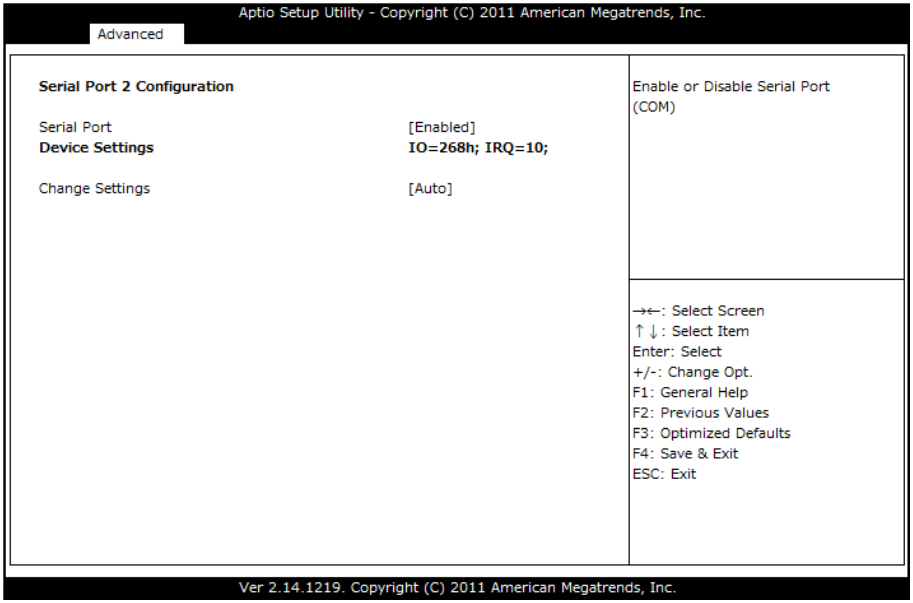


Figure 5.12. Serial Port 2 Configuration

Items that can be configured for Serial Port 2 Configuration are described in the table below.

Table 5.11. Serial Port 2 Configuration

Item	Option	Explanation
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Change Settings	Auto IO=260h; IRQ=11; IO=260h; IRQ=10,11,12; IO=268h; IRQ=10,11,12; IO=270h; IRQ=10,11,12; IO=278h; IRQ=10,11,12;	Select an optimal setting for Super IO device.

Serial Port 3 Configuration

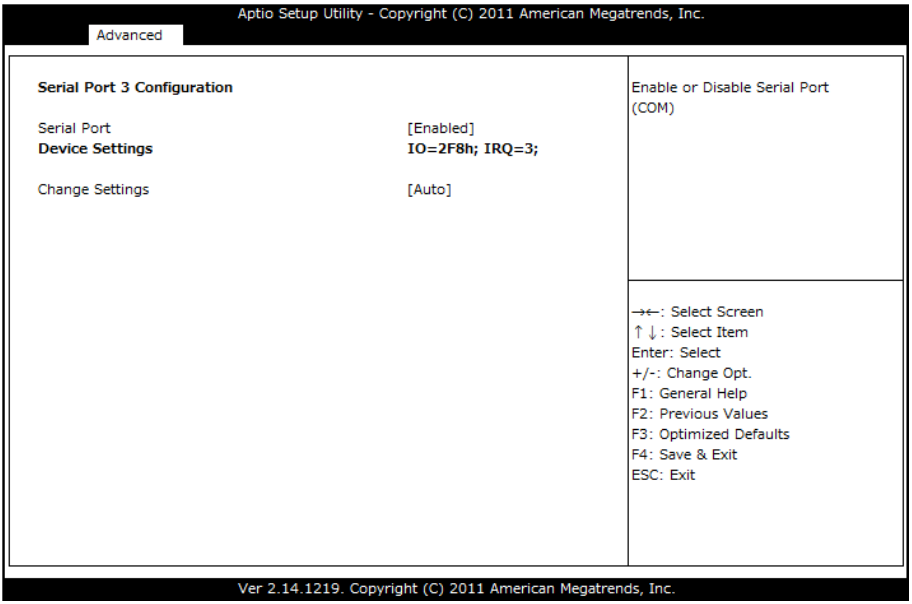


Figure 5.13. Serial Port 3 Configuration

Items that can be configured for Serial Port 3 Configuration are described in the table below.

Table 5.12. Serial Port 3 Configuration

Item	Option	Explanation
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Change Settings	Auto IO=2F8h; IRQ=3; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO device.

Serial Port 4 Configuration

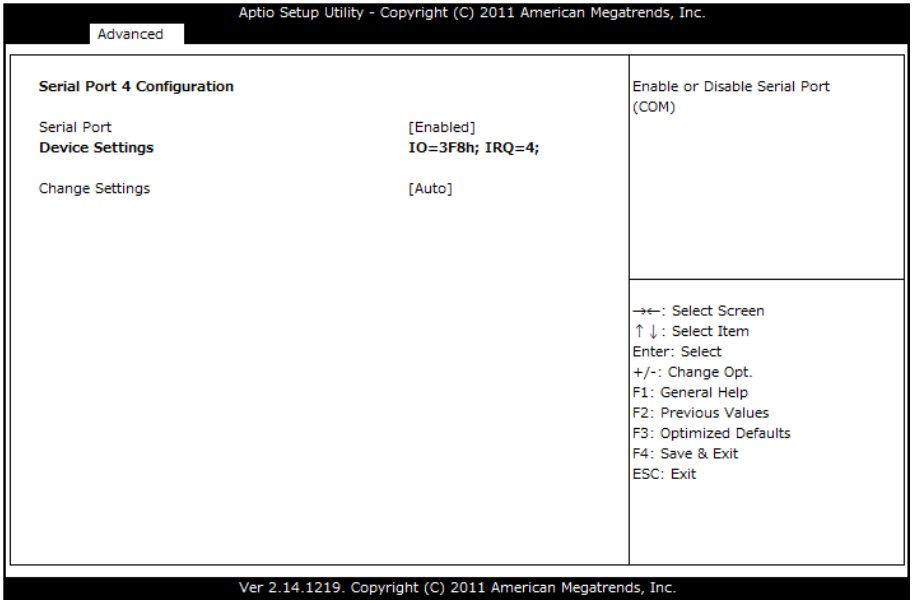


Figure 5.14. Serial Port 4 Configuration

Items that can be configured for Serial Port 4 Configuration are described in the table below.

Table 5.13. Serial Port 4 Configuration

Item	Option	Explanation
Serial Port	Disabled [Enabled]	Enable or Disable Serial Port (COM)
Change Settings	[Auto] IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO device.

H/W Monitor

Use this menu to check CPU temperature, system temperature, input voltage, and other system conditions.

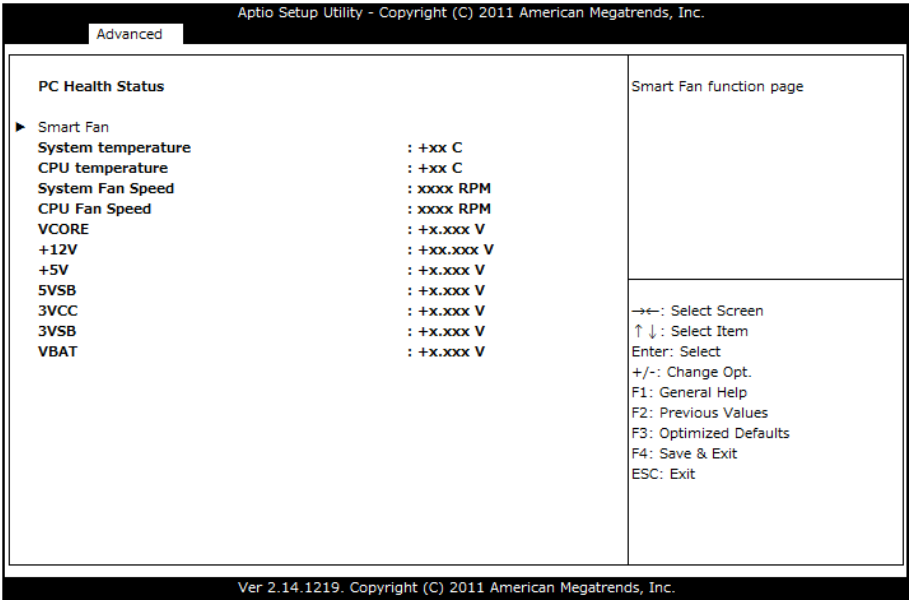


Figure 5.15. H/W Monitor

The following sub items are available:

- Smart Fan

Use this menu to specify settings for Smart Fan.

Smart Fan

Use this menu to specify Smart Fan settings.

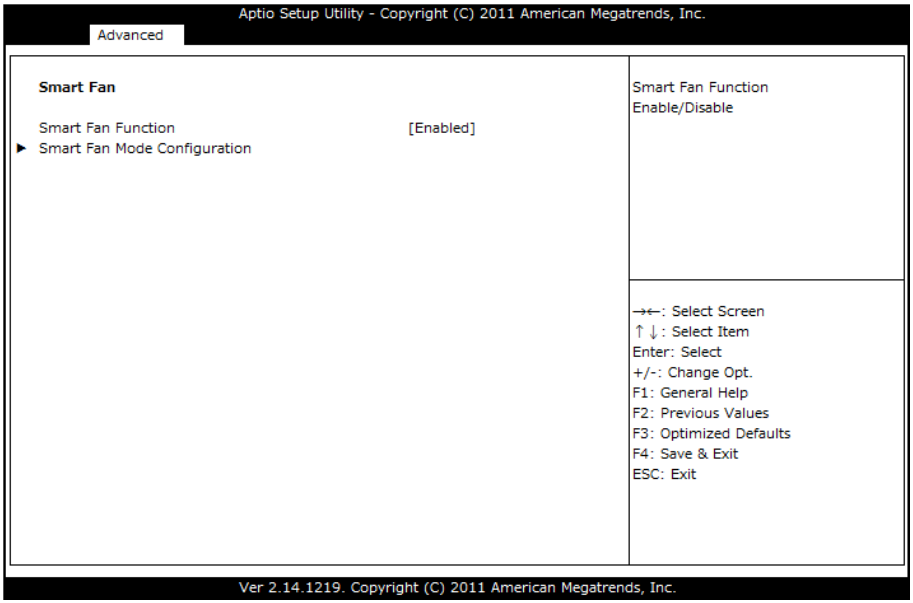


Figure 5.16. Smart Fan menu

Items that can be configured for Smart Fan Configuration are described in the table below.

Table 5.14. Smart Fan Configuration

Item	Option	Explanation
Smart Fan Function	Disabled [Enabled]	Enable or Disable Smart Fan function.

The following sub items are available:

- Smart Fan Mode Configuration

Use this menu to specify the Mode of Smart Fan.

Smart Fan Mode Configuration

Use this menu to specify Smart Fan Mode settings.

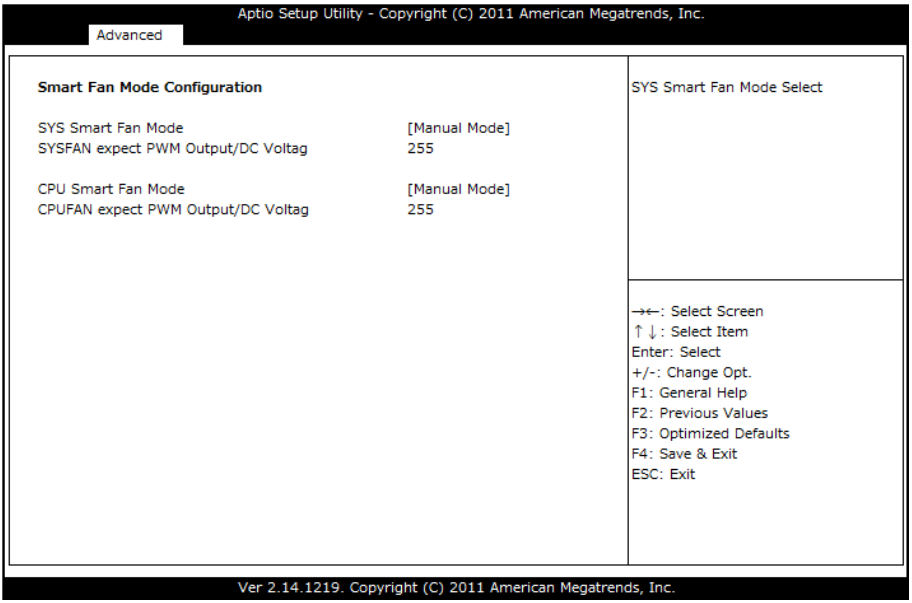


Figure 5.17. Smart Fan Mode Configuration menu

Items that can be configured for Smart Fan Mode Configuration are described in the table below.

Table 5.15. Smart Fan Mode Configuration

Item	Option	Explanation
SYS Smart Fan Mode	[Manual Mode] Thermal Cruise Mode	System Smart Fan Mode.
SYSFAN expect PWM Output/DC Voltage	[255]	Select System Fan expect PWM Output/DC Voltage. Value: 70 – 255 Note: This item can setting only when SYS Smart Fan Mode = Manual Mode.
SYSFAN Target Temperature	[50]	Select System Fan Target Temperature. Value: 1 – 127 Note: This item can setting only when SYS Smart Fan Mode = Thermal Cruise Mode.
SYSFAN Tolerance of Target Temperature	[5]	Select System Fan Tolerance of Target Temperature. Value: 1 – 15 Note: This item can setting only when SYS Smart Fan Mode = Thermal Cruise Mode.
SYSFAN StartUp/Stop Value	[127]	Select System Fan StartUP/Stop Value. Value: 1 – 255 Note: This item can setting only when SYS Smart Fan Mode = Thermal Cruise Mode.
CPU Smart Fan Mode	[Manual Mode] Thermal Cruise Mode	CPU Smart Fan Mode.
CPU expect PWM Output/DC Voltage	[255]	Select CPU Fan expect PWM Output/DC Voltage. Value: 70 – 255 Note: This item can setting only when CPU Smart Fan Mode = Manual Mode.
CPU Target Temperature	[50]	Select CPU Fan Target Temperature. Value: 1 – 127 Note: This item can setting only when CPU Smart Fan Mode = Thermal Cruise Mode.
CPU Tolerance of Target Temperature	[5]	Select CPU Fan Tolerance of Target Temperature. Value: 1 – 15 Note: This item can setting only when CPU Smart Fan Mode = Thermal Cruise Mode.
CPU StartUp/Stop Value	[127]	Select CPU Fan StartUP/Stop Value. Value: 1 – 255 Note: This item can setting only when CPU Smart Fan Mode = Thermal Cruise Mode.

Option Rom Policy

Use this menu to specify Option Rom Policy settings.

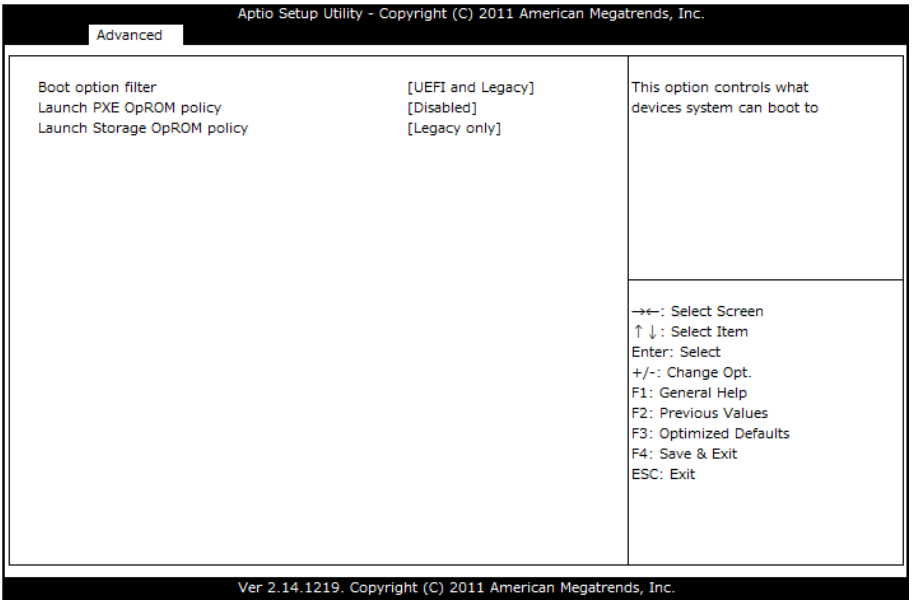


Figure 5.18. Option Rom Policy menu

Items that can be configured for Option Rom Policies are described in the table below.

Table 5.16. Option Rom Policy

Item	Option	Explanation
Boot option filter	[UEFI and Legacy] Legacy only UEFI only	This option controls what devices system can boot to.
Launch PXE OpROM policy	[Disabled] Enabled	Controls the execution of UEFI and Legacy PXE OpROM.
Launch Strage OpROM policy	Do not launch UEFI only [Legacy only]	Controls the execution of UEFI and Legacy Strage OpROM.

CPU PPM Configuration

Use this menu to specify CPU PPM Configurations.

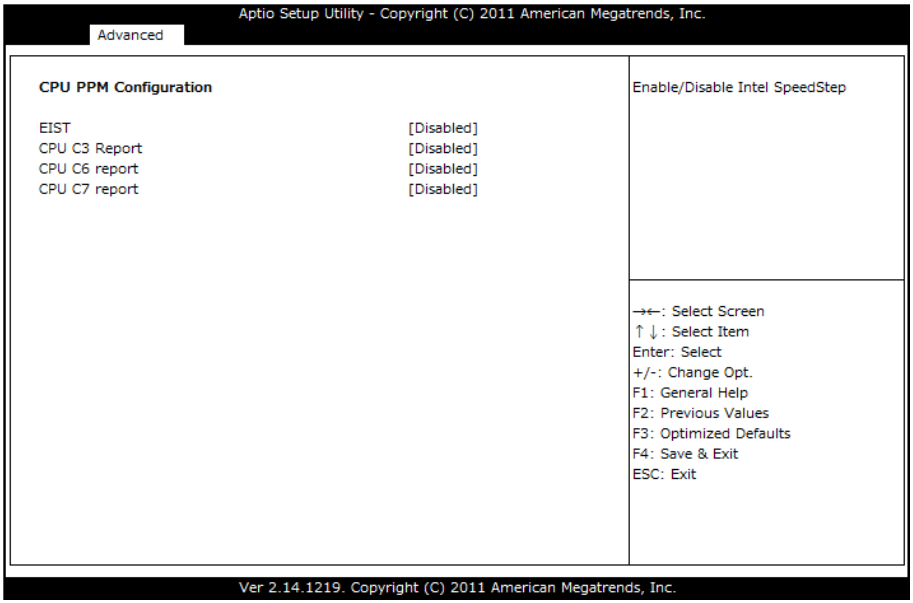


Figure 5.19. CPU PPM Configuration menu

Items that can be configured for CPU PPM Configurations are described in the table below.

Table 5.17. CPU PPM Configuration

Item	Option	Explanation
EIST	[Disabled] Enabled	Enable or Disable Intel SpeedStep.
CPU C3 Report	[Disabled] Enabled	Enable or Disable CPU C3 (ACPI C2) report to OS.
CPU C6 report	[Disabled] Enabled	Enable or Disable CPU C6 (ACPI C3) report to OS.
CPU C7 report	[Disabled] Enabled	Enable or Disable CPU C7 (ACPI C3) report to OS.

Chipset

Use this menu to specify chipset settings.

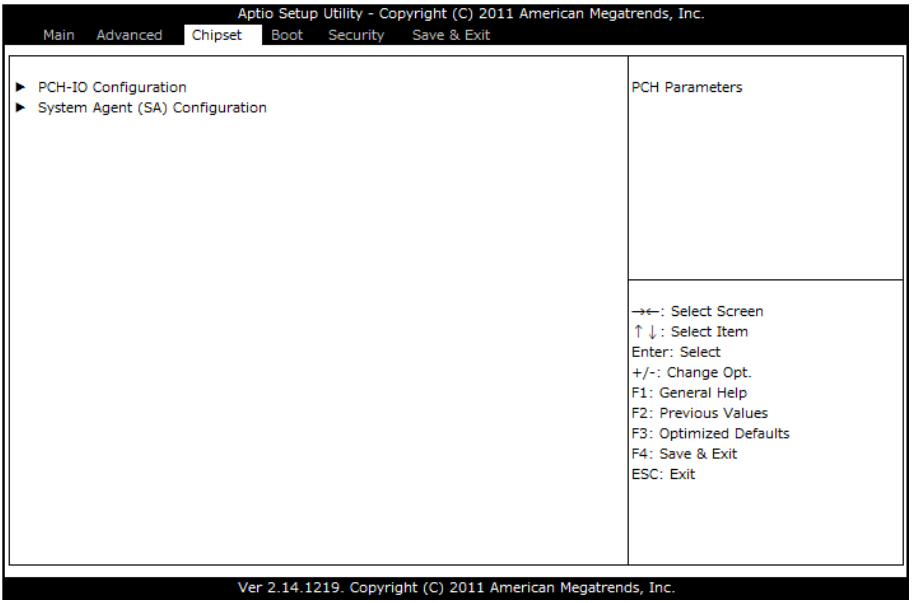


Figure 5.20. Chipset menu

The following sub items are available:

- PCH-IO Configuration

Use this menu to specify the PCH-IO configuraion.

- System Agent (SA) Configuration

Use this menu to specify the system agent configuration

PCH-IO Configuration

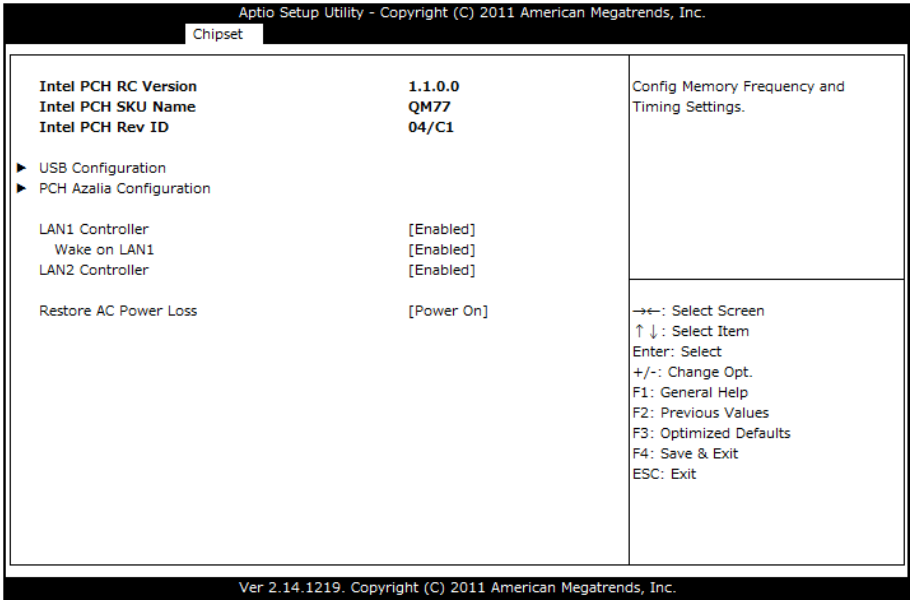


Figure 5.21. PCH-IO Configuration

Items that can be configured for PCH-IO Configurations are described in the table below.

Table 5.18. PCH-IO Configuration

Item	Option	Explanation
LAN1 Controller	[Enabled] Disabled	Enable or Disable LAN1 Controller.
Wake on LAN1	[Enabled] Disabled	Enable or Disable Wake on LAN1.
LAN2 Controller	[Enabled] Disabled	Enable or Disable LAN2 Controller.
Restore AC Power Loss	Power Off [Power On] Last State	Select AC Power state when power is re-applied after a power failure.

The following sub items are available:

- USB Configuration

- PCH Azalia Configuration

USB Configuration

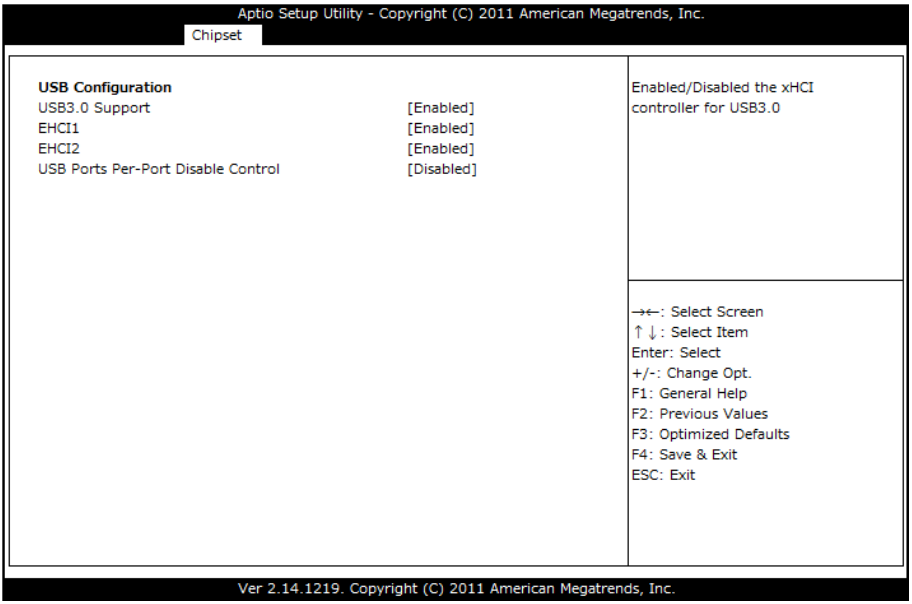


Figure 5.22. USB Configuration

Items that can be configured for USB Configurations are described in the table below.

Table 5.19. USB Configuration

Item	Option	Explanation
USB3.0 Support	[Enabled] Disabled	Enable or Disable the xHCI (USB 3.0) controller.
EHCI1	Disabled [Enabled]	Control the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.
EHCI2	Disabled [Enabled]	Control the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.
USB Ports Per-Port Disable Control	[Disabled] Enabled	Control each of the USB ports disabling.
USB Port #x Disable	Disabled [Enabled]	Disable USB Port. x: 1 – 8 Note: This item can setting only when USB Ports Per-Port Disable Control=Enabled.

PCH Azalia Configuration

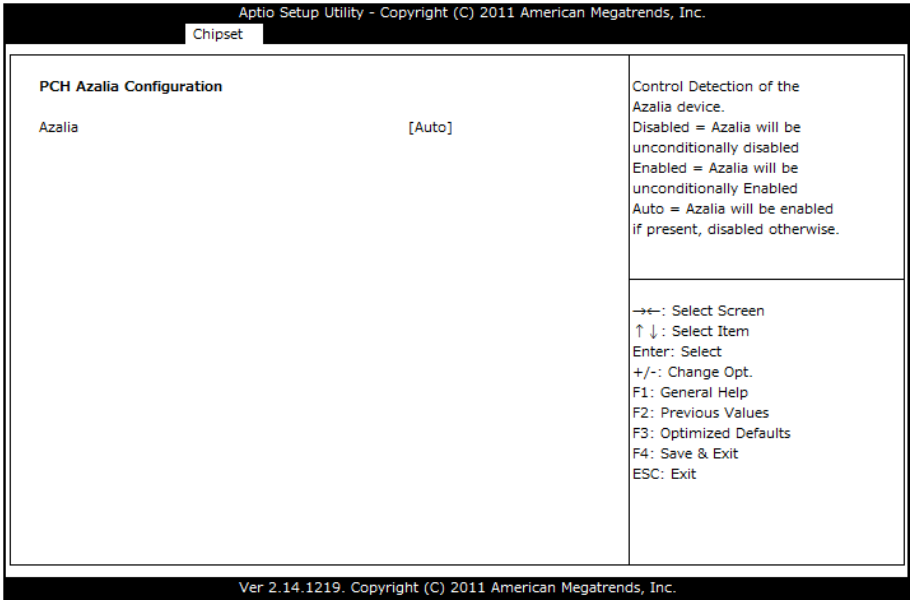


Figure 5.23. PCH Azalia Configuration

Items that can be configured for PCH Azalia are described in the table below.

Table 5.20. PCH Azalia Configuration

Item	Option	Explanation
Azalia	Disabled Enabled Auto	Control Detection of the Azalia device.

System Agent (SA) Configuration

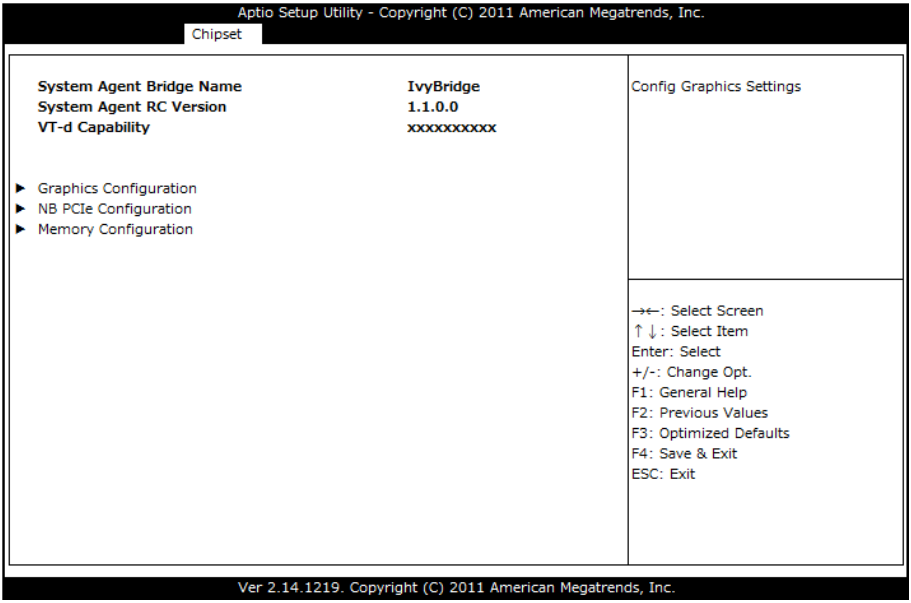


Figure 5.24. System Agent (SA) Configuration

The following sub items are available:

- Graphics Configuration

- NB PCIe Configuration

- Memory Configuration

Graphics Configuration

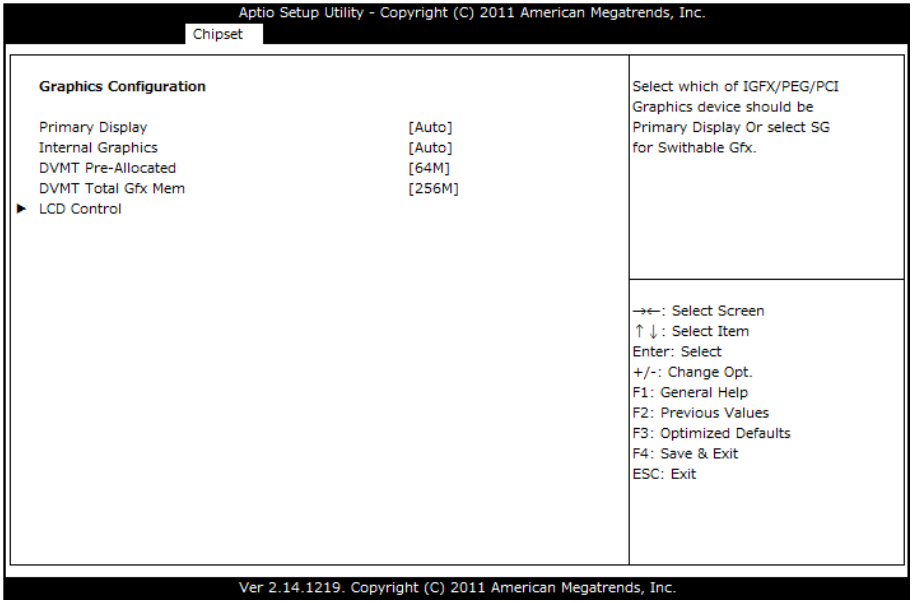


Figure 5.25. Graphics Configuration

Items that can be configured for Graphics are described in the table below.

Table 5.21. Graphics Configuration

Item	Option	Explanation
Primary Display	[Auto] IGFX PEG	Select which of IGFX/PEG/PCI Graphics device should be Primary Display.
Internal Graphics	[Auto] Disabled Enabled	Keep IGD enabled based on the setup options.
DVMT Pre-Allocated	32M [64M] 96M 128M 160M 192M 224M 256M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory Size used by the Internal Graphics Device.
DVMT Total Gfx Mem	128M [256M] MAX	Select DVMT 5.0 Total Graphics Memory Size used by the Internal Graphics Device.

The following sub items are available:

- LCD Control

Use this menu to specify the LCD Control.

LCD Control

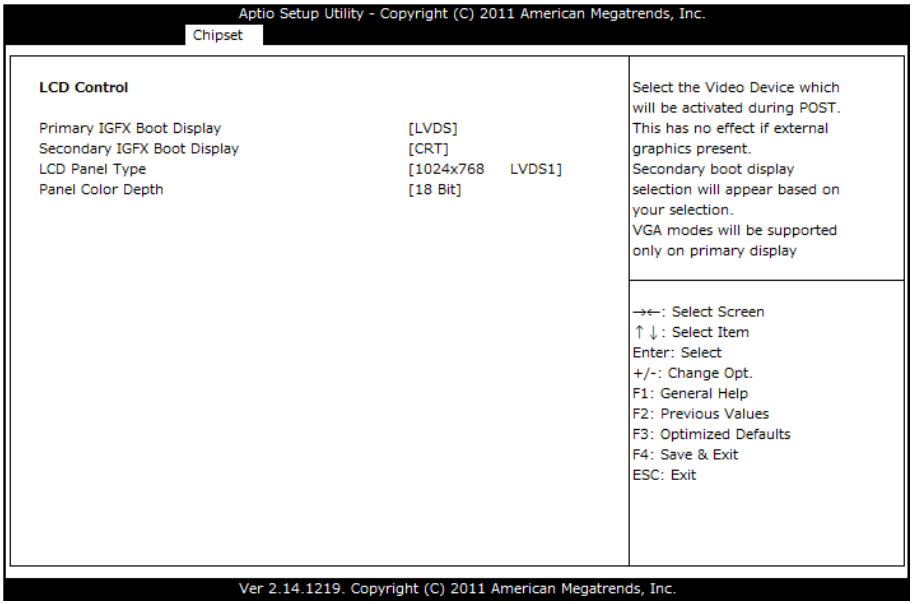


Figure 5.26. LCD Control

Settings that can be configured in the LCD Control are described in the table below.

Table 5.22. LCD Control

Item	Option	Explanation
Primary IGFX Boot Display	VBIOS Default CRT HDMI [LVDS] DVI	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display
Secondary IGFX Bott Display	Disabled [CRT] HDMI LVDS DVI	Select Secondary Display Device.
LCD Panel Type	For PT-S1000HX: [1024x768 LVDS1] For PT-S1000XSX: [1280x1024 LVDS1]	Select LCD panel used by Internal Graphics Device by selecting the aooropriate setup item. Note: Please don't change this item.
Panel Color Depth	For PT-S1000HX: [18 Bit] For PT-S1000XSX: [24 Bit]	Select the LFP Panel Color Depth. Note: Please don't change this item.

NB PCIe Configuration

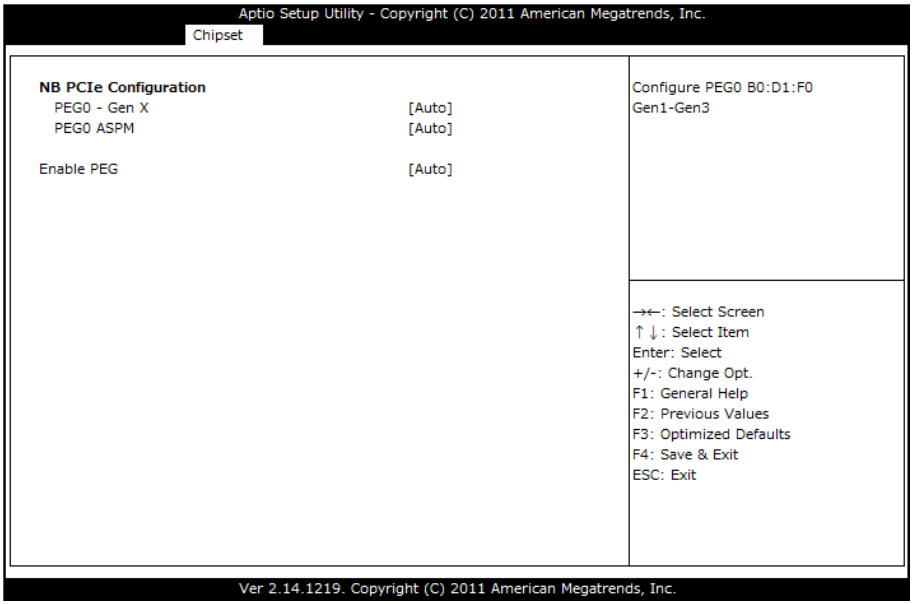


Figure 5.27. NB PCIe Configuration

Settings that can be configured in the NB PCIe Configuration are described in the table below.

Table 5.23. NB PCIe Configuraiton

Item	Option	Explanation
PEG0 – Gen X	[Auto] Gen1 Gen2 Gen3	Configure PEG0 Gen 1 – Gen 3.
PEG0 ASPM	Disabled [Auto] ASPM L0s ASPM L1 ASPM L0sL1	Control ASPM Support for the PEG0. This has no effect if PEG is not the currently active device.
Enable PEG	Disabled Enabled [Auto]	To Enable or Disable the PEG.

Memory Configuration

Use this menu to check Memory Informations.

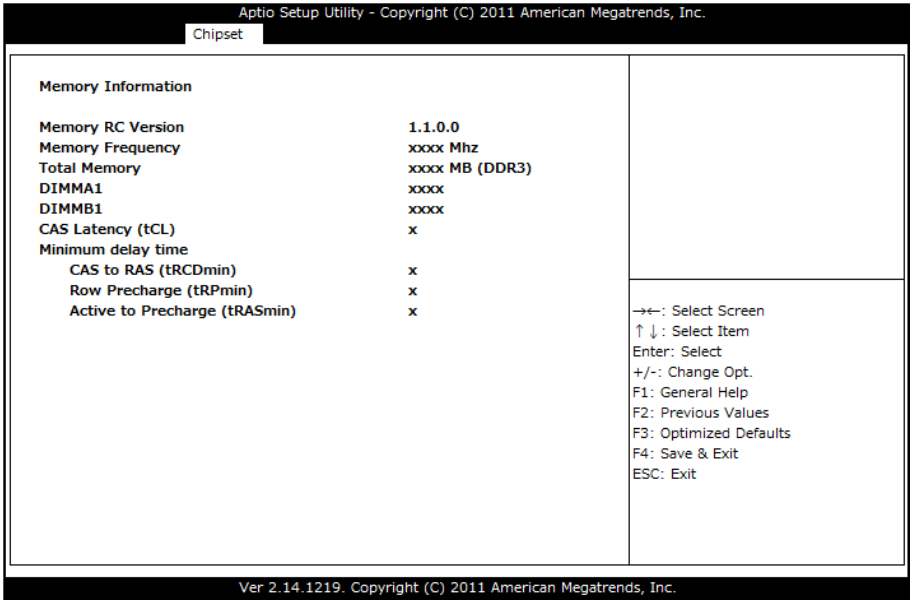


Figure 5.28. Memory Configuration

Boot

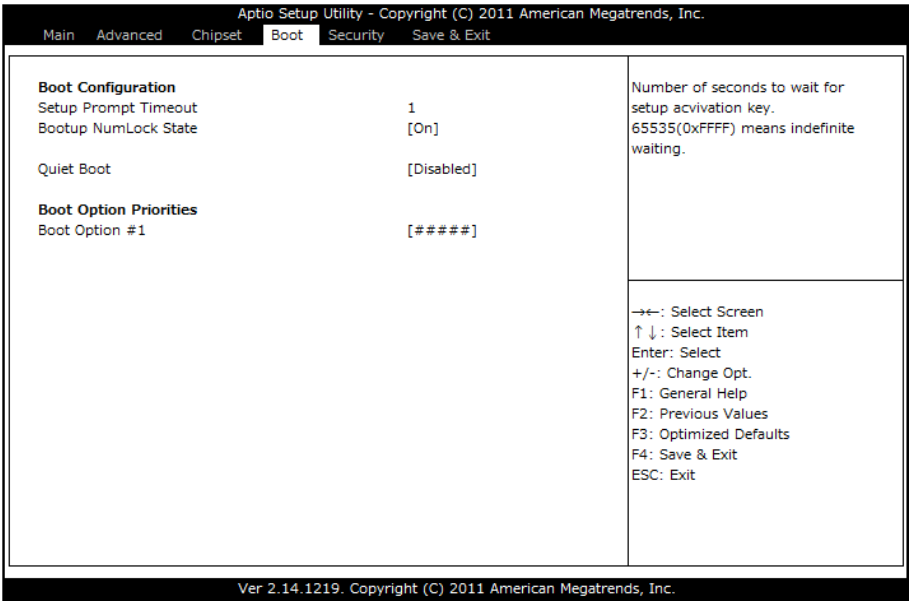


Figure 5.29. Boot menu

Use this menu to specify settings related to system startup. The following items are available:

Table 5.24. Boot

Item	Option	Explanation
Setup Prompt Timeout	1 - 65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Enabled Disabled	Enables or disables Quiet Boot option
Boot Option #x		Sets the system boot order

Security

Use this menu to configure system security settings.

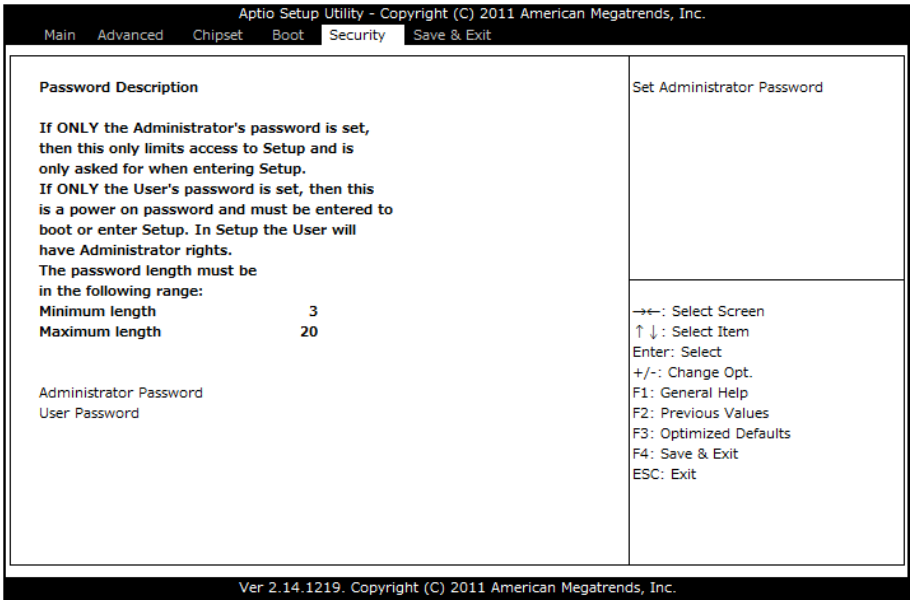


Figure 5.30. Security menu

The following items are available:

- Administrator Password

Press Enter key to input password as follows.

Create New Password	[****]
Confirm New Password	[****]

Enter a password of between 3 and 20 characters twice.

If you want to disable password, enter the input menu of “Administrator Password” again.

Enter Current Password	[****]
Create New Password	[]
Confirm New Password	[]

If you input current password to the first form and input no characters to the second and the third form, password will be disabled.

- User Password

Press Enter key to input password as follows.

Create New Password	[****]
Confirm New Password	[****]

Enter a password of between 3 and 20 characters twice.

The procedure for disabling the password is the same as that for the Administrator Password.

Save & Exit

Use this menu to load/save settings changes, and exit the setup menu

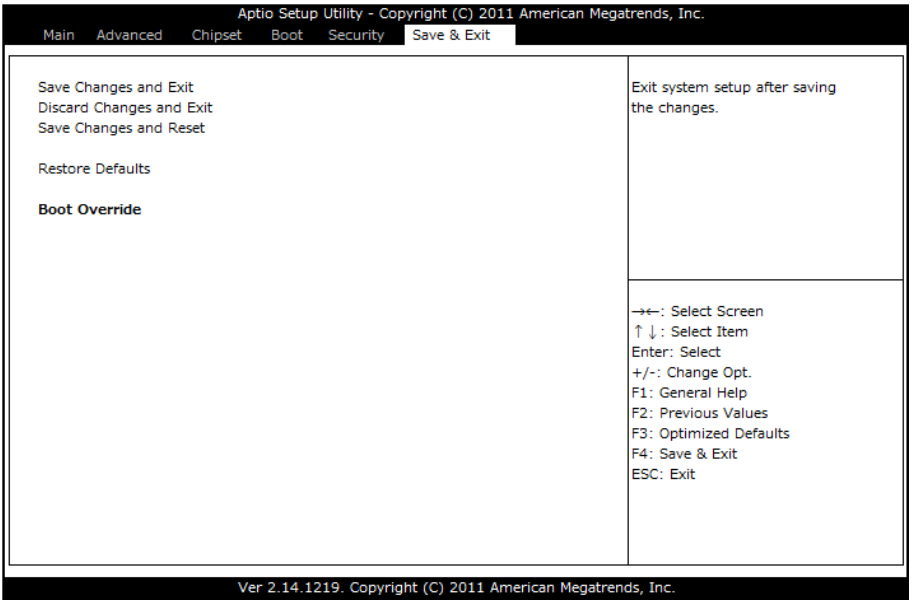


Figure 5.31. Save & Exit menu

The following items are available:

- Save Changes and Exit

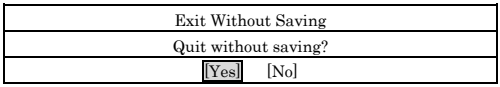
Pressing <Enter> key shows confirmation dialog box, and shows the message below.

Save & Exit Setup
Save configuration and exit?
[Yes] [No]

Pressing [Yes] saves any changes made in FLASH ROM and then restarts the system or continues to boot as necessary. The next time the computer is booted, the BIOS configures the system based on the configuration stored in FLASH ROM.
Pressing [No] lets you go back to setup menu.

- Discard Changes and Exit

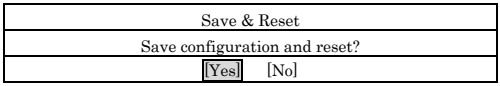
Pressing <Enter> key shows confirmation dialog box, and shows the message below.



Pressing [Yes] continues to boot the system without saving any changes made in FLASH ROM.
Pressing [No] lets you go back to setup menu without storing it in FLASH ROM.

- Save Changes and Reset

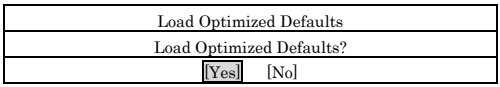
Pressing <Enter> key shows confirmation dialog box, and shows the message below.



Pressing [Yes] saves any changes made in FLASH ROM and reboots the system. The next time the computer is booted, the BIOS configures the system based on the configuration stored in FLASH ROM.
Pressing [No] lets you go back to setup menu.

- Restore Defaults

Pressing <Enter> key shows confirmation dialog box, and shows the message below.



Pressing [Yes] loads the default values that are factory settings for optimal performance system operations. This setting will not be stored in FLASH ROM before saving it.
Pressing [No] lets you go back to setup menu without loading it.

- Boot Override

Using the cursor to select the device that you want to start and pressing <Enter> key directly boots the selected device regardless of the order set in the Boot menu.

POST Beep

POST Beep indicates that a video error has occurred, or that no memory is installed. It indicates the BIOS cannot initialize the video screen to display any additional information.

6. Appendix

Memory Map

Table 6.1. Memory Map

Memory Segments	Comments
00000h - 9FFFh	0 - 640K DOS Region
A0000h – BFFFFh	Video Buffer
B0000h - B7FFFh	Monochrome Adapter range
C0000h – CFFFFh	Video BIOS
D0000h – DFFFFh	Expansion Area
E0000h – EFFFFh	Extended System BIOS Area
F0000h – FFFFFh	System BIOS Area
100000h – FFFFFFFFh	Extended Memory Area
100000h - 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,	APIC Configuration space
FFE00000h – FFFFFFFFh	High BIOS Area

I/O Port Addresses

Table 6.2. I/O Port Addresses ***< 1 / 2 >***

Address	Size	Description
0000 - 001F	32 bytes	DMA controller
0020 - 0021	2 bytes	Interrupt controller
0024 - 0025	2 bytes	Interrupt controller
0028 - 0029	2 bytes	Interrupt controller
002C – 002D	2 bytes	Interrupt controller
002E – 002F	2 bytes	LPC SIO
0030 – 0031	2 bytes	Interrupt controller
0034 - 0035	2 bytes	Interrupt controller
0038 - 0039	2 bytes	Interrupt controller
003C – 003D	2 bytes	Interrupt controller
0040 - 0043	4 bytes	Timer / Counter
004E – 004F	2 bytes	LPC SIO
0050 - 0053	4 bytes	Timer / Counter
0060	1 byte	Microcontroller / Keyboard controller
0061	1 byte	NMI controller
0062	1 byte	Microcontroller
0064	1 byte	Microcontroller / Kerboard controller
0066	1 byte	Microcontroller
0070 - 0077	8 bytes	NMI / RTC Controller
0080 – 0091	18 bytes	DMA controller / LPC / PCI
0092	1 byte	Reset Generator
0093 – 009F	13 bytes	DMA controller
00A0 – 00A1	2 bytes	Interrupt controller
00A4 – 00A5	2 bytes	Interrupt controller
00A8 – 00A9	2 bytes	Interrupt controller
00AC – 00AD	2 bytes	Interrupt controller
00B0 – 00B1	2 bytes	Interrupt controller
00B2 – 00B3	2 bytes	Power Management
00B4 – 00B5	2 bytes	Interrupt controller
00B8 – 00B9	2 bytes	Interrupt controller
00BC – 00BD	2 bytes	Interrupt controller
00C0 – 00DF	32 bytes	DMA controller
00F0	1 byte	Interrupt controller
0170 - 0177	8 bytes	IDE / SATA controller, PCI
01F0 – 01F7	8 bytes	IDE / SATA controller, PCI
0200 – 020F	16 bytes	Reserved
0260 - 0267	8 bytes	COM 1
0268 – 026F	8 bytes	COM 2
0270 – 0277	8 bytes	Reserved
0278 – 027F	8 bytes	Reserved
0290 – 029F	16 bytes	Reserved
02F8 – 02FF	8 bytes	COM 3
0376	1 byte	IDE / SATA controller, PCI
03B0 – 03BB	13 bytes	Graphics
03C0 – 03DF	32 bytes	Graphics

Table 6.2. I/O Port Addresses *< 2 / 2 >*

Address	Size	Description
03F6	1 byte	IDE / SATA controller, PCI
03F8 – 03FF	8 bytes	COM 4
0400 – 043F	64 bytes	Power management
04D0 – 04D1	2 bytes	Interrupt controller
0500 – 053F	64 bytes	GPIO / Reserved
0CF9	1 byte	Reset Generator
0D00 – 0FFFF	62208 bytes	PCI Bus

Interrupt Level List

Table 6.3. Hardware Interrupt Levels (Factory Settings)

Type	8259	Priority	Description	Vector
NMI		High	-I/O CHK	02H
IRQ0	MASTER	↑	Timer 0	08H
IRQ1	"	|	Reserved	09H
IRQ2	"	|	Interrupt Controller 2 (Slave)	0AH
IRQ8	SLAVE	|	Realtime Clock	70H
IRQ9	"	|	Reserved	71H
IRQ10	"	|	Serial Port 2	72H
IRQ11	"	|	Serial Port 1	73H
IRQ12	"	|	Reserved	74H
IRQ13	"	|	Co-processor	75H
IRQ14	"	|	Not used	76H
IRQ15	"	|	Not used	77H
IRQ3	MASTER	|	Serial port 3	0BH
IRQ4	"	|	Serial port 4	0CH
IRQ5	"	|	Reserved	0DH
IRQ6	"	↓	Not used	0EH
IRQ7	"	Low	Reserved	0FH

POST Codes

Table 6.4. POST Codes ***< 1 / 3 >***

POST (hex)	Description
< Security (SEC) phase >	
1h	Power on. Reset type detection (software / hardware)
2h	AP initialization before microcode loading
3h	North Bridge initialization before microcode loading
4h	South Bridge initialization before microcode loading
5h	OEM initialization before microcode loading
6h	Microcode loading
7h	AP initialization after microcode loading
8h	North Bridge initialization after microcode loading
9h	South Bridge initialization after microcode loading
Ah	OEM initialization after microcode loading
Bh	Cache initialization
< Pre-EFI Initialization (PEI) phase >	
10h	PEI Core is started
11h	Pre-memory CPU initialization is started
12h – 14h	Pre-memory CPU initialization (CPU module specific)
15h	Pre-memory North Bridge initialization is started
16h – 18h	Pre-Memory North Bridge initialization (North Bridge module specific)
19h	Pre-memory South Bridge initialization is started
1Ah – 1Ch	Pre-memory South Bridge initialization (South Bridge module specific)
1Dh – 2Ah	OEM pre-memory initialization codes
2Bh	Memory initialization. Serial Presence Detect (SPD) data reading
2Ch	Memory initialization. Memory presence detection
2Dh	Memory initialization. Programming memory timing information
2Eh	Memory initialization. Configuring memory
2Fh	Memory initialization (other).
30h	Reserved for ASL (see ASL Status Codes section below)
31h	Memory Installed
32h	CPU post-memory initialization is started
33h	CPU post-memory initialization. Cache initialization
34h	CPU post-memory initialization. Application Processor(s) (AP) initialization
35h	CPU post-memory initialization. Boot Strap Processor (BSP) selection
37h	CPU post-memory initialization. System Management Mode (SMM) initialization
38h	Post-Memory North Bridge initialization is started
39h – 3Ah	Post-Memory North Bridge initialization (North Bridge module specific)
3Bh	Post-Memory South Bridge initialization is started
3Ch – 3Eh	Post-Memory South Bridge initialization (South Bridge module specific)
3Fh – 4Eh	OEM post memory initialization codes
4Fh	DXE IPL is started
< Driver Execution Environment (DXE) phase >	
60h	DXE Core is started
61h	NVRAM initialization
62h	Installation of the South Bridge Runtime Services
63h	CPU DXE initialization is started
64h-67h	CPU DXE initialization (CPU module specific)
68h	PCI host bridge initialization
69h	North Bridge DXE initialization is started
6Ah	North Bridge DXE SMM initialization is started

Table 6.4. POST Codes ***< 2 / 3 >***

POST (hex)	Description
6Bh - 6Fh	North Bridge DXE initialization (North Bridge module specific)
70h	South Bridge DXE initialization is started
71h	South Bridge DXE SMM initialization is started
72h	South Bridge devices initialization
73h – 77h	South Bridge DXE Initialization (South Bridge module specific)
78h	ACPI module initialization
79h	CSM initialization
7Ah – 7Fh	Reserved for future AMI DXE codes
80h – 8Fh	OEM DXE initialization codes
90h	Boot Device Selection (BDS) phase
91h	Driver connecting is started
92h	PCI Bus initialization is started
93h	PCI Bus Hot Plug Controller Initialization
94h	PCI Bus Enumeration
95h	PCI Bus Request Resources
96h	PCI Bus Assign Resources
97h	Console Output devices connect
98h	Console Input devices connect
99h	Super IO Initialization
9Ah	USB initialization is started
9Bh	USB Reset
9Ch	USB Detect
9Dh	USB Enable
9Eh – 9Fh	Reserved for future AMI codes
A0h	IDE initialization is started
A1h	IDE Reset
A2h	IDE Detect
A3h	IDE Enable
A4h	SCSI initialization is started
A5h	SCSI Reset
A6h	SCSI Detect
A7h	SCSI Enable
A8h	Setup Verifying Password
A9h	Start of Setup
AAh	Reserved for ASL (see ASL Status Codes section below)
ABh	Setup Input Wait
ACh	Reserved for ASL (see ASL Status Codes section below)
ADh	Ready To Boot event
AEh	Legacy Boot event
AFh	Exit Boot Services event
B0h	Runtime Set Virtual Address MAP Begin
B1h	Runtime Set Virtual Address MAP End
B2h	Legacy Option ROM Initialization
B3h	System Reset
B4h	USB hot plug
B5h	PCI bus hot plug
B6h	Clean-up of NVRAM
B7h	Configuration Reset (reset of NVRAM settings)
B8h - BFh	Reserved for future AMI codes
C0h - CFh	OEM BDS initialization codes

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

POST(hex)	Description
ACPI/ASL Checkpoints	
01h	System is entering S1 sleep state
02h	System is entering S2 sleep state
03h	System is entering S3 sleep state
04h	System is entering S4 sleep state
05h	System is entering S5 sleep state
10h	System is waking up from the S1 sleep state
20h	System is waking up from the S2 sleep state
30h	System is waking up from the S3 sleep state
40h	System is waking up from the S4 sleep state
ACh	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
AAh	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

SERIAL I/O Address and Register Function

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

Table 6.5. I/O Address

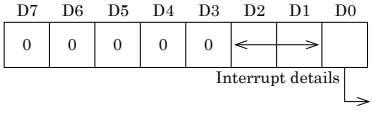
I/O address	DLAB	Read/Write	Register	
03F8H	0	W	Transmitter holding register	THR
		R	Receive buffer register	RBR
	1	W	Divisor latch register (LSB)	DLL
03F9H	1	W	Divisor latch register (MSB)	DLM
	0	W	Interrupt enable register	IER
03FAH	X	R	Interrupt ID register	IIR
03FBH	X	W	Line control register	LCR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

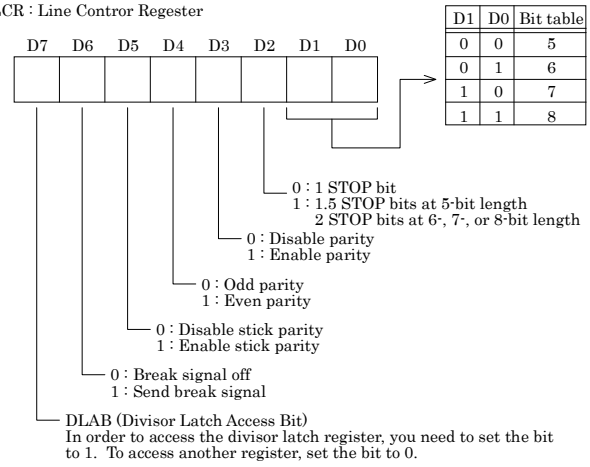
DLAB (Divisor Latch Access Bit) : The value in bit 7 of the line control register.

Table 6.6. Function of Each Register ***< 1 / 4 >***

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

Table 6.6. Function of Each Register *< 2 / 4 >*

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


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


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

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

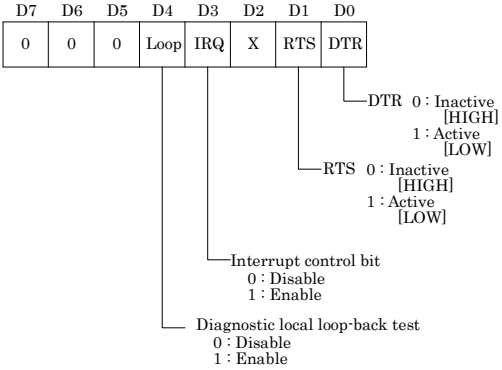
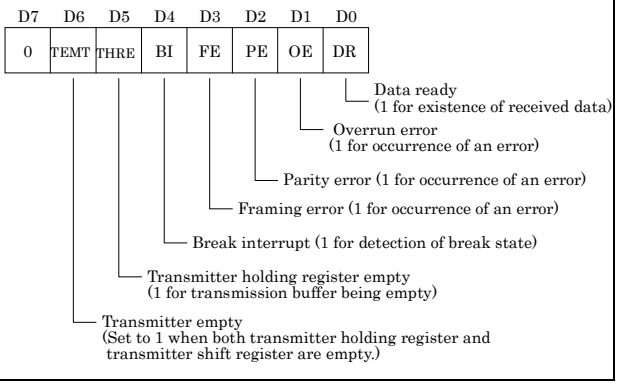
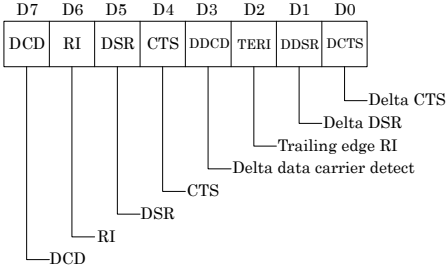
<table>
<tr><th>I/O address</th><th>Description</th></tr>
<tr><td>03FCH</td><td>MCR: Modem Control Register
 
</td></tr>
<tr><td>03FDH</td><td>LSR: Line Status Regester
 
</td></tr>
</table>

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

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

Baud Rate Settings

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

Table 6.7. Baud Rate Settings

Baud rate to be set	SERIAL A, B, C, D 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. To maintain normal system operation, consider allowable error and create a program to re-trigger the watchdog timer.

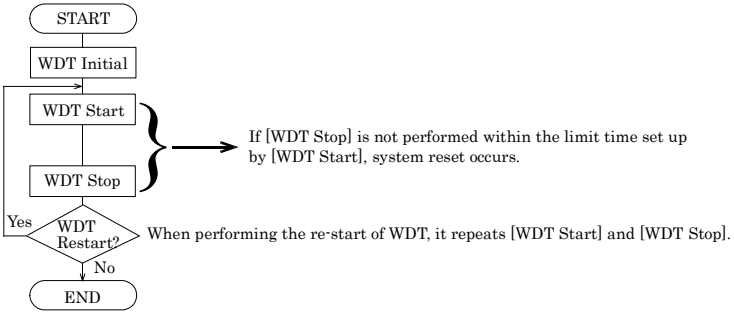
CONTEC's Web site [IPC-SLIB-01], which is bundled with this product, contains a sample program for the watchdog timer. To view the sample program for the watchdog timer, decompress "HWMandRTCut.zip", which is found under \RasUtility\Samples\Module.

For example, if the time-out interval has been set to 30 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.

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.

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

(1) Be sure the power is turned off.

(2) Remove the top cover.

(3) Remove battery.

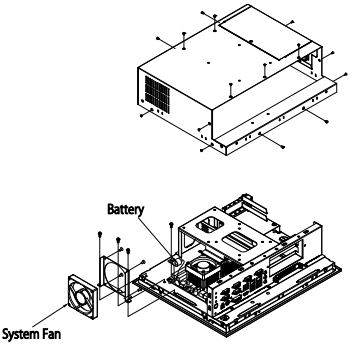


Figure 6.1. Removing the battery

Disposing the battery

Dispose the removed battery properly as instructed by local government.

7. List of Options

AC adapter

Please ask your retailer.

Hard disk

- PC-HDD100S 2.5-inch SATA HDD 100GB

Other option

- IPC-SND-03 Desk stand

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

PT-S1000 Series
User's Manual

PT-S1000HXP2-DC7000

PT-S1000XSXP2-DC7000

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