Lanner

Network Computing

Hardware Platforms for Network Computing

FW-7573 User Manual

Version: 1.8

Date of Release: 2019/03/22

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

Note: This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

Warning: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

The listed websites are links to online product information and technical support.

Resources	URL
Lanner	http://www.lannerinc.com
Product Resource	http://www.lannerinc.com/download-center
RMA	http://eRMA.lannerinc.com

Copyright and Trademarks

Acknowledgment

Compliances and Certification

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

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 a 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. The operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

Lithium Battery Caution:

- Risk of Explosion if Battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
- Installation only by a trained electrician or only by an electrically trained person who knows all English Installation and Device Specifications which are to be applied.
- Do not carry the handle of power supplies when moving to another place.
- The machine can only be used in a fixed location such as labs or computer facilities.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

EMC Notice

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 a 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 in which case users will be required to correct the interference at their own expense.

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- Portez des lunettes de sécurité pour protéger vos yeux.
- N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.

- Ne travaillez pas seul si des conditions dangereuses sont présentes.
- Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- Jetez les piles usagées conformément aux instructions.
- L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.
- La machine ne peut être utilisée qu'à un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

Sécurité de fonctionnement

L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.

- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Consignes de sécurité électrique

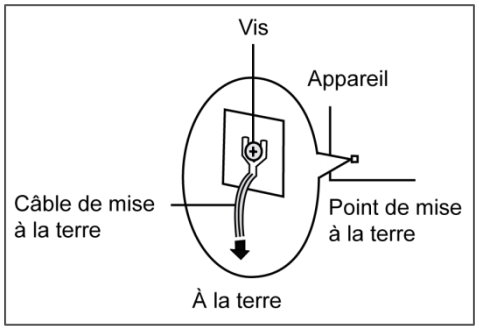
- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre

les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.

- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

Procédure de mise à la terre pour source d'alimentation CC

- Desserrez la vis du terminal de mise à la terre.
- Branchez le câble de mise à la terre à la terre.
- L'appareil de protection pour la source d'alimentation CC doit fournir 30 A de courant.
- Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.



Revision History

Version	Descriptions
0.2	Change HDD specifications by taking off the support of 1x3.5”; change the Bypass Manual download site.
1.0	Change the CPU specification to C2758/C2518 Change PCIe x8 golden finger to 2 PCIe x4 Change power supply to 150W Change two fans to only one fan
1.1	Change the board layout to take out fan 1 and fan3
1.2	Change the front panel picture; change the memory spec; change the power requirement for FW-7573B
1.3	Add hardware/software reset pin header J5
1.4	Add the J5 (hardware/software) pin header information
1.5	Added TPM description Added DB9/USB reserved holes
1.6	Modified BIOS access methods for operations under the serial console
1.7	Modified -Appendix B: Programming Generation 2 and 3 LAN Bypass -Appendix D: Programming the LCM -Appendix E: Installing Intel QuickAssist Software for Linux -Appendix A: Programming Watchdog Timer
1.8	Updated BIOS Settings

Table of Contents

CHAPTER 1: INTRODUCTION

Thank you for choosing FW-7573. This system integrates the newest Intel® Atom Processor C2000 series processor, codenamed Rangeley, with the Intel QuickAssist technology to provide a robust and high-performance communication platform. It supports up to 16GB of DDR3 system memory at 1333 or 1600 MHz on dual-channel DIMM banks.

The C2000 series processor comes with an enhanced cryptographic/content processing acceleration via integrated Intel®QuickAssist Integrated Accelerator:

- Bulk Encryption: AES, DES, 3DES, RC4
- Hash: SHA-1, MD5; SHA-2 (SHA-224, SHA-256, SHA- 384, SHA-512);
- Authentication: HMAC, AES-XCBC, AES-CCM, and AES-GCM
- Public Key Exchanges: RSA, DH, DSA, ECC

The processor also supports Intel Virtualization Technology.

The FW-7573 is equipped with advanced I/O capabilities, which incorporates a console port, one PCIe golden finger (2 PCIex4 signal) connected directly to the SoC for utmost packet processing performance and two Serial- ATA ports as well as a CompactFlash slot. The front panel also features 6 GbE ports.

The system can add an additional 8 LAN ports with 1 Ethernet module, providing a total of 14 LAN ports.

Moreover, this LAN module can be configured with Lanner Generation2 or Generation3 bypass depending on the module specification. Regarding the growing security concerns, FW-7573 includes a hardware-based TPM module for system boot-up and data protection.

Package Content

Your package contains the following items:

- FW-7573 Network Security Platform
- 1 Power cable
- 1 console cable
- Serial-ATA hard drive cable
- 1 threaded screw set
- 1 ear bracket set

Optional Accessories

The system has a variety of optional accessories; visit the following website for more information.

http://www.lannerinc.com/products/x86-network-appliances/rackmount/fw-7573

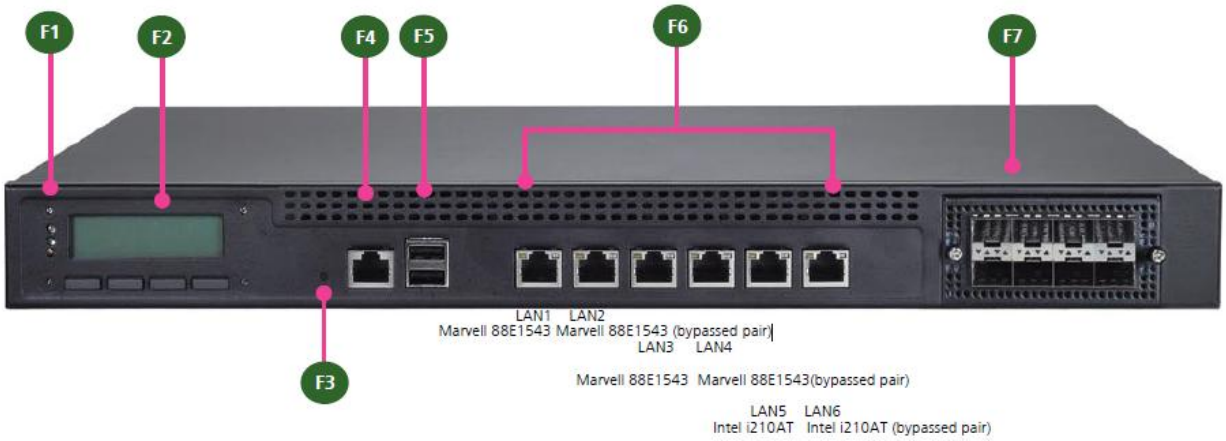
Ordering Information

SKU No.	Main Features
FW-7573A	Intel® Atom™ processor C2758, 6 GbE LAN ports with Gen.3 Bypass, 1 x NIC expansion slot, 150W ATX PSU, and TPM
FW-7573B	Intel® Atom™ processor C2518, 6 GbE LAN ports without Bypass, 1 x NIC expansion slot, 150W ATX PSU, and TPM

System Specifications

Form Factor		1U Rackmount
Platform	Processor Options	8-core Intel® Atom Processor C2000 series (Codenamed "Rangeley")
	Chipset	FW-7573A: C2758 FW-7573B: C2518
BIOS		AMI BIOS 16Mbit, TPM secure-boot
System Memory	Technology	Dual-channel DDR3 1333/1600 MHz (ECC or non-ECC, 1.5V)
	Max. Capacity	16 GB
	Socket	2 x 240-pin DIMM
Networking	Ethernet Ports	6 x GbE RJ45 onboard
	Bypass	3 pairs Generation 3 (Optional)
	Ethernet Modules	1
	Management Port	N/A
OS Support		Linux
I/O Interface	Reset Button	1 x reset button Software reset by default
	Console	1 x RJ45
	USB	2 x USB 2.0
	IPMI via OPMA slot	N/A
	Display	N/A
Storage	HDD Bays	2 x 2.5" HDD/SSD kit
	CompactFlash	1 x Type II CompactFlash
Expansion	PCIe	1 x PCI-E expansion slot (2 PCIex4 signal)
	PCI	N/A
	DB9	Reserved
	USB	Reserved
Miscellaneous	Watchdog	YES
	LCD Module	2 x 20 LCM with keypad
	Internal RTC with Li Battery	YES
Cooling	Processor	CPU heatsink with fan duct
	System	1 x Cooling Fan with smart fan control
Environmental Parameters	Temperature, ambient operating / storage	0 ~ 40° C / -20~70° C
	Humidity (RH), ambient operating / ambient non-operating	5~90%, non-condensing
Physical Dimensions	(WxDxH)	431 x 44 x 305 mm
	Weight	4 kg (8.8 lbs)
Power	Type/Watts	150W ATX Power Supply Unit
	Input	100~240V@50~60Hz
Approvals and Compliance		CE Calss A, FCC Class A, RoHS

Front Panel Features



F1 Power/Status/HDD LED

- Power: If the LED is on it indicates that the system is powered on. If it is off, it indicates that the system is powered off.
- Status: This LED is programmable. You could program it to display the operating status with the following behavior:

  If the LED is green, it indicates that the system's operational state is normal. If it is red, it indicates that the system is malfunctioning.
- HDD: If the LED blinks, it indicates data access activities; otherwise, it remains off.

F2 LCD System Panel with Keypad

- The LCD System Panel can be programmed to display operating status and configuration information.

F3 Reset Switch

- The reset switch can be used to reboot the system without turning off the power. The reset switch can act as a software or a hardware reset with jumper settings. The default is software reset. (Refer to ***Chapter 3 Motherboard Information***.)

F4 Console Port

- By using suitable rollover cable or RJ-45 to DB-9 console cable, you can connect to a computer terminal for diagnostic or configuration purpose. Terminal Configuration Parameters: 115200 baud, 8 data bits, no parity, 1 stop bit , no flow control.

F5 Two USB 2.0 Ports

- It connects to any USB devices, for example, a flash drive.

F6 Ethernet Ports (LAN1-LAN2: bypass pair; LAN3-LAN4: bypass pair; LAN5-LAN6: bypass pair *)

6X onboard Ethernet ports with 3 pairs of LAN bypass. These 6 GbE ports are provided by Marvell 88E1543 and Intel i210AT. *LAN5* is capable of Preboot eXecution Environment (PXE) (This feature needs to be enabled or disabled in the BIOS; the default is disabled). Three pairs (LAN1-LAN2, LAN3-LAN4, LAN5-LAN6) can be configured as LAN Bypass by using Lanner Gen3 Bypass technology when failure events occur. This feature can be enabled dynamically with a watchdog timer.

LINK/ACT (Yellow)

- On/Flashing: The port is linking and active in data transmission.
- Off: The port is not linking.

SPEED (Green/Amber)

- Amber: The connection speed is 1000Mbps.
- Green: The connection speed is 100Mbps
- Off: The connection speed is 10Mbps.

F7 Ethernet Expansion Module (optional)

- Depending on the module specification, it may support Lanner Generation 2 or Generation 3 bypass function; for more information, refer to the description of *Ethernet Expansion Module* in ***Chapter 4 BIOS Settings*** and ***Appendix B Programming Generation 2 and 3 LAN Bypass***.

Note: 1. The LAN bypass functionality is only available on model FW-7573A

2. The system can accommodate various Ethernet modules with different port number and speed. For more information, visit the Lanner product website at http://www.lannerinc.com/products/x86-network-appliances/nic-modules/F3

Slim Module	Ports	Chipset	Bypass
NCS2-IXM405A	4 10GbE SFP+	Intel® 82599	N/A
NCS2-ISM802A	8 GbE SFP Fiber	Intel® I350	N/A
NCS2-ITM202A	2 10G RJ45	Intel® X540	N/A
NSC2-ITM203A	2 10G RJ45	Intel X540	1 pair Generation3 Bypass
NCS2-IXM204A	2 10G SFP+	Intel 82599	N/A
NCS2-IXM205A	2 10G SFP+	Intel 82599	1 pair Fiber Bypass
NCS2-ISM405A	4 GbE SFP	Intel I350	2 pairs Fiber Bypass
NCS2-ISM406A	4 GbE SFP	Intel I350	N/A
NCS2-IGM428A	4 GbE RJ45	Intel I350	2 pairs Generation 3
NCS2-IGM806A	8 GbE RJ45	Intel I350	4 pairs Generation 3 Bypass
NCS2-IGM806B	8 GbE RJ45	Intel I350	N/A
NCS2-IGM808A	8 GbE RJ45	Intel I210	4 pairs G3 Bypass
NCS2-IGM808B	8 GbE RJ45	Intel I210	N/A
NCS2-ISM802A	8 GbE SFP	Intel I350	N/A

Rear Panel Features

R1 Reserved for PCIe Expansion Slot

R2 CPU Fan

- This fan has a smart fan feature which can be turned on automatically when the temperature exceeds the set threshold.

R3 Power-on Switch

- It is a switch to turn on or off the power.

R4 AC Power Socket

- The system equips an ATX 150W Power Supply.

CHAPTER 2: HARDWARE SETUP

Preparing the Hardware Installation

To access some components and perform certain service procedures, you must perform the following procedures first.

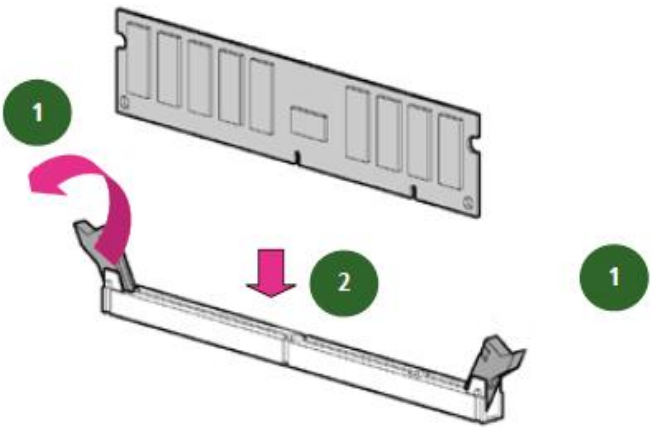
Warning: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

1. Unpower the FW-7573 and remove the power cord.
2. Unscrew 2 screws on each side and the rear of the top cover of the FW-7573 System.
3. Slide the cover backward to open it.

Installing the System Memory

The motherboard supports DDR3 memory that features data transfer rates of 1333, 1600 MHz to meet the higher bandwidth requirements of the latest operating system and Internet applications. To install the memory:

1. Open the DIMM slot latches.
2. Install the DIMM.

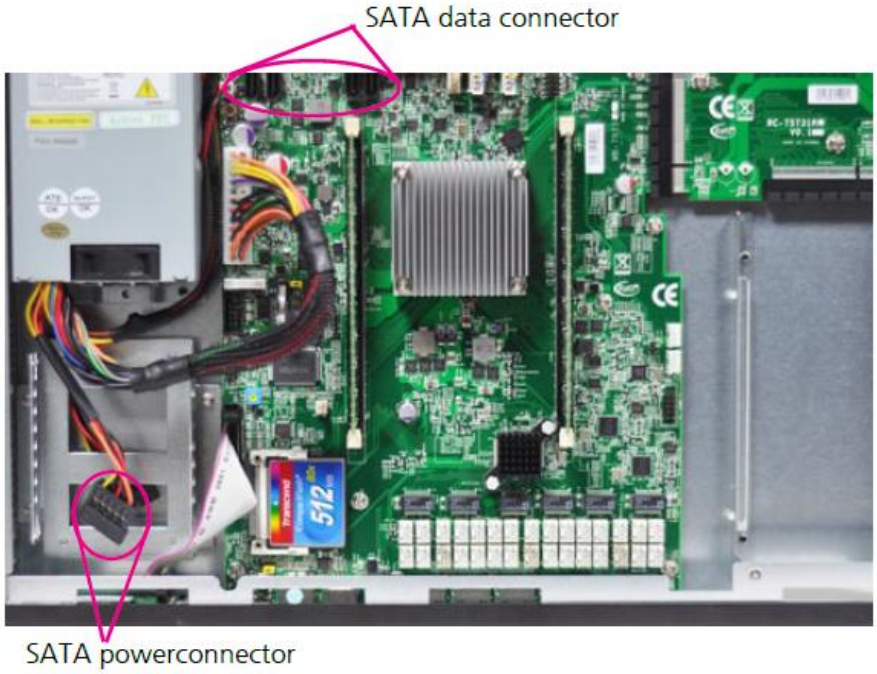


Note: 1. The system can support up to16 GB in maximum. 2. To activate dual channel, insert memory in both DIMM1 and DIMM2 slot.

Installing the Hard Disk

The system can accommodate two 2.5" Serial-ATA disks. Follow these steps to install a hard disk into the FW-7573:

1. Unscrew the 4 screws on the hard disk tray to take out the hard disk tray from the system.
2. Place a hard disk on the hard disk tray and align the holes of the hard disk with the mounting holes on the tray.
3. Secure the hard disk with 4 mounting screws on the hard disk tray.
4. Connect the Serial-ATA power and data disk cables to the hard disk's power and drive connector respectively.
5. Plug the Serial-ATA cable to the Serial-ATA Connector on the main board.
6. Put the hard disk tray with the installed hard disk back to the system and secure it with the mounting screws.



Note: Please note the orientation of the HDD tray placement when you take out the try. It is recommended that the HDD is installed in this orientation on the system.

Note: Please note the original package only includes one SATA cable (data), You need to order another cable (SATA data +power) for additional SATA HDD installation.

Installing the Front Ethernet Module

1. To install the front Ethernet module, take off the front bezel first by loosening the thumbscrews on the front of the LAN module.
2. Insert the Ethernet module into the front expansion slot. You should hear a click when the module connects to the system's main board.
3. Secure the Ethernet module by fastening the screws on the module (please use a screwdriver).

Installing the CompactFlash Card

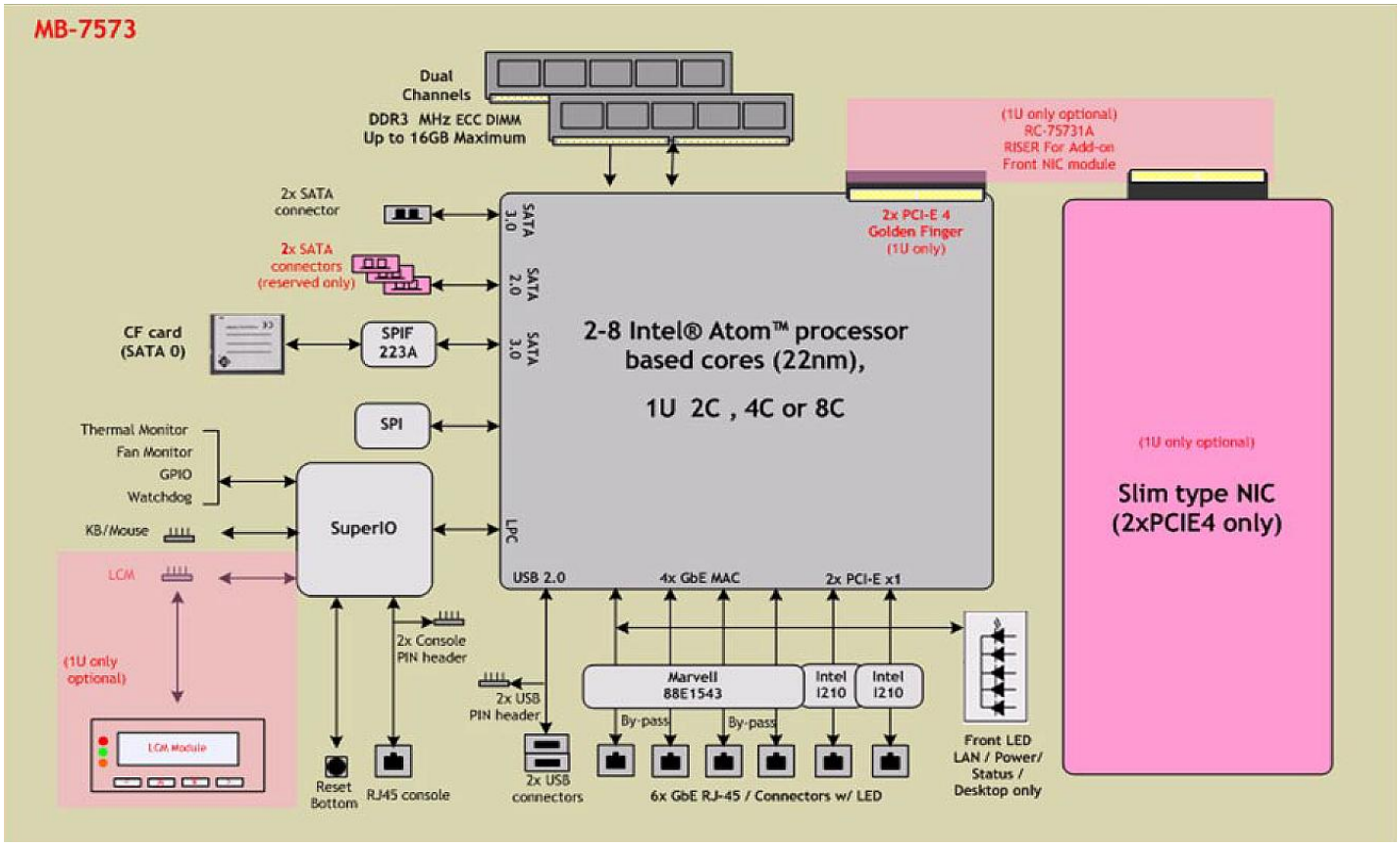
FW-7573 provides one CompactFlash slot. Follow the procedures below for installing a CompactFlash card.

1. Align CompactFlash card and the card slot with the arrow pointing toward the connector. The card fits only the correct way into the slot; do not force the card into the slot.
2. Push the card to insert into the connector.

CHAPTER 3: MOTHERBOARD INFORMATION

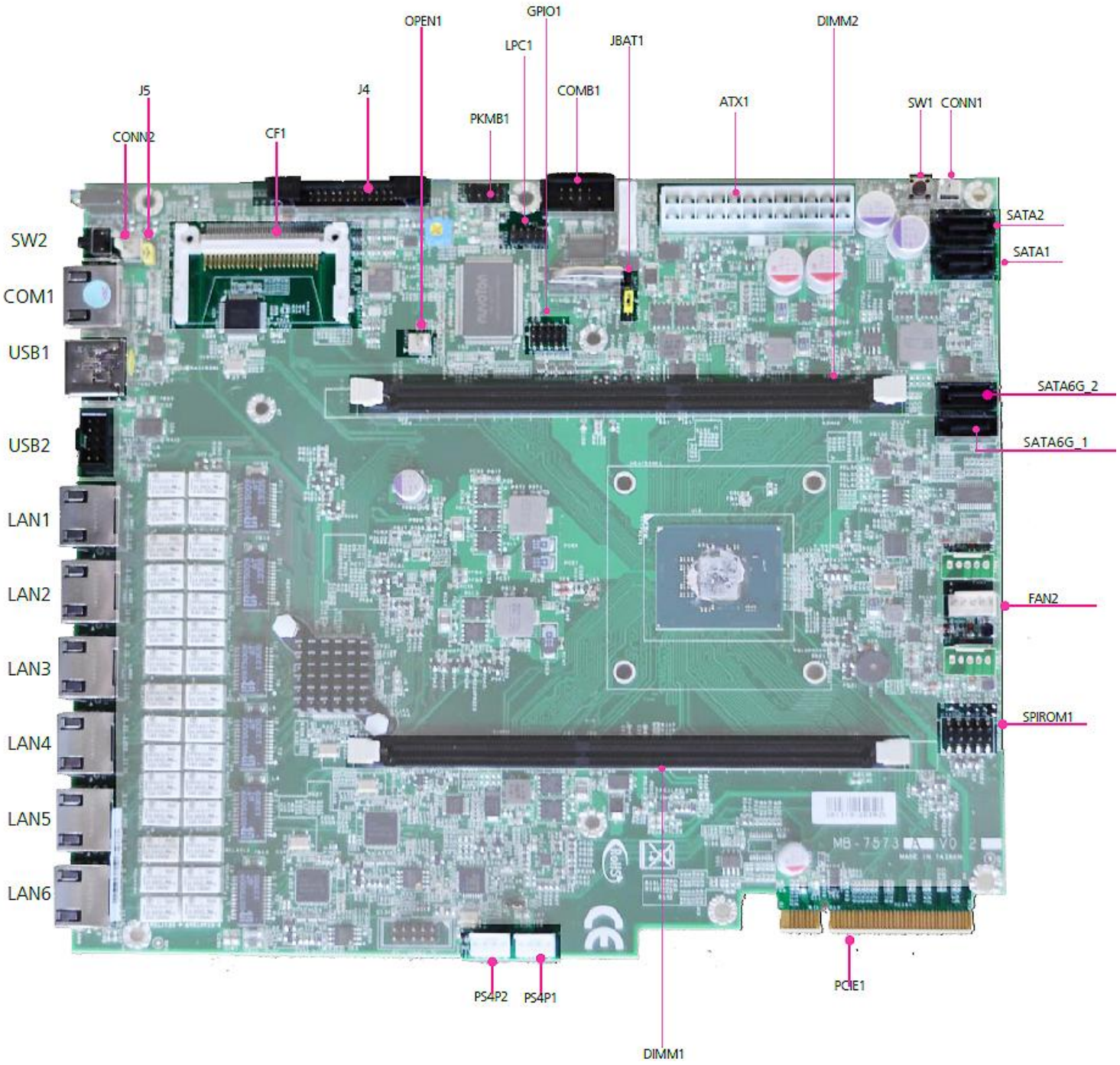
Block Diagram

The block diagram depicts the relationships between the interfaces or modules on the motherboard. Please refer to the following figure for your motherboard's layout design.



Motherboard Layout

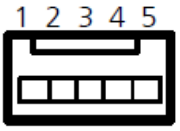
The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



Jumper Settings

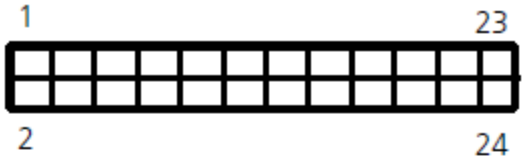
Fan Connectors (FAN2): The 5-pin connector is for connecting the CPU fan. It comes with the smart fan feature by which the fan could be monitored and turned on when the temperature exceeds the set threshold.

Pin No.	1	2	3	4	5
Function	PWM	NC	RPM Sense	+12V	Ground



Note: FAN2 (CPU) fan can be set to be in either manual mode or smart fan mode in the BIOS menu.

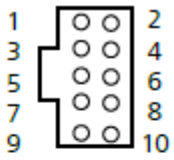
ATX Power Connector (ATX11): This 24-pin Connector is for connecting ATX power supply plugs. Find the proper orientation when inserting the plugs, for the supply plugs are designed to fit these connectors in only one orientation.



Pin No.	Signal	Pin NO.	Signal
1	+3.3V	2	+3.3V
3	Ground	4	+5V
5	Ground	6	+5V
7	Ground	8	Power Good
9	Standby 5V	10	+12V
11	+12V	12	+3.3V
13	+3.3V	14	-12V
15	Ground	16	PSON-
17	Ground	18	Ground
19	Ground	20	NC
21	+5V	22	+5V
23	+5V	24	GND

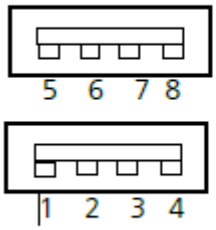
USB Connector(USB2): It is for connecting the USB module cable. It complies with USB2.0 and supports up to 480 Mbps connection speed.

USB2



Pin No.	Signal	Pin No.	Signal
1	USB_VCC	2	USB_VCC
3	USBD2-	4	USBD3-
5	USBD2+	6	USBD3+
7	Ground	8	Ground
9	Ground	10	Ground

Dual USB 2.0 Ports (USB1): This provides two USB 2.0 ports in the front panel.



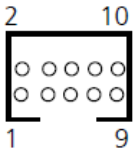
Pin No.	Signal
1	USB_VCC
2	USBD0-
3	USBD0+
4	GND
5	USB_VCC
6	USBD1-
7	USBD1+
8	GND

Console Port (COM1)

Pin No.	Signal	Pin No.	Signal
1	RTS-	6	SIN
2	DTR-	7	DSR-
3	SOUT	8	CTS-
4	GND		
5	GND		

Serial Interface Connectors (COMB1): It is for connecting the RS-232 serial port (COM2) interface cable.

COMB1



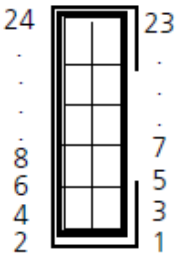
Pin No.	Signal	Pin No.	Signal
1	Data Carrier Detect (DCDB#)	2	Data Set Ready (DSRB#)
3	Receive Data (RXDB)	4	Request To Send (RTSB#)
5	Transmit Data (TXDB)	6	Clear To Send (CTSB #)
7	Data Terminal Ready (DTRB#)	8	Ring Indicator (RIB#)
9	GND	10	Key

LAN 1~4: LAN Connector(RJ-45, provided by Intel Marvell 88E1543)

LAN 5~6 Connector (RJ-45, provided by Intel Ethernet i210AT)

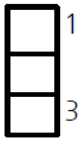
Parallel Interface for LCM (front LCD module) card

Connector (J4)



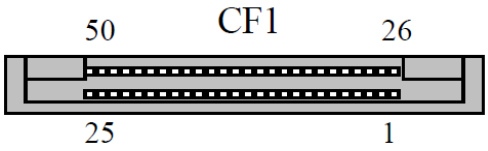
Pin No.	Signal	Pin No.	Signal
1	+5V	2	GND
3	LPT17	4	VEE
5	LPT14	6	LPT16
7	LPT3	8	LPT2
9	LPT5	10	LPT4
11	LPT7	12	LPT6
13	LPT9	14	LPT8
15	LCD-	16	VCC
17	KPA1	18	KPA2
19	KPA3	20	KPA4
21	LCM_RST	22	LED_GREEN
23	LED_YELLOW	24	HDD_LED-

Clear CMOS jumper (JBAT1): It is for clearing the CMOS memory and system setup parameters by erasing the data stored such as the system passwords in the CMOS RAM.



Pin No.	Signal
1-2 (Default)	Normal
2-3	Clear CMOS

CompactFlash Connector (CF2): It is for connecting a Compact Flash card to be served as your system's storage. The connector is a CF Type II slot which could fit both CF Type I or CF Type II cards.

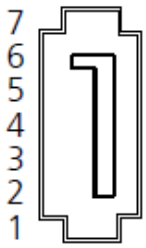


Pin No.	Signal	Pin No.	Signal
1	GND	26	CD1-
2	DATA3	27	DATA11
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	
7	CE1#	32	DATA15
8	A10	33	CE2#
9	OE#	34	VS1#
10	A9	35	IOR#
11	A8	36	IOW#
12	A7	37	WE#
13	CFVCC3	38	READY#
14	A6	39	CFVCC3
15	A5	40	CSEL
16	A4	41	VS2#
17	A3	42	RESET
18	A2	43	WAIT#
19	A1	44	INPACK#
20	A0	45	REG#
21	DATA0	46	DASP#
22	DATA1	47	DIAG#
23	DATA2	48	DATA8
24	WP	49	DATA9
25	CD2-	50	DATA10
			GND

DIMM Socket (DIMM1/DIMM2): The 240-pin DDR3 DIMM is for connecting the DDR3 1333/1600 memory. The system can support up to 16 GB in maximum with dual channel configuration. To activate dual channel, insert memory in both DIMM1 and DIMM2 slot:

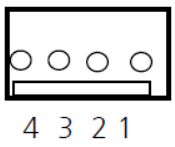
SATA Connector (SATA1/SATA2, SATA6G_1, SATA6G_2): It is for connecting a SATA hard disk to be served as your system's storage. The system can accommodate 2 disk2 (2.5) with *SATA Revision 2.0* (SATA1 and SATA2) and 3.0 standard (SATA6G_1, SATA6G_2). The controller contains two modes of operation—a legacy mode using I/O space, and an AHCI mode using memory space. Software that uses legacy mode will not have AHCI capabilities. The AHCI (Advanced Host Controller Interface) is a programming interface which defines transactions between the SATA controller and software and enables advanced performance and usability with SATA. Platforms supporting AHCI may take advantage of performance features such as no master/slave designation for SATA devices—each device is treated as a master—and hardware-assisted native command queuing. AHCI also provides usability enhancements such as Hot-Plug.

Note: 1. You will need to configure your SATA as AHCI mode in the BIOS in order to use the advanced features of SATA. To do this, access the BIOS menu under IntelRCSetup-> South Bridge Chipset Configuration->SATA Configuration. 2. Also, the hotplug enable/disable option is under the same SATA Configuration menu. Enable the hotplug function explicitly in this menu if you need it.



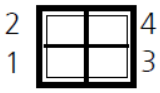
Pin No.	Signal
1	GND
2	TX_P
3	TX_N
4	GND
5	RX_N
6	RX_P
7	GND

4-Pin SATA Power Connector (PS4P1, PS4P2)



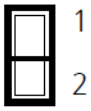
Pin No.	Signal
1	+12V
2	GND
3	Ground
4	5V

Power-switch Connector (SW1): Power tact for booting up the system.



Pin No.	Signal
1	Ground
2	Ground
3	PS_ON#
4	PS_ON#

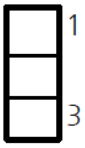
AT Mode Power Button Connector (CONN1): It is for connecting the power switch in AT mode



Pin No.	Signal
1	PS_ON#
2	GND

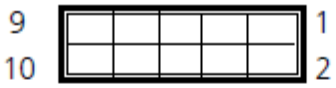
Reset Switch (SW2) and Reset Button Connector (CONN2)

Hardware/Software Reset Function (J5): It is a pin header to switch between hardware and software reset function for the front panel reset button. Hardware reset will reset the whole system while the software reset will reset the designated software to its default value.



Pin No.	Function
1-2	Hardware Reset
2-3	Software Reset (Default)

Digital GPIO (GPIO1) Connector



Pin No.	Signal	Pin No.	Signal
1	GPO4	2	GPI0
3	GPO5	4	GPI1
5	GPO6	6	GPI2
7	GPO7	8	GPI3
9	GND	10	GND

SPI-ROM Update Connector (SPI-ROM1): It is for updating the SPI Flash soldered on board for service and repair purposes.

Pin No.	Signal	Pin No.	Signal
1	NC	2	NC
3	SPI_CS0	4	V_3P3_SPI_R
5	SPI_MISO_DUAL	6	SPI_HOLD0_L
7	NC	8	SPI_CLK_DUAL
9	GND	10	SPI_MOSI_DUAL

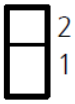
LPC I/O bus (It can also be called Port 80) (LPC1): It is a proprietary connector for connecting a checkpoint device to output checkpoints throughout booting and Power-On Self Test (POST) to indicate the task the system is currently executing.

Pin No.	Signal	Pin No.	Signal
1	CLK_33M_P80	2	LPC_AD1
3	PLTRST_P80	4	LPC_AD0
5	LPC_FRAME_N	6	P3V3
7	LPC_AD3	8	GND
9	LPC_AD2	10	GND

PCIe Expansion Connector (PCIEC1): PCIe expansion connector (two PCIe x 4) for front Ethernet module or another type of expansion through the back panel.

PIN NO.	Signal	PIN NO.	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	NC
B6	SMDAT	A6	NC
B7	GND	A7	NC
B8	+3.3V	A8	NC
B9	NC	A9	+3.3V
B10	3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PLTRST#
B12	RSVD_A	A12	GND
B13	GND	A13	REFCLK_+
B14	HSOP0_H	A14	REFCLK_-
B15	HSON0_L	A15	GND
B16	GND	A16	HSIP0_H
B17	PRSNT2#	A17	HSIN0_L
B18	GND	A18	GND
B19	HSOP1_H	A19	RSVD_B
B20	HSON1_L	A20	GND
B21	GND	A21	HSIP1_H
B22	GND	A22	HSIN1_L
B23	HSOP2_H	A23	GND
B24	HSON2_L	A24	GND
B25	GND	A25	HSIP2_H
B26	GND	A26	HSIN2_L
B27	HSOP3_H	A27	GND
B28	HSON3_L	A28	GND
B29	GND	A29	HSIP3_H
B30	RSVD_C	A30	HSIN3_L
B31	PRSNT2#	A31	GND
B32	GND	A32	RSVD_D
B33	HSOP4_H	A33	RSVD_E
B34	HSON4_L	A34	GND
B35	GND	A35	HSIP4_H
B36	GND	A36	HSIN4_L
B37	HSOP5_H	A37	GND
B38	HSON5_L	A38	GND
B39	GND	A39	HSIP5_H
B40	GND	A40	HSIN5_L
B41	HSOP6_H	A41	GND
B42	HSON6_L	A42	GND
B43	GND	A43	HSIP6_H
B44	GND	A44	HSIN6_L
B45	HSOP7_H	A45	GND
B46	HSON7_L	A46	GND
B47	GND	A47	HSIP7_H
B48	PRSNT2#	A48	HSIN7_L
B49	GND	A49	GND

Case open (OPEN1): Case opening detection pin header



Pin No.	Signal
1	GND
2	SIO_CASEOPEN#

CHAPTER 4: BIOS SETTINGS

Accessing the BIOS menu

To enter the BIOS setup utility, simply follow the steps below:

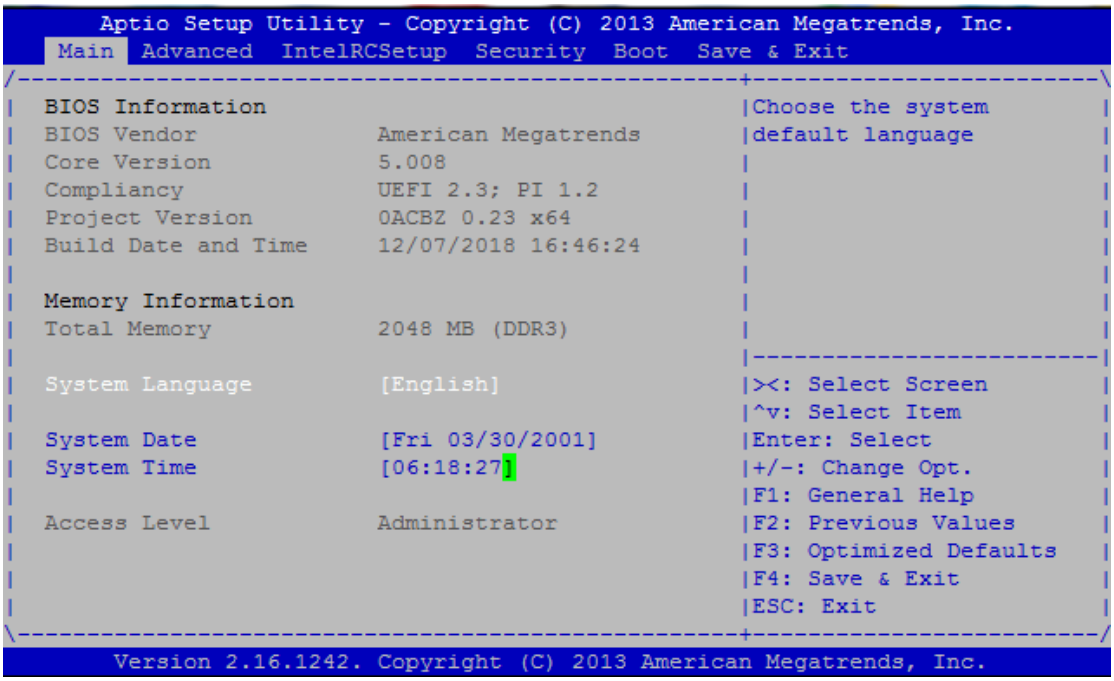
1. Boot up the system.
2. Pressing the **<Tab>** or **<Del>** key immediately allows you to enter the Setup utility, then you will be directed to the BIOS main screen. The instructions for BIOS navigations are as below:

Control Keys	Description
→←	select a setup screen
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	adjust values for the selected setup item/option
F1	display General Help screen
F2	retrieve previous values, such as the last configured parameters during the last time you entered BIOS
F3	load optimized default values
F4	save configurations and exit BIOS
<Esc>	exit the current screen

Main

The main BIOS setup menu is the first screen that you can navigate. Each main BIOS setup menu option is described in this chapter. The Main BIOS setup menu screen has two mainframes. The left frame displays all the options that can be configured. "Grayed-out" options are configured parameters and cannot be modified. On the other hand, Options in blue can be modified.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

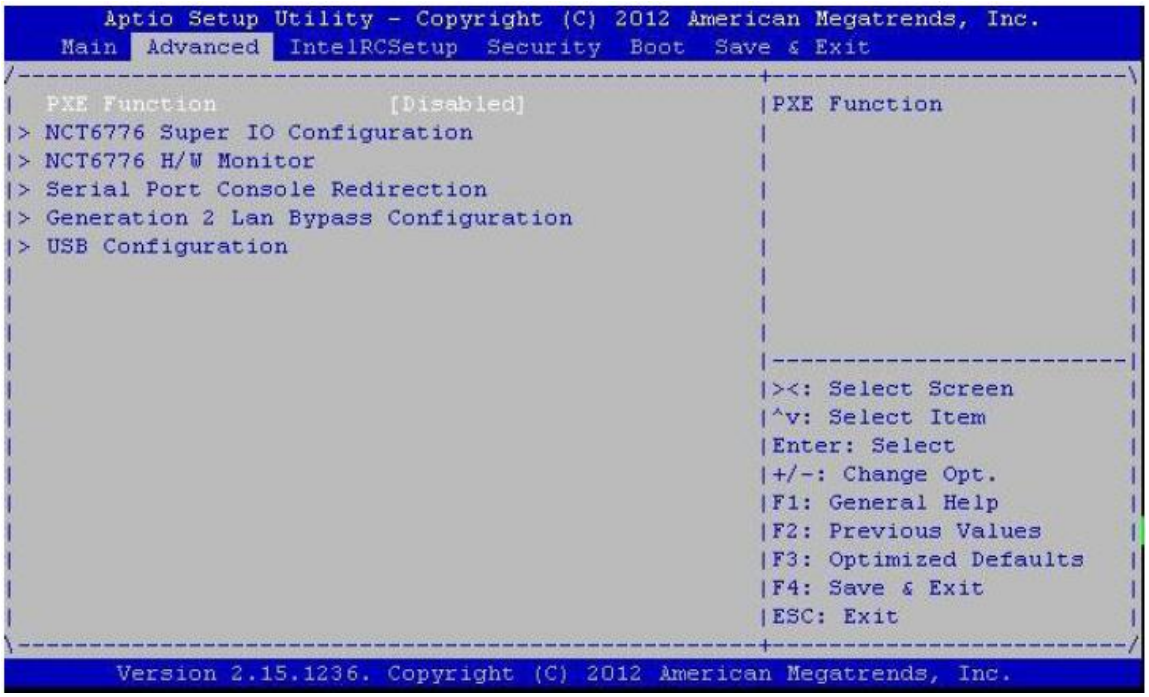


(The screenshots presented in this section are for reference only)

Item	Description
BIOS Information	● BIOS Vendor: American Megatrends ● Core Version: AMI Kernel version, CRB code base, X64 ● Compliancy: UEFI version, PI version ● Project Version: BIOS release version ● Build Date and Time: MM/DD/YYYY ● Access Level: Administrator / User
System Language	English
System Date	To set the Date, use **<Tab>** to switch between Date elements. ●]Default Range of Year: 2005-2099 ● Default Range of Month: 1-12 ● Days: dependent on Month.
System Time	To set the Date, use **<Tab>** to switch between Date elements.

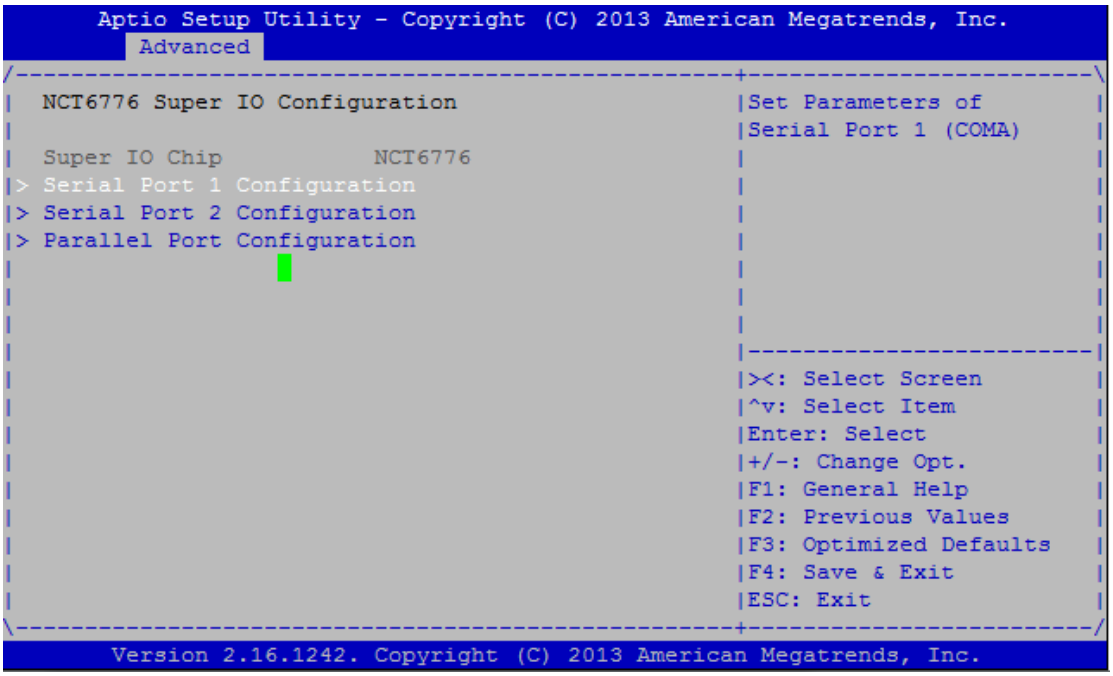
Advanced

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the submenu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown at the right. The submenus are described on the following pages.

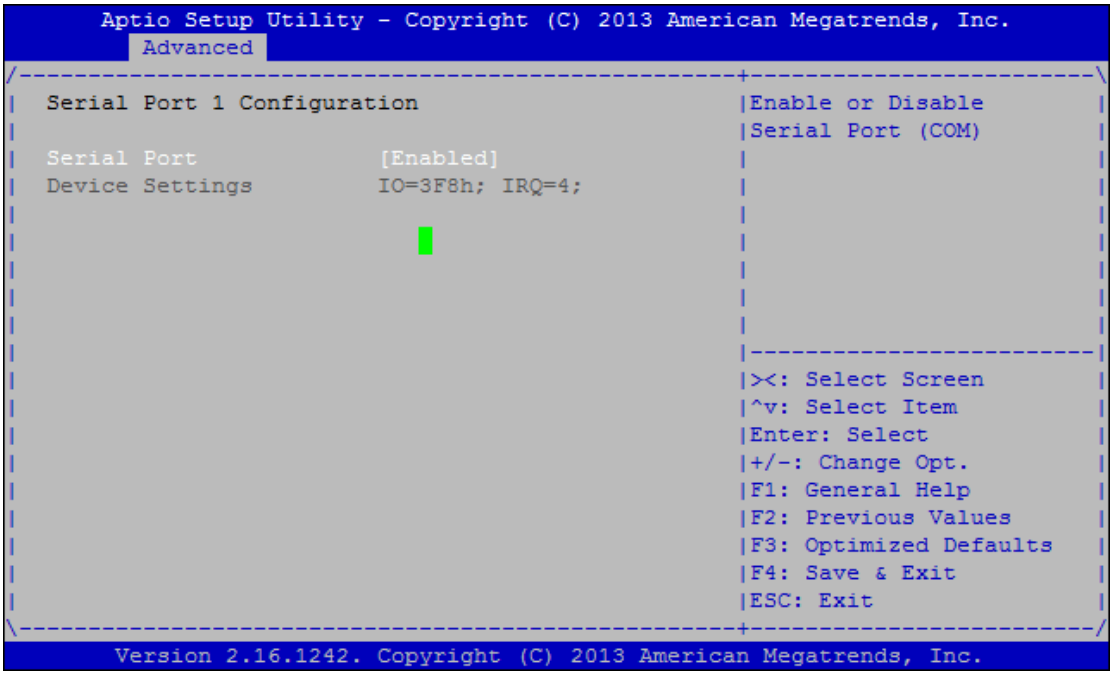


Feature	Options	Description
PXE Function	Enabled Disabled	PXE Function

NCT6776 Super IO configuration

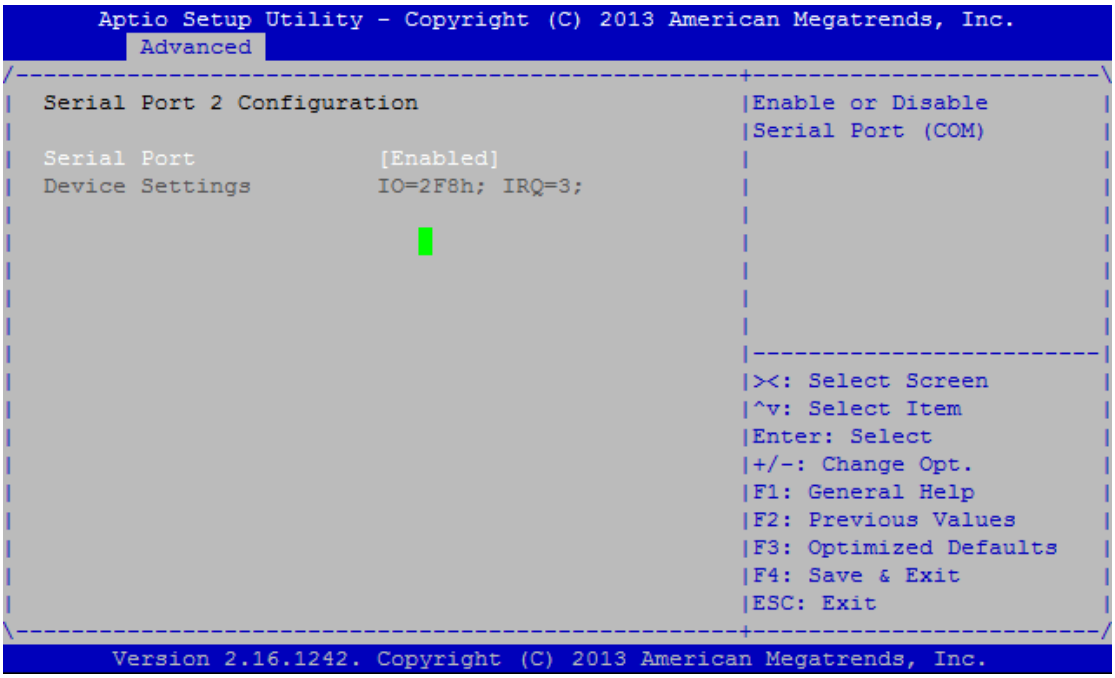


Serial Port1 Configuration



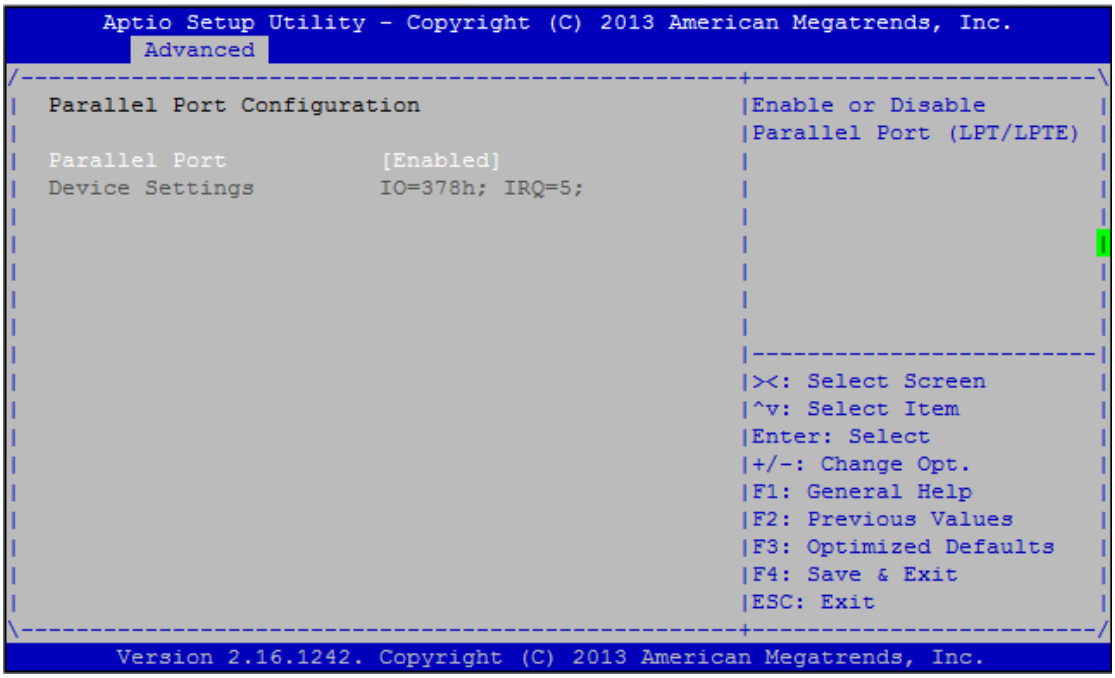
Feature	Options	Description
Serial Port	Enabled Disabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO=3F8h; IRQ = 4

Serial Port2 Configuration



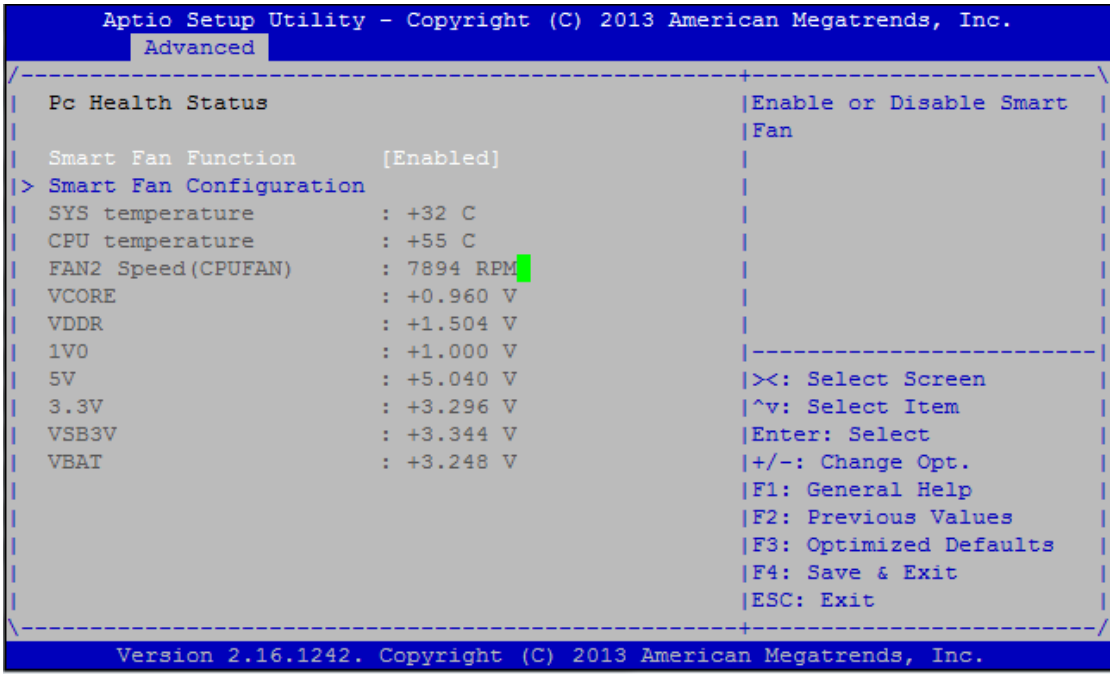
Feature	Options	Description
Serial Port	Enabled Disabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO=2F8h; IRQ = 3

Parallel port Configuration



Feature	Options	Description
Serial Port	Enabled Disabled	Enable or Disable Parallel Port (LPT/LPTE)
Device Settings	NA	IO=378h; IRQ = 5

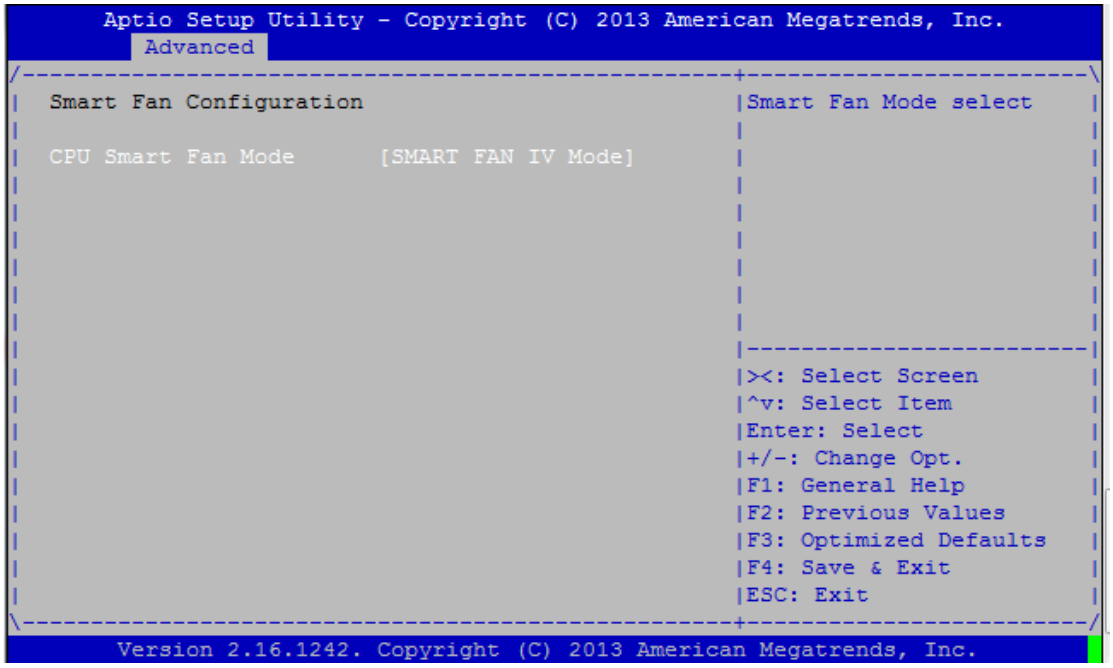
NCT6776 HW Monitor



Feature	Options	Description
Smart Fan Function	Enabled Disabled	Enable or Disable Smart Fan

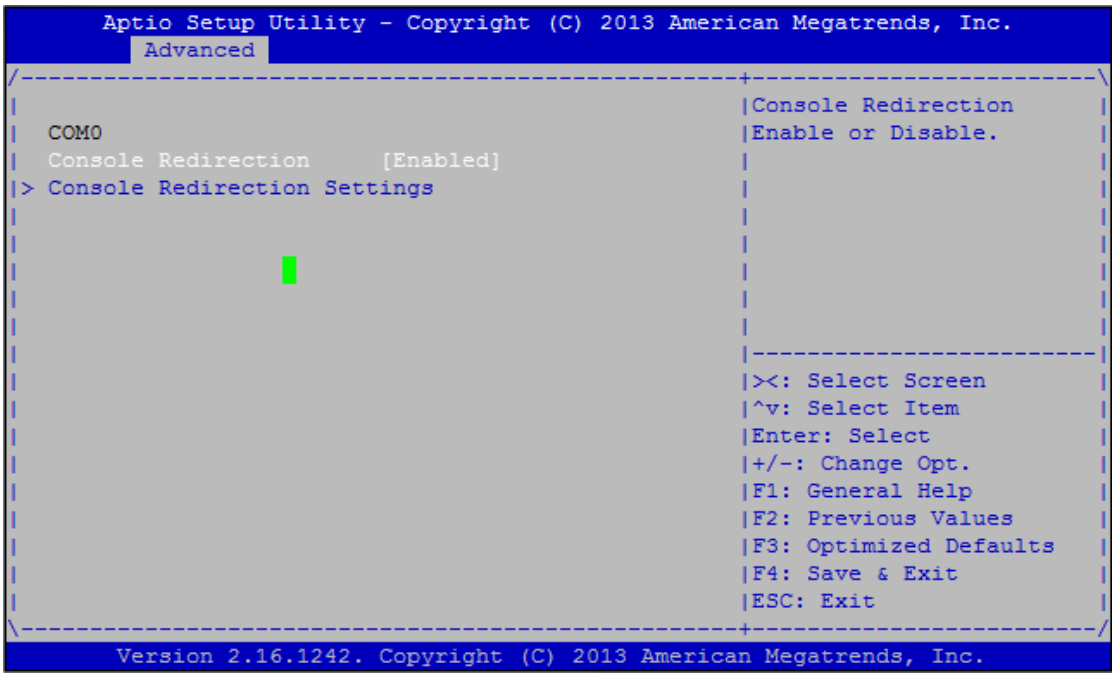
Smart Fan Mode Configuration

It allows you to configure the smart fan feature. You can manually turn on the CPU fan or set the target CPU temperature at which the CPU fan will start running if the fan is not yet turned on. And the CPU fan can also be turned off automatically if the temperature for the CPU is at or below the specified value.



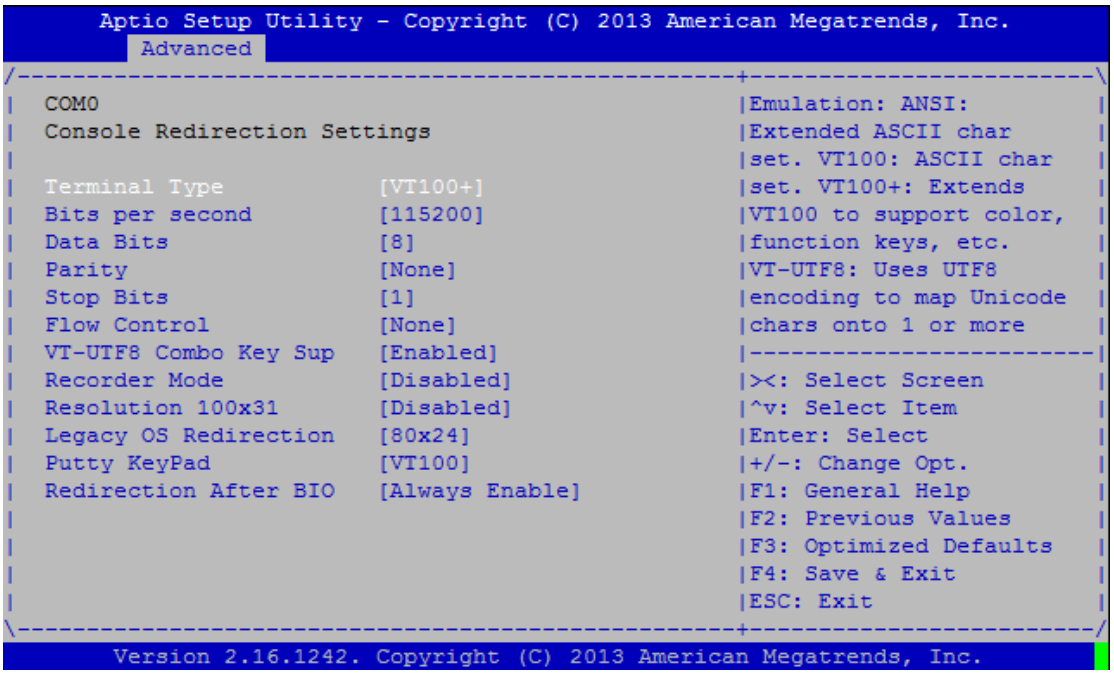
Feature	Options	Description
CPU Smart Fan Mode	Full Speed SMART FAN IV Mode	Smart Fan Mode select

Serial Port Console Redirection



Feature	Options	Description
COM0 Console Redirection	Enabled Disabled	Enables or disables Console Redirection

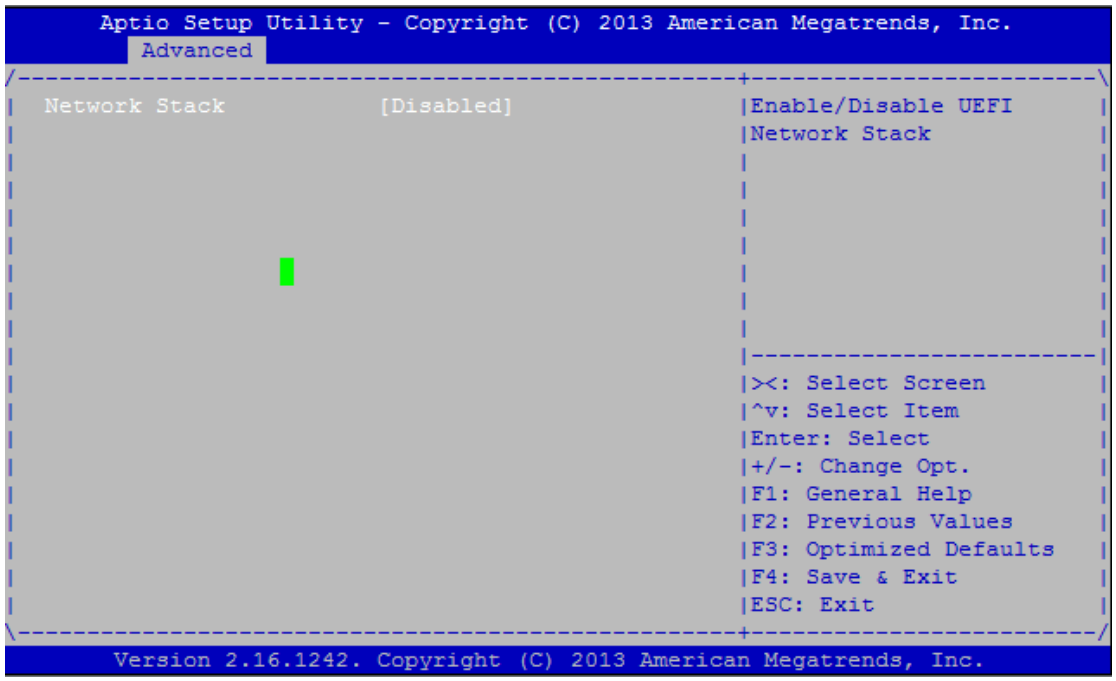
Console Redirection Settings



Feature	Options	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	**VT100**: ASCII char set **VT100+**:Extends VT100 to support color, function keys, etc. **VT-UTF8**:Uses UTF8 encoding to map Unicode chars onto 1 or more bytes **ANSI**: Extended ASCII char set
Bits per second	9600 19200 38400 57600 115200	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	7 8	Data Bits
Parity	None Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors.
Stop Bits	1 2	Indicates the end of a serial data packet.
Flow Control	None Hardware RTS/CTS	Flow Control can prevent data loss from buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals

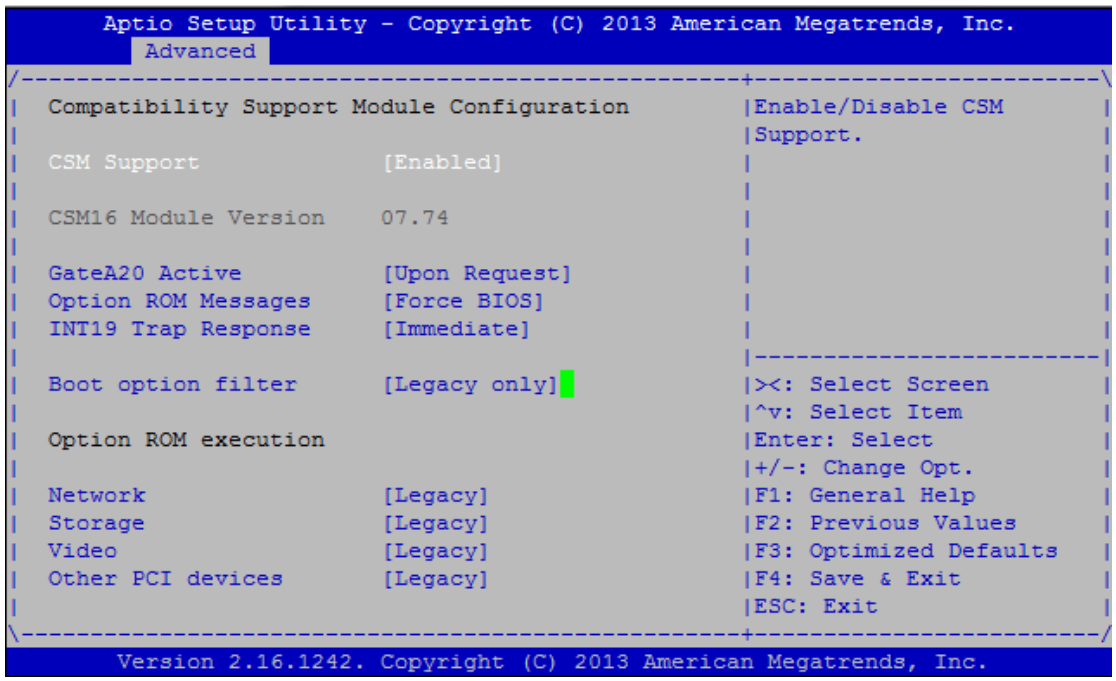
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Legacy OS Redirection Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects FunctionKey and KeyPad on Putty.
Redirection After BIOS POST	Always Enable BootLoader	The Settings specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legaacy console Redirection is enabled for Legacy OS.

Network Stack Configuration



Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack
Ipv4 PXE Support	Disabled Enabled	Enables Ipv4 PXE Boot Support. If IPV4 is disabled, PXE boot option will not be created.
Ipv6 PXE Support	Disabled Enabled	Enables Ipv6 PXE Boot Support. If IPV6 is disabled, PXE boot option will not be created.
PXE boot wait time	0	Wait time to press **<ESC>** key to abort the PXE boot

CSM Configuration

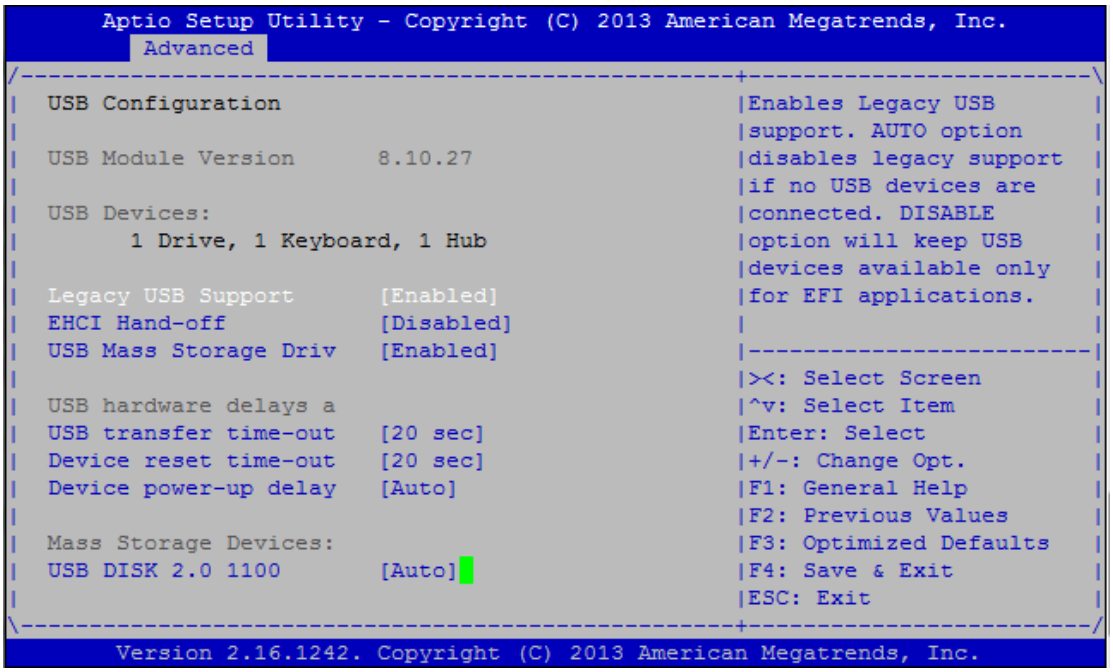


Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
GateA20 Active	Upon Request Always	UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS Keep Current	Set display mode for Option ROM
INT19 Trap Response	Immediate Postponed	BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.
Boot option filter	UEFI and Legacy Legacy only UEFI only	This option controls Legacy/UEFI ROMs priority
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch	Controls the execution of UEFI and Legacy

	UEFI Legacy	Video OpROM
Other PCI device	Do Not Launch UEFI Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

USB Configuration

You can use this screen to select options for the USB Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages.

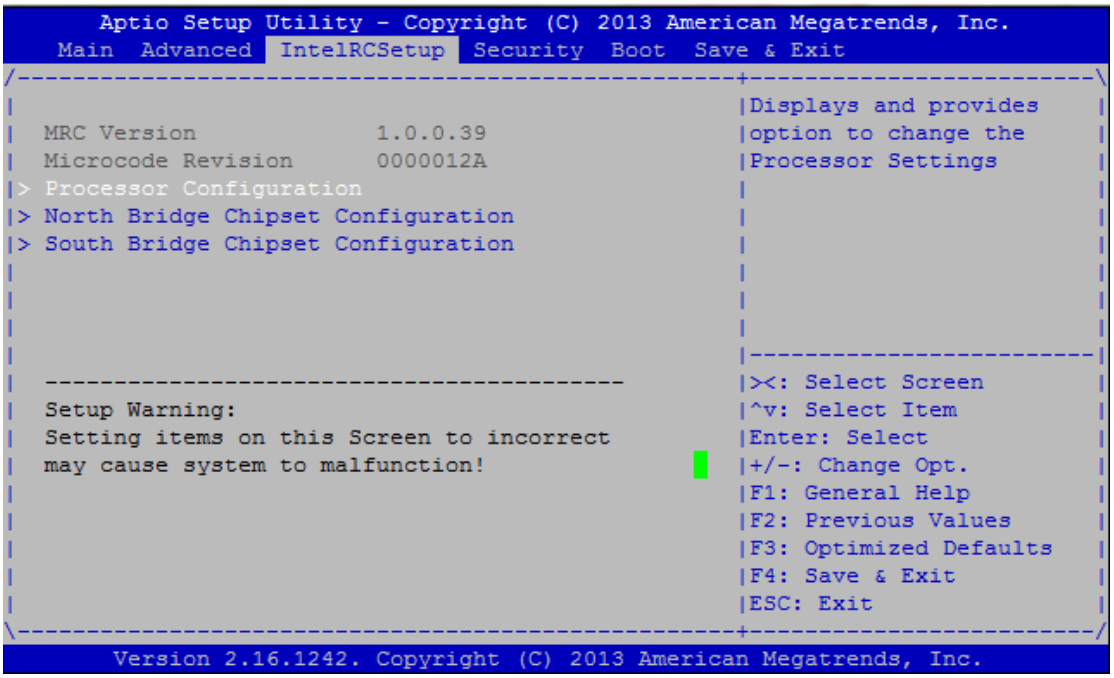


Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected; **Disabled** option will keep USB devices available only for EFI applications.
EHCI Hand-off	Enabled Disabled	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
USB Mass Storage Driver Support	Enabled Disabled	Enables or disables USB Mass Storage Driver Support.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out

Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

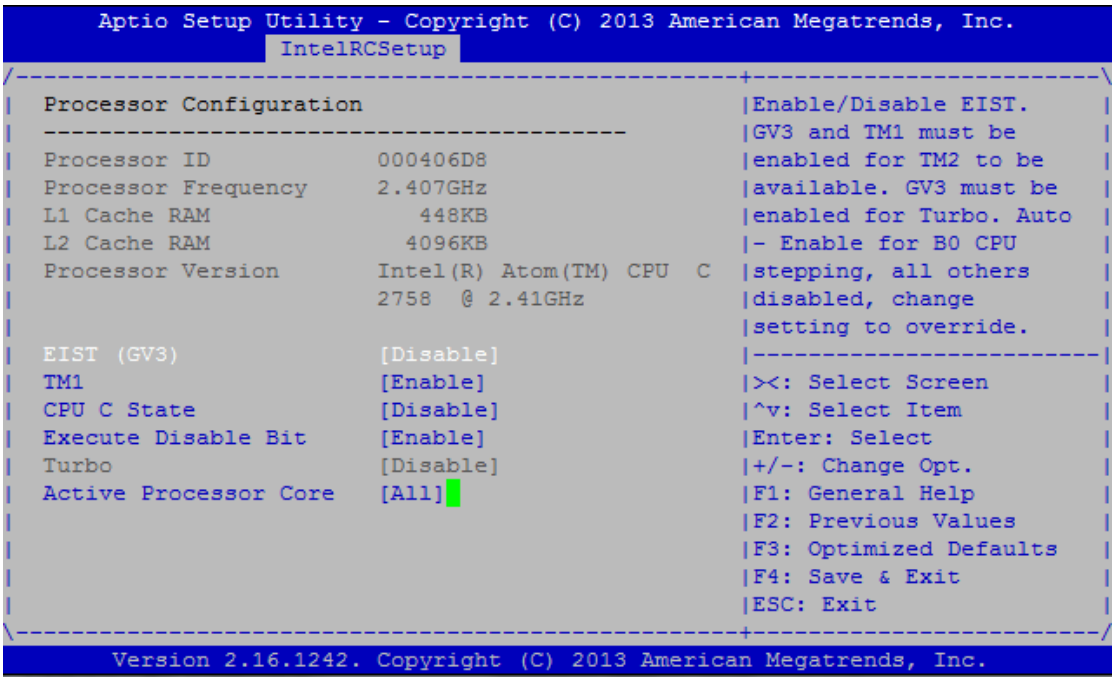
Intel RCSetup

You can use this screen to view the capabilities and of your CPU. You can also use this menu to enable/disable certain functions of your CPU. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described below.



Feature	Options	Description
Processor Configuration	None	Displays and provides option to change the Processor Settings
North Bridge Chipset Configuration	None	North Bridge Chipset Configuration
South Bridge Chipset Configuration	None	South Bridge Chipset Configuration

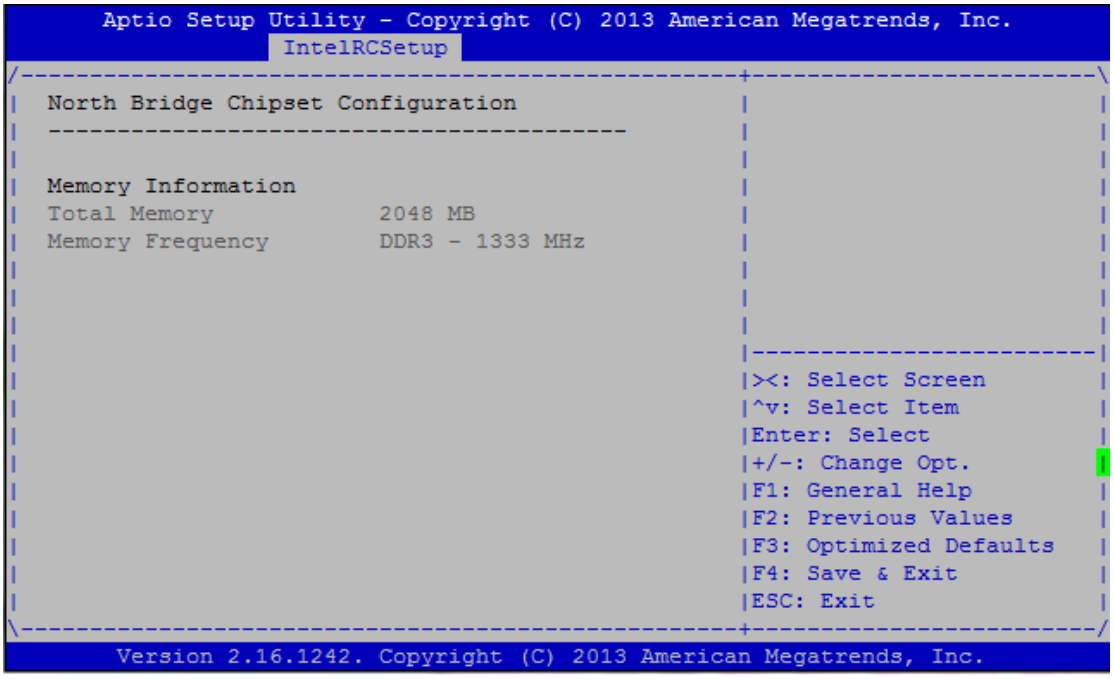
Processor Configuration

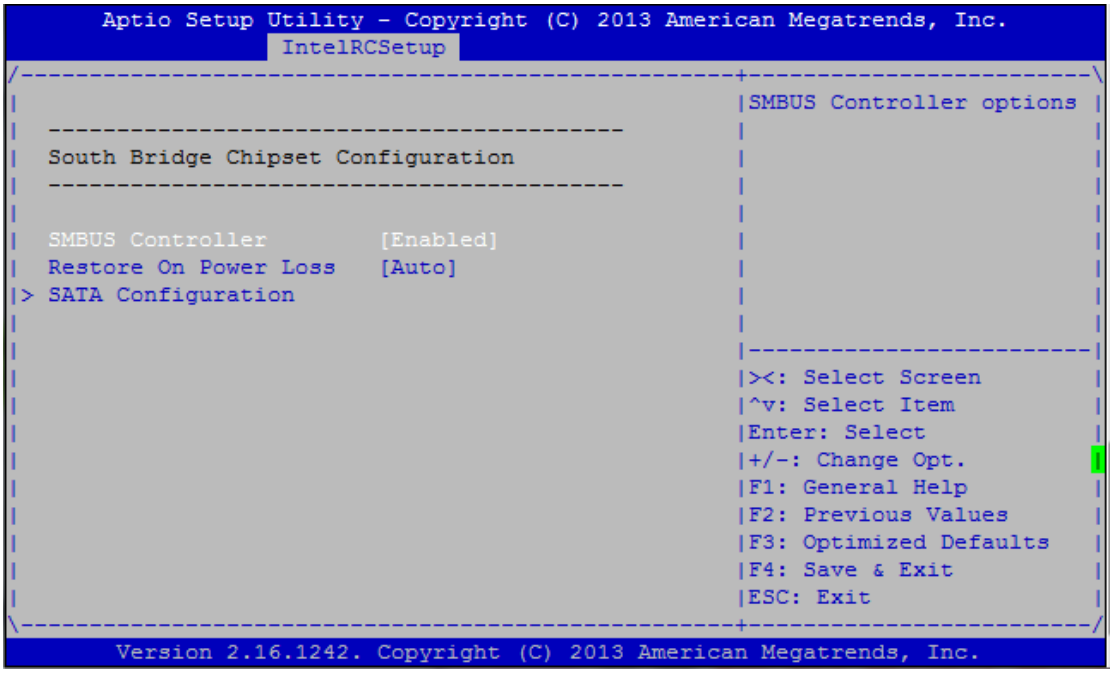


Feature	Options	Description
EIST (GV3)	Disabled Enabled Auto	Enable/Disable EIST. GV3 and TM1 must be enabled for TM2 to be available. GV3 must be enabled for Turbo. Auto - Enable for B0 CPU stepping, all others disabled, change setting to override.
TM1	Disabled Enabled	Enable/Disable TM1. TM1 and GV3 must be enabled in order to support TM2
CPU C State	Disabled Enabled Auto	Enables the Enhanced Cx state of the CPU, takes effect after reboot. Auto - Enable for B0 CPU stepping, all others disabled, change setting to override.
Execute Disable Bit	Disabled Enabled	When disabled, forces the XD feature flag to always return 0.
Turbo	Disabled Enabled	Enable or Disable CPU Turbo capability. This option only applies to ES2 and above.
Active Processor Cores	ALL 4 2	Number of cores to enable in SoC package.

North/South Bridge

The chipset menu will let you further configure your Intel CPU and PCH capabilities:

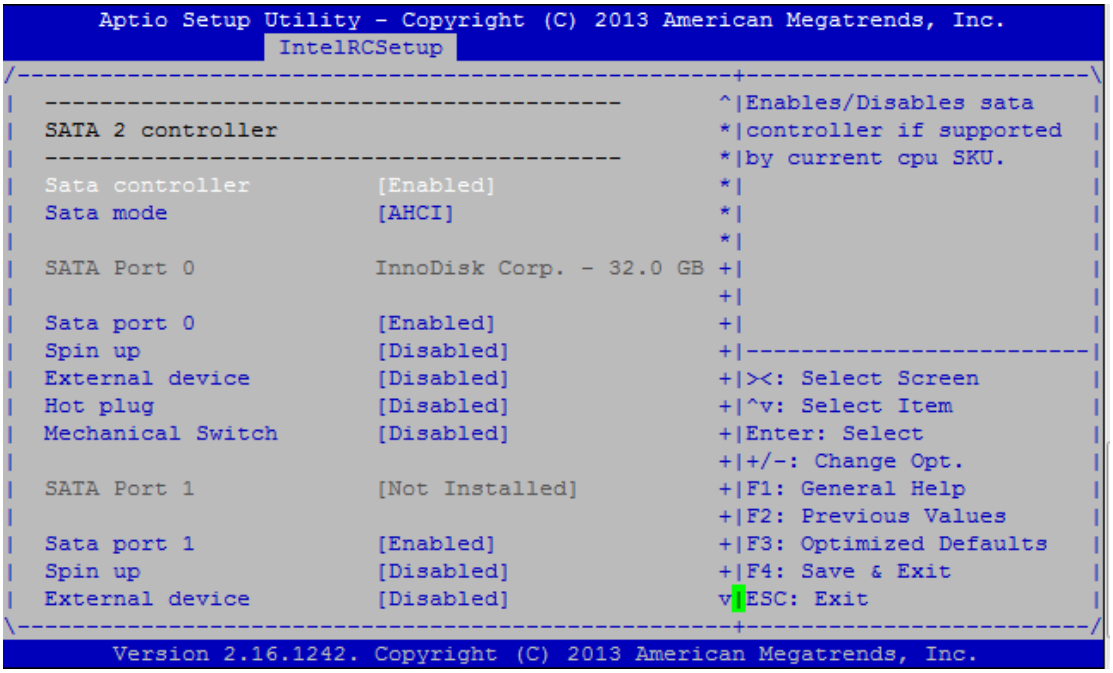




Feature	Options	Description
SMBUS Controller	Enabled Disabled	SMBUS Controller options
Restore On Power Loss	Auto Power On Power Off	Restore On AC Power Loss Options

SATA Controllers Configuration Settings

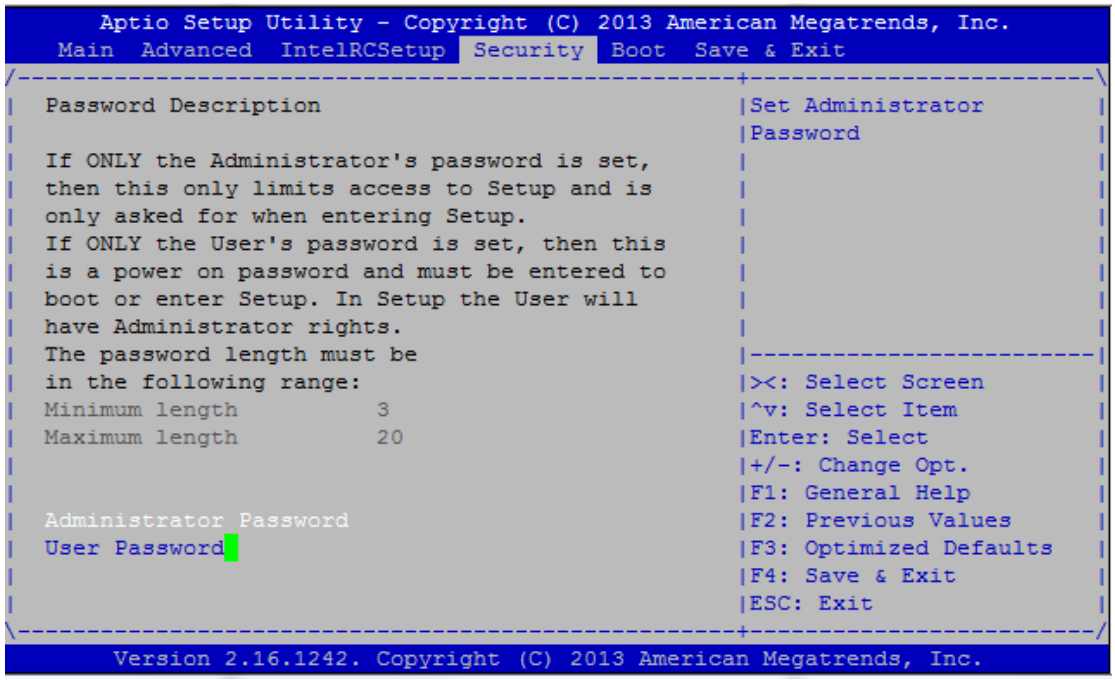
While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show "Not Installed" if no SATA device is installed to the corresponding SATA port.



Feature	Options	Description
SATA controller	Enabled Disabled	Enables/Disables sata controller if supported by current cpu SKU.
Sata mode	IDE AHCI	Sata mode
Sata port 0/1/2/3/4/5	Enabled Disabled	Enables/Disables sata device if supported by current cpu SKU.
Spin up	Enabled Disabled	Spin up
External device	Enabled Disabled	External SATA device
Hot plug	Enabled Disabled	Hot plug
Mechanical Switch	Enabled Disabled	Mechanical Switch

Security Settings

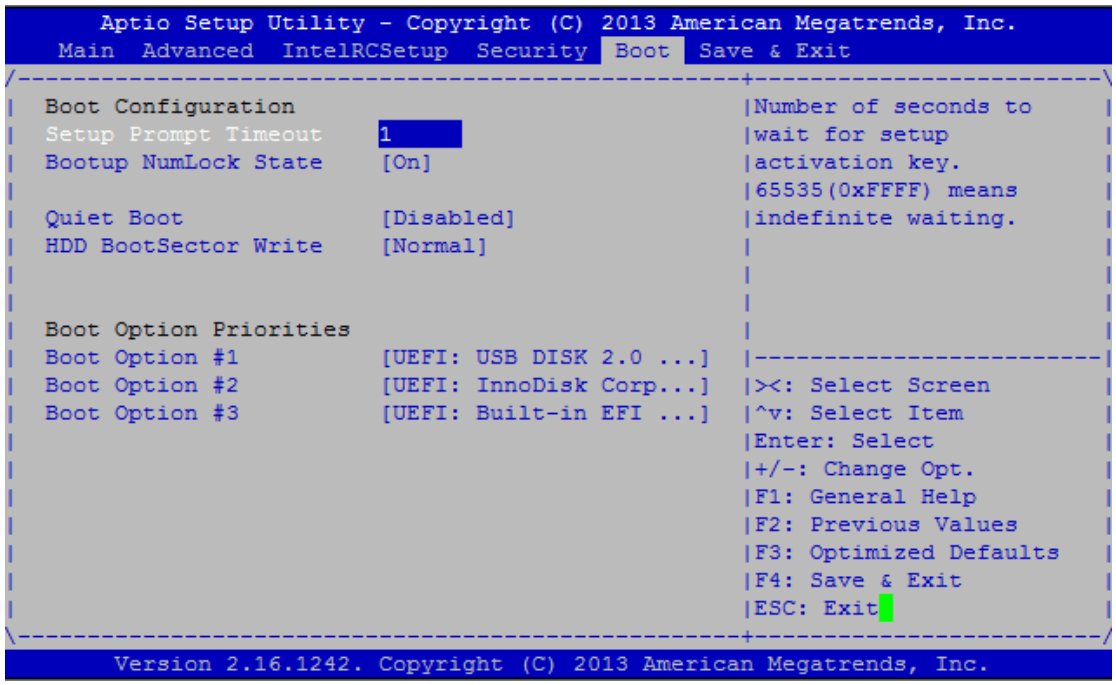
Select Security Setup from the Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection, are described in this section. To access the sub menu for the following items, select the item and press <Enter>:



Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the User will have Administrator rights.

Boot Configuration

In this screen, you will be able to configure the boot procedures and the related elements.

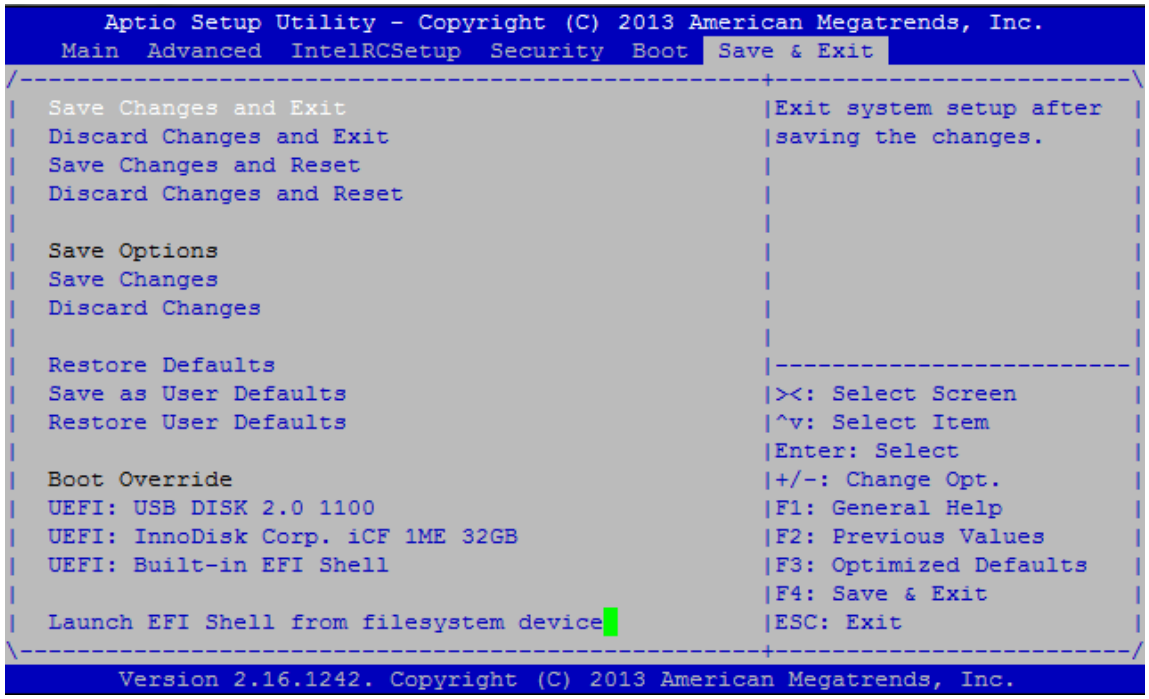


Feature	Options	Description
Setup Prompt Timeout	1	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.
HDD BootSector Write	Normal Write Protect	Enables or disables writes to Hard Disk Sector 0

- Choose boot priority from boot option group.

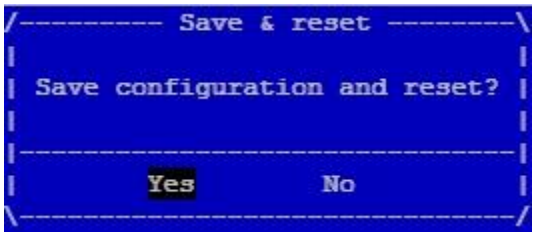
Save and Exit

Select the Save and Exit menu item from the BIOS setup screen to enter the Save and Exit Setup screen. Users can select any of the items in the left frame of the screen.



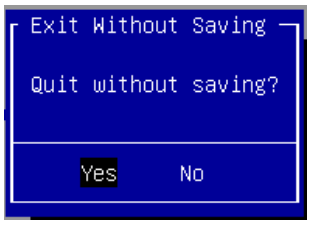
■ Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and exit from BIOS Setup in order for the new system configuration parameters to take effect. The following window will appear after selecting the "**Save Changes and Exit**" option is selected. Select "**Yes**" to Save Changes and Exit Setup.



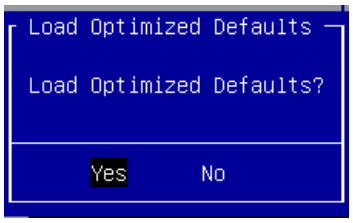
■ Discard Changes and Exit

Select this option to quit Setup without saving any modifications to the system configuration. The following window will appear after the "**Discard Changes and Exit**" option is selected. Select "**Yes"** to Discard changes and Exit Setup.



■ Restore Defaults

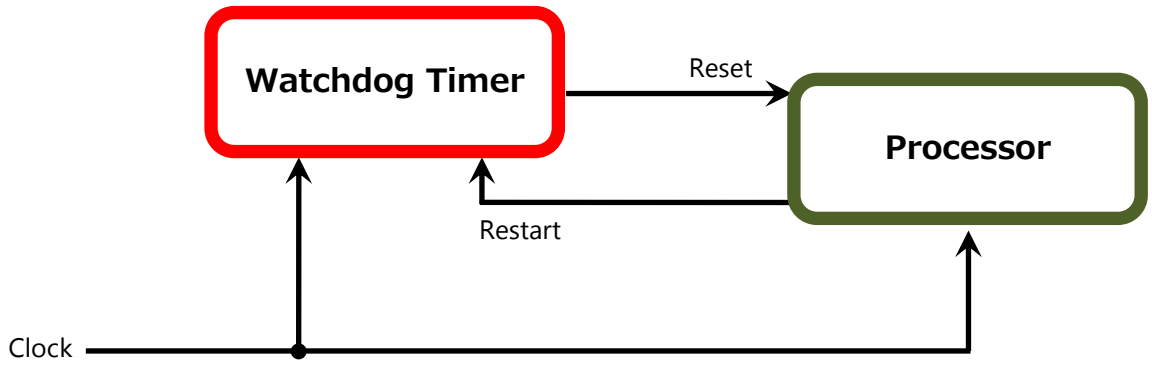
Restore default values for all setup options. Select "**Yes"** to load Optimized defaults.



PS: The items under Boot Override should on devices connected to this system.

APPENDIX A: PROGRAMMING WATCHDOG TIMER

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is resumed to be malfunctioning and watchdog timer expired. One of two expected events could be selected by software: One is processor reset (i.e., system reset), the other is Gen2 LAN bypass activated. In the first case, the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power. In the other case, LAN bypass is activated immediately through watchdog timer circuits. Keep in mind that in the latest case, system is not reset, but Gen2 LAN bypass activated. See Appendix. B to learn more how to configure the system to act like reset or LAN-bypass while watchdog timer expired.



To execute the sample code: enter the number of seconds to start the countdown before the system can be reset. Press start to start the counter and stop to stop the counter.

```
wd_tst --swt xxx (Set Watchdog Timer 1-255 seconds)
wd_tst[*] --start (Start Watchdog Timer)
wd_tst --stop (Stop Watchdog Timer)
```

For sample Watchdog code, please download the ZIP file "FW 7573 7571 drivers" from http://www.lannerinc.com/category/1197-network-appliances, and "Lanner Bypass Watchdog module-user guide" from http://www.lannerinc.com/category/1202-network-appliances

APPENDIX B: PROGRAMMING GENERATION 2 AND 3 LAN BYPASS

Lanner Generation 3 Bypass

The bypass function is used to link two independent Ethernet ports when the system crashes or powers off. This means if your system is equipped with a LAN Bypass function, a condition in your system will not interrupt your network traffic. Different from the previous two generations (Gen1 and Gen2), the Lanner Bypass Gen 3 employs a programming method to control the bypass function by software. There are typically two communication statuses for the bypass function; one is "Normal', and another is "Bypass" status. Furthermore, the Lanner Bypass software is capable of controlling the bypass status in the following 3 states:

1. When the system powers off, it can be forced to enable the LAN Bypass function .
2. When the system is in the just-on state which is a brief moment when it powers up .
3. When the system is running

And the Lanner bypass possesses the following features:

1. Communication through SMBUS (I2C)
2. Independent bypass status control for each pair up to a total of 4 pairs
3. Lanner Bypass Modules can bypass systems Ethernet ports on a host system during three instances: Just-on (Just-on is the brief moment when the internal power supply turns on and booting process starts), system off, or upon software request (during run-time).
4. Software programmable bypass or normal mode
5. Software programmable timer interval:
   - JUST-ON watchdog timer, used during JUST-ON, has timer setting of 5~1275 seconds of timer interval.
   - Run-Time watchdog timer, used during run-time, has setting of 1~255 seconds of timer interval.
6. Multiple Watchdog Timers:
   -Two for run-time: It is designed to give you a more variety of controls of the bypass on a port basis. By using dedicated watchdogs for different pairs of bypass, you have the flexibility to manage the bypass status for them differently.
   -One for just-on: It is designed to give you the precise control of the bypass during this phase. You can use this timer to delay enabling the bypass in just-on state.

For sample LAN bypass code, please download the ZIP file "FW 7573 7571 drivers" from http://www.lannerinc.com/category/1197-network-appliances, and "Lanner Bypass Watchdog module-user guide" from http://www.lannerinc.com/category/1202-network-appliances

Lanner Generation 2 Bypass

Unlike Lanner Generation 3 bypass, Generation 2 bypass is configured through the BIOS menu as described in *Lanner Generation 2 LAN Bypass Configuration* in ***Chapter 4 BIOS Settings***.

1. The LAN bypass can be turned on or off in two system states, i.e., power on and power off. The following are the illustration of the possibilities of LAN bypass configuration with respect to both power-on and power-off states.

2. A watchdog timer can be used to control the LAN Bypass function dynamically by programming. Lanner also provides sample code for bypass control with WDT via programming.

wd_tst --srbe [1|2](Set Pair 1/2 Runtime Bypass Enabled)
wd_tst --srbd [1|2](Set Pair 1/2 Runtime Bypass Disabled)
wd_tst --sobe [1|2](Set Pair 1/2 Off-mode Bypass Enabled)
wd_tst --sobd [1|2](Set Pair 1/2 Off-mode Bypass Disabled)
wd_tst --swtsb (Set Watchdog Timeout State to Bypass)
wd_tst --swtsr (Set Watchdog Timeout State to Reset)
wd_tst --swt xxx (Set Watchdog Timer 1-255 seconds)

Note: For the description of the physical LAN ports equipped with LAN bypass functionality, refer to Front Panel Features in Chapter 1 Introduction.

APPENDIX C: SETTING UP CONSOLE REDIRECTIONS

Console redirection lets you monitor and configure a system from a remote terminal computer by re-directing keyboard input and text output through the serial port. These following steps illustrate how to use this feature. The BIOS of the system allows the redirection of console I/O to a serial port. With this configured, you can remotely access the entire boot sequence through a console port.

1. Connect one end of the console cable to console port of the system and the other end to serial port of the Remote Client System.
2. Configure the following settings in the BIOS Setup menu:
   BIOS > **Advanced** > **Serial Port Console Redirection** >**Console Redirection Settings** > **[115200, 8 , None,1]**
3. Configure Console Redirection on the client system. The following illustration is an example on Windows platform:
   - ***A.*** Click the start button, point to **Programs** > **Accessories** > **Communications** and select **Hyper Terminal**.
   - ***B.*** Enter any name for the new connection and select any icon.
   - ***C.*** Click **OK**.
   - ***D.*** From the "**Connect to**." Pull-down menu, select the appropriate Com port on the client system and click **OK**.
   - ***E.*** Select 115200 for the Baud Rate, None. for Flow control, 8 for the Data Bit, None for Parity Check, and 1 for the Stop Bit.

APPENDIX D: PROGRAMMING THE LCM

The LCD panel module (LCM) is designed to provide real-time operating status and configuration information for the system. For sample LCM code, please download the ZIP file "FW 7573 7571 drivers" from http://www.lannerinc.com/category/1197-network-appliances, and "LCM user guide" from http://www.lannerinc.com/category/1202-network-appliances.

The system supports the following types of LCM:

- Parallel Text-based LCM: The LCM connects to the motherboard's parallel port. The LCD screen can display 2 lines, 20 characters per line.
- Parallel Graphics-based LCM: The LCM connects to the motherboard's parallel port. The LCD screen can display 128x64x1 bit matrix

APPENDIX E: INSTALLING INTEL QUICKASSIST SOFTWARE FOR LINUX

The FW-7573 platform incorporates Intel QuickAssist Technology, which includes acceleration modules that are accessed via Intel QuickAssist software. The Intel quickAssist software also enables the acceleration modules to be easily accessed by open source software such as OpenSSL. The Intel QuickAssist Technology features the acceleration to the following crypto functions:

- Symmetric Cryptographic Functions

– Cipher Operations
– Hash/Authenticate Operation
– Cipher-Hash Combined Operation
– Key Derivation Operation

- Public Key Functions

– RSA Operation
– Diffie-Helman Operation
– Digital Signature Standard Operation
– Key Derivation Operation
– Elliptic Curve Cryptography: ECDSA* and ECDH*

You can find Intel® QAT software and collaterals from https://01.org/zh/intel-quickassist-technology?langredirect=1 ,

and the overview of this technology developed by Intel® https://www.intel.com/content/www/us/en/architecture-and-technology/intel-quick-assist-technology-overview.html

APPENDIX F: TERMS AND CONDITIONS

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for the repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
   - Improper or inadequate maintenance by the customer
   - Unauthorized modification, misuse, or reversed engineering of the product
   - Operation outside of the environmental specifications for the product.

RMA Service

Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form " to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:	Reasons to Return: ▫ Repair(Please include failure details) ▫ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____	
Shipping by: ▫ Air Freight ▫ Sea ▫ Express_____ ▫ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
	09: Cache RMA Problem	15: PS2	21: Shut Down
03: CMOS Data Lost	10: Memory Socket Bad	16: LAN	22: Panel Fail
04: FDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
05: HDC Fail	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)
06: Bad Slot			

Request Party

Authorized Signature / Date

Confirmed By Supplier

Authorized Signature / Date