NEXCOM International Co., Ltd.

Industrial Computing Solutions

Fan-less Computer

nTUF 600

User Manual

NEXCOM International Co., Ltd.
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Preface

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Regulatory Compliance Statements

This section provides the FCC compliance statement for Class B devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class B digital device, pursuant to Part 15 of 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 instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

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RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

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Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

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Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

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Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

15. Do not place heavy objects on the equipment.

16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

17. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

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Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

Conventions Used in this Manual

Warning:
Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

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Package Contents

Before continuing, verify that the nTUF 600 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Description	Qty
1	602DCD0477X00	(N)nTUF600 DVD DRIVER VER:1.0	1
2	60177A0263X00	(N)nROB600 QUICK REFERENCE GUIDE VER:A	1
3	5060900226X00	MINI PCIe BRACKET CHYUAN-JYH	1
4	50311F0295X00	FLAT HEAD SCREW LONG FEI:F2x4 NYLOK NIGP	2
5	50311F0294X00	I HEAD SCREW LONG FEI:I2x4 NYLOK NIGP	2
6	50311F0110X00	(H)FLAT HEAD SCREW LONG FEI:F3x5ISO+NYLOK NIGP	8
7	4NCPM00302X00	(T)TERMINAL BLOCKS 3P PHOENIX CONTACT:1777992	1
8	4NCPF00806X00	TERMINAL BLOCKS 8P PHOENIX CONTACT:1803633	1
9	4NCPF00611X00	TERMINAL BLOCKS 6P PHOENIX CONTACT:1803617	1
10	4NCPF00512X00	TERMINAL BLOCKS 5P PHOENIX CONTACT:1803604	4

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Ordering Information

The following information below provides ordering information for nTUF 600 series.

- **Barebone**

nTUF 600 (P/N: 10M00060000X2)
- Intel® Atom™ Dual Core D525 1.8GHz Fanless Marine Computer

nTUF 605 (P/N: 10M00060500X0)
- Intel® Atom™ Dual Core D525 1.8GHz Marine Computer with DVD Combo

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Chapter 1: Product Introduction

Overview

Key Features

- On-board Intel® Atom™ Dual Core D525 processor, 1.8 GHz
- 4x USB ports
- Dual M12 connector for Intel® 82574L GbE LAN ports
- 1x VGA display output
- 2x RS232
- 2x PS/2 for keyboard and mouse
- 1x external CFast socket
- 1x mini-PCIe with two Antenna Holes
- Support +24V DC power input
- Dual cold swappable 2.5" SSD tray
- Supports ATX Power Mode, WoL, LAN Teaming and PXE function

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Hardware Specifications

CPU Support

- On-board Intel® Atom™ Dual Core processor D525, 1.8 GHz, 1M cache
- Intel® ICH8M PCHs chipset

Main Memory

- 1x DDR2 SO-DIMM sockets, support up to 2 GB DDR2 667/ 800 SDRAM, un-buffered and non-ECC

I/O Interface-Front

- ATX power on/off switch
- HDD access/ power status LEDs
- LAN1 & LAN2 status LEDs
- 4x USB2.0 ports
- 2x M12 GbE LAN ports
  Intel® 82574L GbE LAN controller on board with1.5KV surge protection
- 1x VGA output
- 1x DVI-D & 1x HDMI (only work when optional MXM 3.0 graphic module is installed)
- Audio jack (speaker-out & Mic-in & Line-in)
- 2x antenna holes
- 2x DB9, RS232
- 2x PS/2 for keyboard & mouse
- 2x cold swappable 2.5" HDD tray
- 1x external screwed type CFast socket
- 3-pin +24V DC input
- 1x external fuse;10A

I/O Interface-Rear

- 4x Digital Input: 6-pin screw terminals
  Voltage level: 5V, TTL-level
- 4x Digital Output: 8-pin screw terminals
  36V DC with 100mA relay
- 4x NMEA 0183 Interfaces
  Signal: TX / RX signals
  2KV optical isolation protection

Device

- 2x 2.5" SSD driver bay
- 1x external CFast socket
- 1 x mini-PCIe socket
  Default: support optional Wi-Fi module
  Option: support optional 3.5G module

Power Requirements

- DC input range: 16V~30V DC input
- Nominal DC input: +24V DC input with 1.5KV isolation protection
- Pin definition: Positive, Negative and Chassis Ground

Dimensions

- 294mm (W) x 200mm (D) x 100mm (H) (11.6"x 7.9"x 3.94")

Construction

- Aluminum chassis with fanless design

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Environment

- Operating temperature:
  Ambient with air flow: -25°C~55°C
  (Based on IEC60945 4th edition, IACS E10 and DNV 2.4)
- Storage temperature: -30°C ~ 80°C
- Relative humidity: 10% to 93% (non-condensing)

Certifications

- IEC60945
- IACS E10
- DNV 2.4

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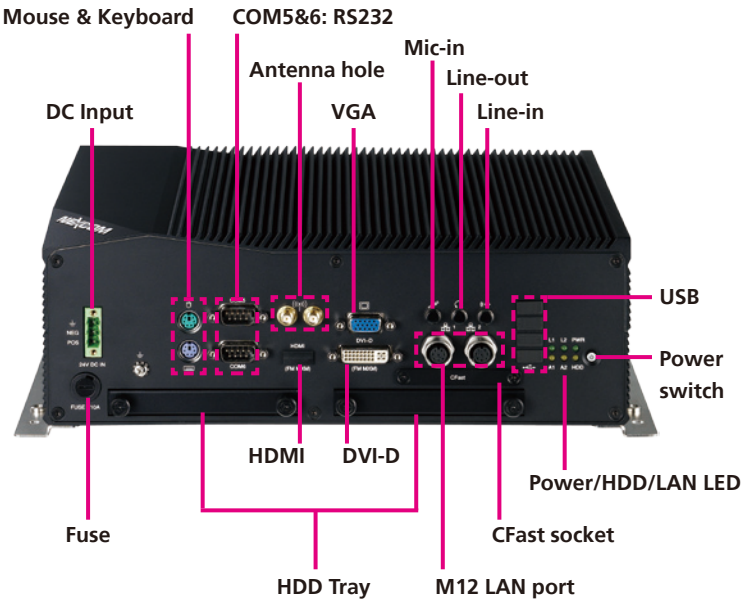
Knowing Your nTUF 600

Front Panel



DC Input

Used to plug a DC power cord.

Mouse & Keyboard

PS/2 connector for mouse and keyboard.

COM 5 & 6 Ports

Used to connect RS232 compatible devices.

Antenna Hole

Used to install external antennas.

VGA

Used to connect an analog VGA monitor.

Mic-in

Mic-in jack to connect microphones.

Line-out

Line-out jack to connect speakers or headphones.

Line-in

Line-in jack for audio input.

USB

4 USB2.0 ports to connect the system with USB2.0/1.1 device.

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Fuse

A 10A fuse used to protect the system from overcurrent.

HDD Tray

Hard drive trays to install hard drives on.

HDMI

Used to connect a high-definition display. HDMI display output is active only when MXM Graphic card is installed. In addition, the air ventilation holes are necessary if MXM graphic card is installed.

DVI-D

Used to connect a digital LCD panel. DVI-D display output is active only when MXM Graphic card is installed. In addition, the air ventilation holes are necessary if MXM graphic card is installed.

M12 LAN Port

Dual M12 LAN ports used to connect the system to a local area network.

CFast Socket

Used to insert a CFast card.

Power/HDD/LAN LED

Indicates the power status, hard drive and LAN activity of the system.

Power Switch

Press to power-on or power-off the system.

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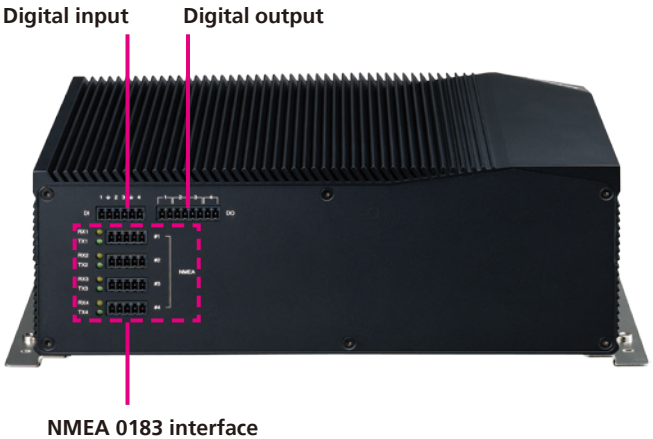
Rear Panel



Digital Input and Output

Four channels of digital input and output used to connect to switches, detectors, lights or alarm triggers.

NMEA 0183 Interface

Four NMEA interfaces used to connect NMEA 0183 RS422 serial devices. (Please set the mode to RS485 in the BIOS menu if RS485 connection is used.)

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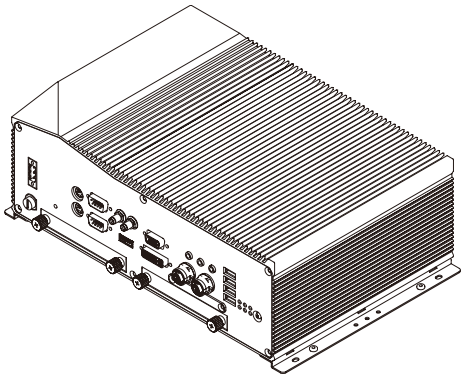
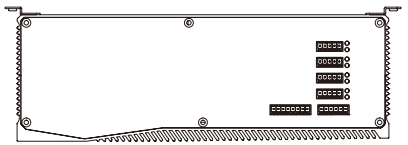
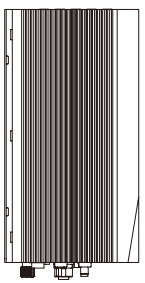
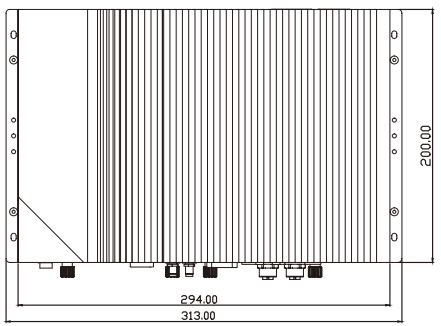
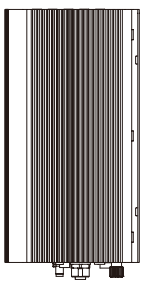
Mechanical Dimensions

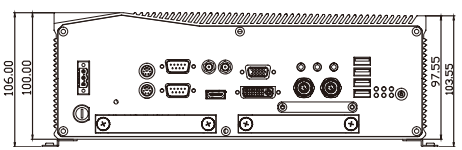












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Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the nTUF 600 motherboard.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

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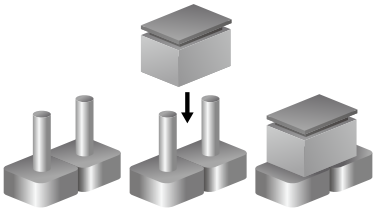
Jumper Settings

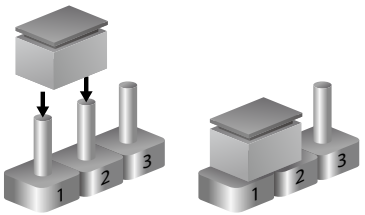
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)



Three-Pin Jumpers: Pins 1 and 2 are Short



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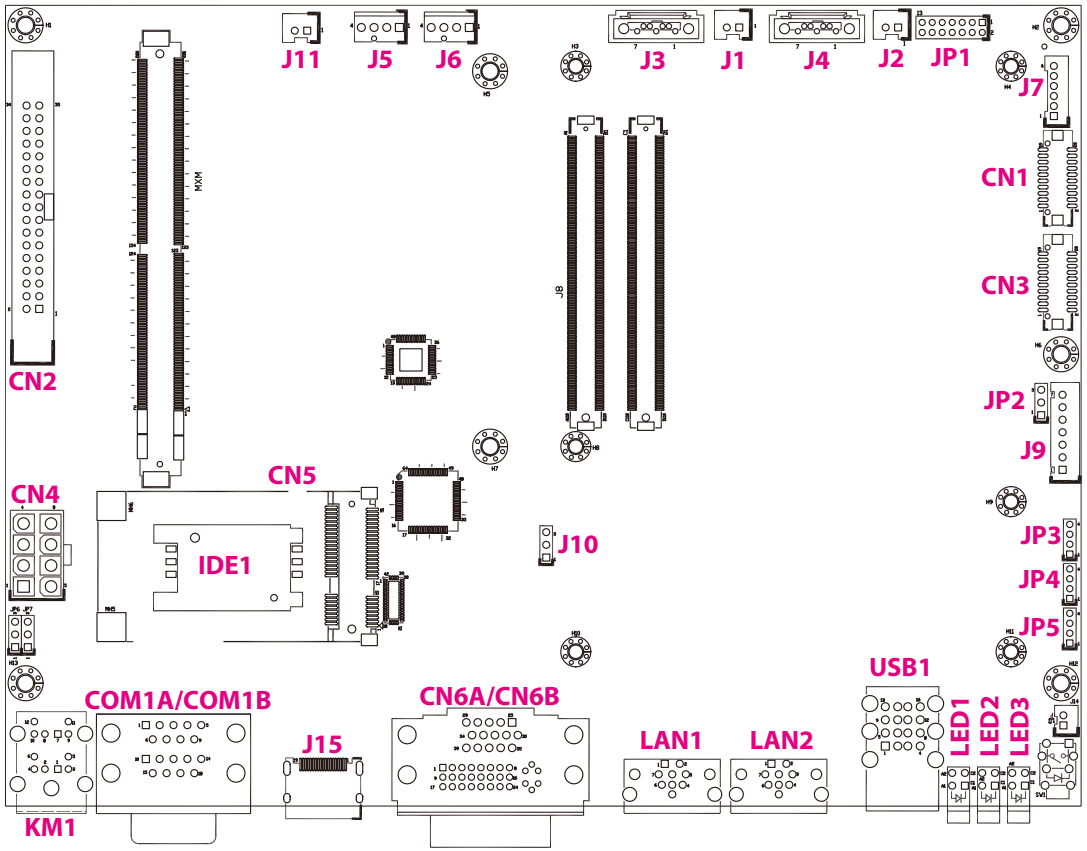
Locations of the Jumpers and Connectors for nROM600

nROB600

The figure below shows the location of the jumpers and connectors.



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Jumpers

RTC Clear

Connector type: 1x3 3-pin header, 2.54mm pitch
Connector location: J10

Pin	Settings
1-2 On	Normal
2-3 On	Clear BIOS

1-2 On: default

Pineview-D LVDS Backlight Power Select

Connector type: 1x3 3-pin header, 2.54mm pitch
Connector location: JP2

Pin	Settings
1-2 On	3.3V
2-3 On	5V

1-2 On: default

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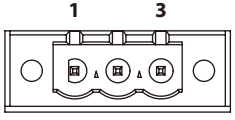
Connector Pin Definitions

External I/O Interfaces - Front Panel

24V DC Input

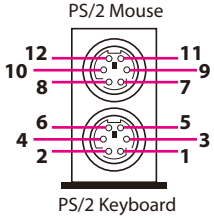
Connector type: 3-pin terminal block



Pin	Definition
1	+
2	-
3	GND

Keyboard and Mouse

Connector type: PS/2, Mini-DIN6
Connector location: KM1



Pin	Definition	Pin	Definition
1	KB DATA	2	NC
3	GND	4	KBMSVCC
5	KBCLK	6	NC
7	MDATA	8	NC
9	GND	10	KBMSVCC
11	MCLK	12	NC

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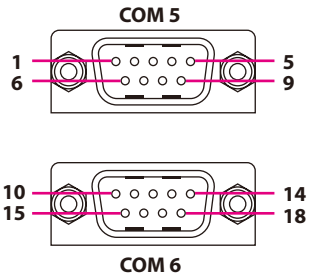
COM 5 and COM 6 Ports

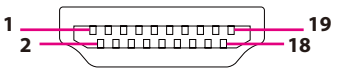
Connector type: DB-9 port, 9-pin D-Sub
Connector location: COM1A, COM1B



Pin	Definition	Pin	Definition
1	SP1_DCD	2	SP1_RXD
3	SP1_TXD	4	SP1_DTR
5	GND	6	SP1_DSR
7	SP1_RTS	8	SP1_CTS
9	SP1_RI	10	SP2_DCD
11	SP2_RXD	12	SP2_TXD
13	SP2_DTR	14	GND
15	SP2_DSR	16	SP2_RTS
17	SP2_CTS	18	SP2_RI

HDMI

Connector type: HDMI port
Connector location: J15



Pin	Definition	Pin	Definition
1	HDMI2_DATA2_P	2	GND
3	HDMI2_DATA2_N	4	HDMI2_DATA1_P
5	GND	6	HDMI2_DATA1_N
7	HDMI2_DATA0_P	8	GND
9	HDMI2_DATA0_N	10	HDMI2_CLK_P
11	GND	12	HDMI2_CLK_N
13	NC	14	NC
15	HDMI2_CTRL_CLK	16	HDMI2_CTRL_DATA
17	GND	18	HDMI2_VCC5
19	HDMI2_HPD_R	20	

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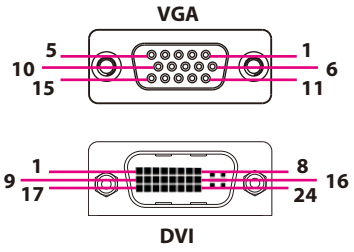
DVI & VGA Connector

Connector type: DB-15 port, 15-pin D-Sub (VGA)
24-pin D-Sub, 2.0mm-M-180 (DVI)
Connector location: CN6A (DVI) and CN6B (VGA)



VGA

Pin	Definition	Pin	Definition
25	RED	26	GREEN
27	BLUE	28	NC
29	GND	30	GND
31	GND	32	GND
33	+5V	34	GND
35	NC	36	DDCDATA_VGA
37	HSYNC_VGA	38	VSYNC_VGA
39	DDCCLK_VGA		

DVI

Pin	Definition	Pin	Definition
1	TX2-	2	TX2+
3	GND	4	NC
5	NC	6	DDC_CLK
7	DDC_DATA	8	NC
9	TX1-	10	TX1+
11	GND	12	NC
13	NC	14	DVI_VCC(+5V)
15	GND	16	HotPlugDet
17	TX0-	18	TX0+
19	GND	20	NC
21	NC	22	NC
23	TXCLK+	24	TXCLK-

Max. Resolution

nTUF	600	605	606
VGA	2048*1536	2048*1536	2048*1536
DVI	X	X	1920*1200
HDMI	X	X	1920*1200

nTUF	610	615	616
VGA	2048*1536	2048*1536	2048*1536
DVI	1920*1200	1920*1200	1920*1200
HDMI	X	X	1920*1200

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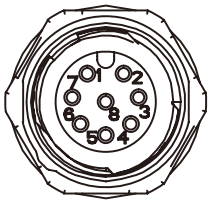
LAN 1 Connector

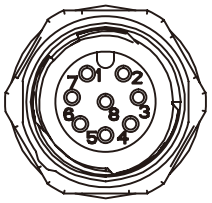
Connector type: M12 port
Connector location: LAN1



Pin	Definition	Pin	Definition
1	LAN1M1P	2	LAN1M3P
3	LAN1M3N	4	LAN1M0N
5	LAN1M2P	6	LAN1M0P
7	LAN1M1N	8	LAN1M2N

LAN 2 Connector

Connector type: M12 port
Connector location: LAN2



Pin	Definition	Pin	Definition
1	LAN2M1P	2	LAN2M3P
3	LAN2M3N	4	LAN2M0N
5	LAN2M2P	6	LAN2M0P
7	LAN2M1N	8	LAN2M2N

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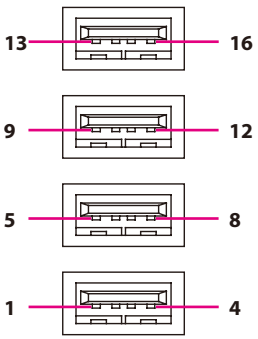
Quadruple USB Port

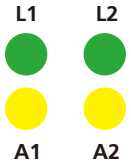
Connector type: Quadruple USB port, Type A
Connector location: USB1



Pin	Definition	Pin	Definition
1	+5V	2	USB_3N
3	USB_3P	4	GND
5	+5V	6	USB2N
7	USN2P	8	GND
9	+5V	10	USB1N
11	USB1P	12	GND
13	+5V	14	USB0N
15	USB0P	16	GND

LAN1/LAN2 Link/Active LEDs

Connector location: LED1 and LED2



Color	Location	LAN1	LAN2	LED status
Green	Top	Link (L1)	Link (L2)	Off: 10M Green: GbE
Yellow	Bottom	Active (A1)	Active (A2)	Blinking: Activity is occurring

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Power LEDs

Connector location: LED3

Status	LED Color
PWR	Green
HDD	Yellow

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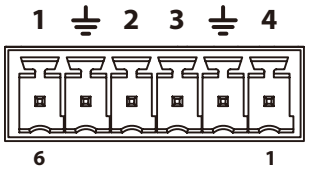
External I/O Interfaces - Rear Panel

Digital Input Connector

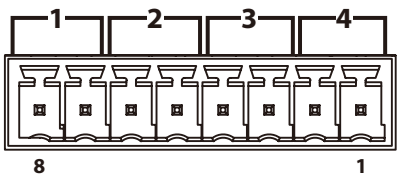
Connector type: 6-pin switch
Connector location: CN1



Pin	Definition
1	GPI3_R
2	GND
3	GPI2_R
4	GPI1_R
5	GND
6	GPI0_R

Digital Output Connector

Connector type: 8-pin switch
Connector location: CN6



Pin	Definition
1	RELAY3_OUT
2	RELAY3_IN
3	RELAY2_OUT
4	RELAY2_IN
5	RELAY1_OUT
6	RELAY1_IN
7	RELAY0_OUT
8	RELAY0_IN

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NMEA Port 1

Connector type: 5-pin switch
Connector location: CN2

Pin	Definition
1	RS422_RX3+
2	RS422_RX3-
3	ISO_GND
4	RS422_TX3+ RS485_D3+
5	RS422_TX3- RS485_D3-

NMEA Port 2

Connector type: 5-pin switch
Connector location: CN3

Pin	Definition
1	RS422_RX4+
2	RS422_RX4-
3	ISO_GND
4	RS422_TX4+ RS485_D4+
5	RS422_TX4- RS485_D4-

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NMEA Port 3

Connector type: 5-pin switch
Connector location: CN4

Pin	Definition
1	RS422_RX5+
2	RS422_RX5-
3	ISO_GND
4	RS422_TX5+ RS485_D5+
5	RS422_TX5- RS485_D5-

NMEA Port 4

Connector type: 5-pin switch
Connector location: CN5

Pin	Definition
1	RS422_RX6+
2	RS422_RX6-
3	ISO_GND
4	RS422_TX6+ RS485_D6+
5	RS422_TX6- RS485_D6-

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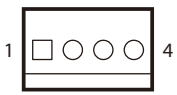
Internal Connectors

CPU Fan Connector

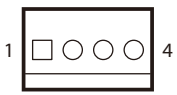
Connector type: 1x4 4-pin header, 2.54mm pitch
Connector location: J6



Pin	Definition
1	GND
2	+12V
3	CPUFANIN
4	CPUFANOUT

System Fan Connector

Connector type: 1x4 4-pin header, 2.54mm pitch
Connector location: J5



Pin	Definition
1	GND
2	+12V
3	SYSFANIN
4	SYSFANOUT

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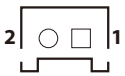
System Fan Connector

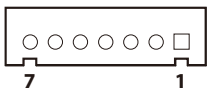
Connector type: 1x2 2-pin header, 2.54mm pitch
Connector location: J11



Pin	Definition
1	GND
2	+12V

LVDS Panel Backlight Connector

Connector type: 1x7 JST, 7-pin header, 2.5mm pitch
Connector location: J9



Pin	Definition	Pin	Definition
1	+5V	2	V_INV(+12V)
3	V_INV(+12V)	4	Panel Backlight Brightness Control
5	GND	6	GND
7	Panel Backlight Enable		

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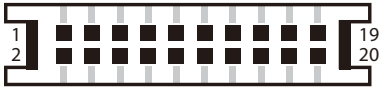
LVDS Connector

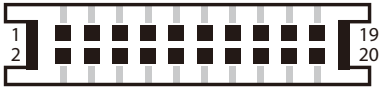
Connector type: 2x10 20-pin header, 1.25mm pitch
Connector location: CN1



Pin	Definition	Pin	Definition
1	LVDS_I2CCLK	2	LVDS_I2CDAT
3	VCC_LCD	4	LVDSA_DATA0
5	LVDSA_DATA3	6	LVDSA_DATA0#
7	LVDSA_DATA3#	8	VCC_LCD
9	GND	10	LVDSA_DATA1
11	LVDSA_CLK	12	LVDSA_DATA1#
13	LVDSA_CLK#	14	GND
15	GND	16	V_INV(+12V)
17	LVDSA_DATA2	18	V_INV(+12V)
19	LVDSA_DATA2#	20	GND

LVDS Connector

Connector type: 2x10 20-pin header, 1.25mm pitch
Connector location: CN3



Pin	Definition	Pin	Definition
1	LVDS_I2CCLK	2	LVDS_I2CDAT
3	VCC_LCD	4	LVDSB_DATA0
5	LVDSB_DATA3	6	LVDSB_DATA0#
7	LVDSB_DATA3#	8	VCC_LCD
9	GND	10	LVDSB_DATA1
11	LVDSB_CLK	12	LVDSB_DATA1#
13	LVDSB_CLK#	14	GND
15	GND	16	V_INV(+12V)
17	LVDSB_DATA2	18	V_INV(+12V)
19	LVDSB_DATA2#	20	GND

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USB Connector

Connector type: 1x6 JST, 6-pin header, 2.00mm pitch
Connector location: J7

Pin	Definition	Pin	Definition
1	+5V	2	USB4N
3	USB4P	4	USB5N
5	USB5P	6	GND

Line-out Pin Header

Connector type: 1x4 4-pin header, 2.00mm pitch
Connector location: JP4

Pin	Definition
1	FLOUT_L
2	LOUT_JD
3	GND
4	FLOUT_R

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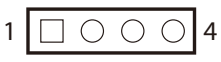
Mic-in Pin Header

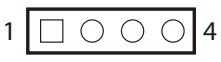
Connector type: 1x4 4-pin header, 2.00mm pitch
Connector location: JP3



Pin	Definition
1	MIC_L
2	MIC_JD
3	GND
4	MIC_R

Line-in Pin Header

Connector type: 1x4 4-pin header, 2.00mm pitch
Connector location: JP5



Pin	Definition
1	FLIN_L
2	LIN_JD
3	GND
4	FLIN_R

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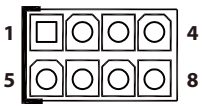
Power Connector

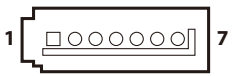
Connector type: 2x4 8-pin header
Connector location: CN4



Pin	Definition	Pin	Definition
1	+12VSB	2	+12VSB
3	+12VSB	4	POWER_STATUS
5	GND	6	GND
7	GND	8	GND

SATA1 Connector

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)
Connector location: J3



Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP0
3	SATA_TXN0	4	GND
5	SATA_RXN0	6	SATA_RXP0
7	GND		

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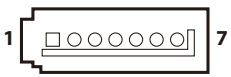
SATA2 Connector

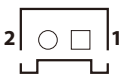
Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)
Connector location: J4



Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP1
3	SATA_TXN1	4	GND
5	SATA_RXN1	6	SATA_RXP1
7	GND		

SATA Power Connector

Connector type: 1x2 2-pin header, 2.5mm pitch
Connector location: J1



Pin	Definition
1	+5V
2	GND

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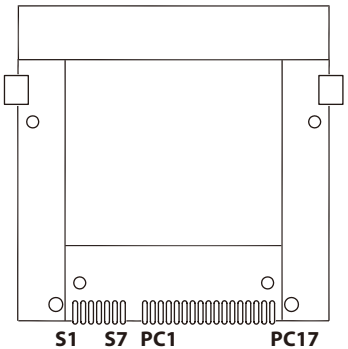
SATA Power Connector

Connector type: 1x2 2-pin header, 2.5mm pitch
Connector location: J2

Pin	Definition
1	+5V
2	GND

CFast Connector

Connector type:
Connector location: CN7



Pin	Definition	Pin	Definition
S1	GND	PC6	NC
S2	SATA_TXP2	PC7	GND
S3	SATA_TXN2	PC8	NC
S4	GND	PC9	CFAST_ACCESS
S5	SATA_RXN2	PC10	NC
S6	SATA_RXP2	PC11	NC
S7	GND	PC12	NC
PC1	CDI	PC13	+3.3V
PC2	GND	PC14	+3.3V
PC3	NC	PC15	GND
PC4	NC	PC16	GND
PC5	NC	PC17	NC

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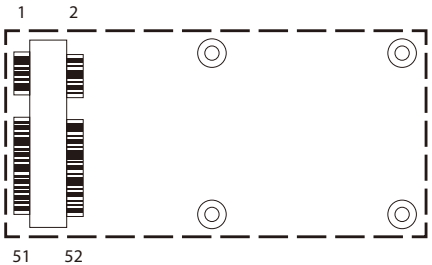
Mini-PCIe Connector

Connector location: CN5



Pin	Definition	Pin	Definition
1	PCIEWAKE#	2	+3VSB
3	N/A	4	GND
5	N/A	6	+1.5V
7	CLKREQ#	8	N/A
9	GND	10	N/A
11	REF CLK-	12	N/A
13	REF CLK+	14	N/A
15	GND	16	N/A
17	N/A	18	GND
19	N/A	20	Disable#
21	GND	22	RST#
23	PCIERX0-	24	+3VSB
25	PCIERX0+	26	GND

Pin	Definition	Pin	Definition
27	GND	28	+1.5V
29	GND	30	SMBCLK
31	PCIETX0-	32	SMBDATA
33	PCIETX0+	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3VSB	40	GND
41	+3VSB	42	N/A
43	GND	44	N/A
45	N/A	46	N/A
47	N/A	48	+1.5V
49	N/A	50	GND
51	N/A	52	+3VSB

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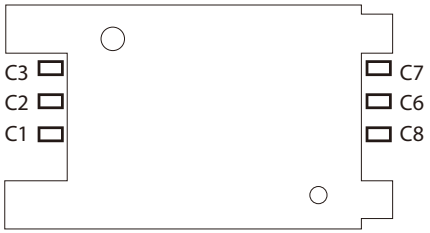
SIM Card Connector

Connector location: IDE1



Pin	Definition	Pin	Definition
C1	UIM_PWR	C2	UIM_RESET
C3	UIM_CLK	C5	GND
C6	UIM_VPP	C7	UIM_DATA

GPS Connector

Connector type: 1x6 6-pin header, 1.00mm pitch
Connector location: J16

Pin	Definition	Pin	Definition
1	+3VSB	2	NA
3	COM6_TXD	4	COM6_RXD
5	GND	6	+3.3V

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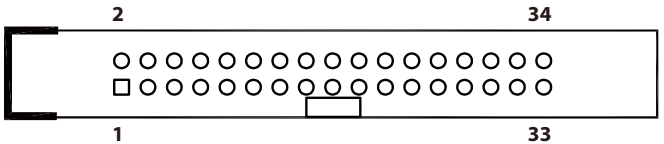
Box Header Connector

Connector type: 2x17 34-pin header, 2.54mm pitch
Connector location: CN2 on carrier board & CN7 on IO module



Pin	Signal	Pin	Signal	Pin	Signal
1	COM1_485_EN#	13	COM2_TXD	25	GPO2
2	COM1_RTS#	14	COM2_RXD	26	GPI2
3	COM2_485_EN#	15	COM3_TXD	27	GPO3
4	COM2_RTS#	16	COM3_RXD	28	GPI3
5	COM3_485_EN#	17	COM4_TXD	29	GND
6	COM3_RTS#	18	COM4_RXD	30	GND
7	COM4_485_EN#	19	GND	31	+5V
8	COM4_RTS#	20	GND	32	+5V
9	GND	21	GPO0	33	+5V
10	GND	22	GPI0	34	+5V
11	COM1_TXD	23	GPO1		
12	COM1_RXD	24	GPI1		

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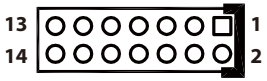
PWR_BT/RET_BT/LED/SM BUS Pin Header

Connector type: 2x17 34-pin header, 2.00mm pitch
Connector location: JP1



Pin	Definition	Pin	Definition
1	PWR_LED_N	2	PWR_LED_P
3	SATA_LED#	4	SATA_LED_P
5	SMB_C	6	SMB_D
7	VCC3V3	8	GND
9	PM_SLP_S3	10	PSON
11	POWER BOTTOM	12	GND
13	RESET BOTTOM	14	GND

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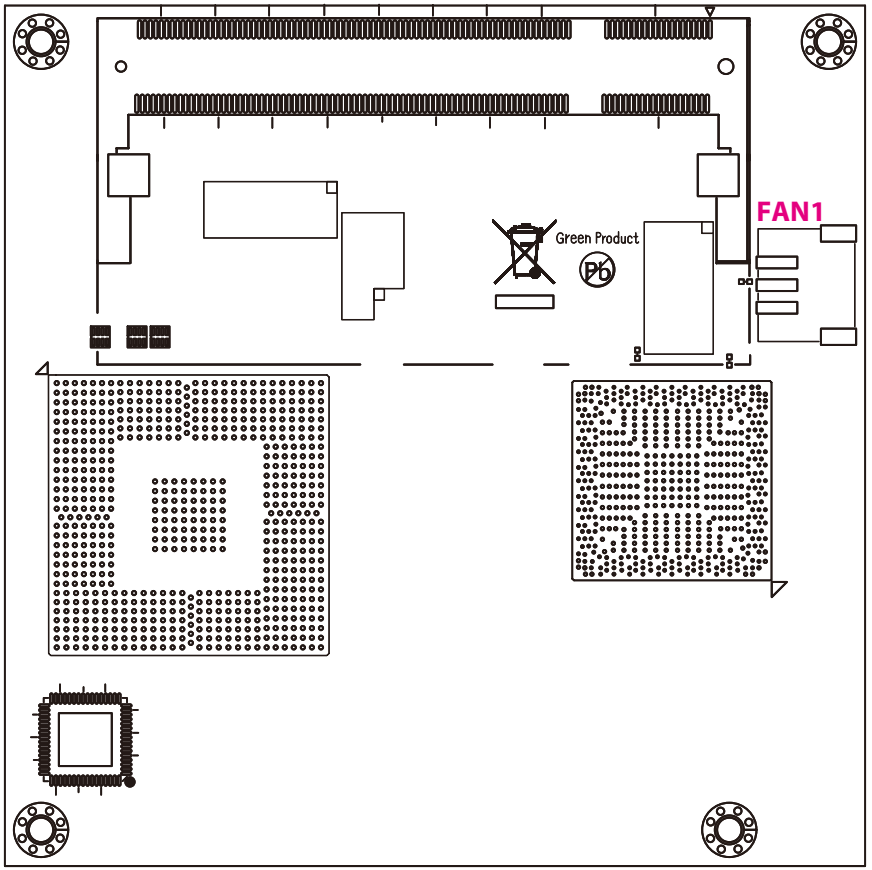
Locations of the Jumpers and Connectors for ICES253-600

ICES253-600 - Top

The figure below shows the location of the jumpers and connectors.



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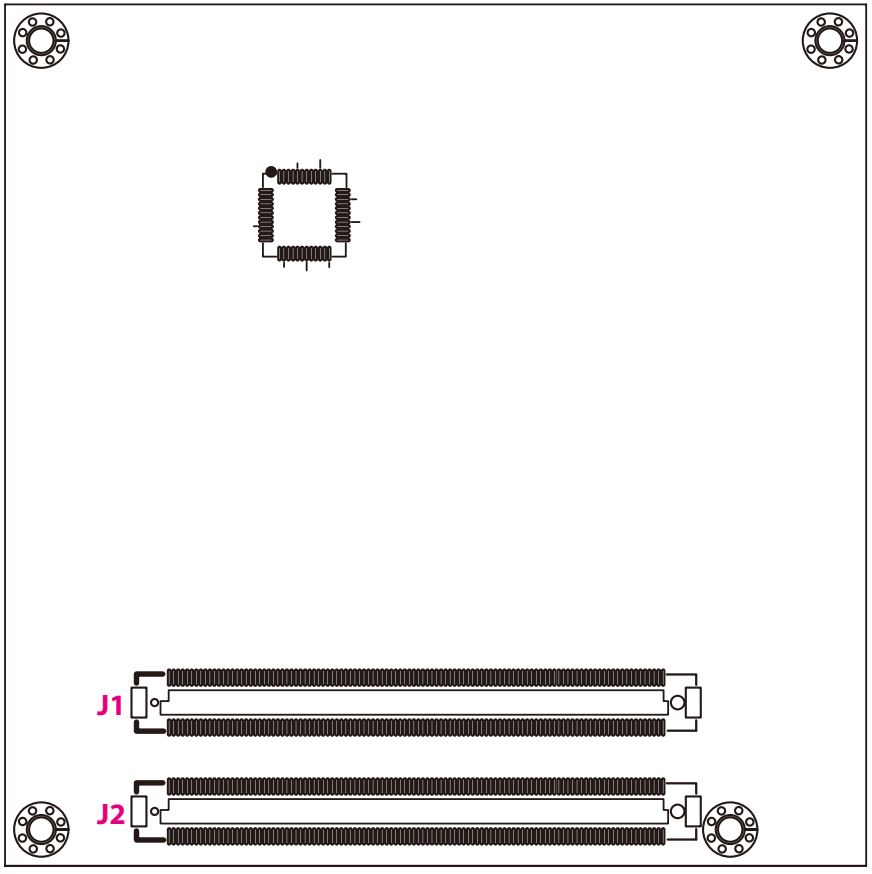
ICES253-600 - Bottom

The figure below shows the location of the jumpers and connectors.



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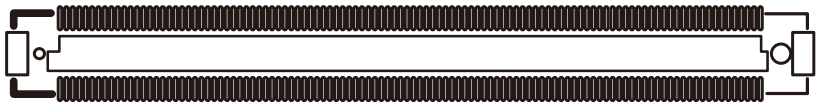
Connector Pin Definitions

Internal Connectors

High Speed Board-to-Board Connector: Row A and B

Connector location: J2



Pin	Definition	Pin	Definition
A1	GND	B1	GND
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK100#	B4	LPC_AD0
A5	GBE0_LINK1000#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK#	B8	LPC_DRQ0#
A9	GBE0_MDI1-	B9	LPC_DRQ1#
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND	B11	GND
A12	GBE0_MDI0-	B12	PWRBTN#
A13	GBE0_MDI0+	B13	SMB_CK
A14	GBE0_CTREF	B14	SMB_DAT
A15	SUS_S3#	B15	SMB_ALERT#

Pin	Definition	Pin	Definition
A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	SUS_STAT#
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND	B21	GND
A22	SATA2_TX+	B22	NC
A23	SATA2_TX-	B23	NC
A24	SUS_S5#	B24	PWR_OK
A25	SATA2_RX+	B25	NC
A26	SATA2_RX-	B26	NC
A27	BATLOW#	B27	NC
A28	ATA_ACT#	B28	AC_SDIN2
A29	AC_SYNC	B29	AC_SDIN1
A30	AC_RST#	B30	AC_SDIN0

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Pin	Definition	Pin	Definition
A31	GND	B31	GND
A32	AC_BITCLK	B32	SPKR
A33	AC_SDOUT	B33	I2C_CK
A34	BIOS_DISABLE#	B34	I2C_DAT
A35	THRMTRIP#	B35	THRM#
A36	USB6-	B36	USB7-
A37	USB6+	B37	USB7+
A38	USB_6_7_OC#	B38	USB_4_5_OC#
A39	USB4-	B39	USB5-
A40	USB4+	B40	USB5+
A41	GND	B41	GND
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	NC
A48	EXCD0_PERST#	B48	NC
A49	EXCD0_CPPE#	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND	B51	GND
A52	NC	B52	NC
A53	NC	B53	NC
A54	GPI0	B54	GPO1
A55	PCIE_TX4+	B55	PCIE_RX4+
A56	PCIE_TX4-	B56	PCIE_RX4-
A57	GND	B57	GPO2
A58	PCIE_TX3+	B58	PCIE_RX3+

Pin	Definition	Pin	Definition
A59	PCIE_TX3-	B59	PCIE_RX3-
A60	GND	B60	GND
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-
A63	GPI1	B63	GPO3
A64	PCIE_TX1+	B64	PCIE_RX1+
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND	B66	WAKE0#
A67	GPI2	B67	WAKE1#
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND	B70	GND
A71	LVDS_A0+	B71	NC
A72	LVDS_A0-	B72	NC
A73	LVDS_A1+	B73	NC
A74	LVDS_A1+	B74	NC
A75	LVDS_A2+	B75	NC
A76	LVDS_A2+	B76	NC
A77	LVDS_VDD_EN	B77	NC
A78	NC	B78	NC
A79	NC	B70	LVDS_BKLT_EN
A80	GND	B80	GND
A81	LVDS_A_CK+	B81	NC
A82	LVDS_A_CK-	B82	NC
A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A84	LVDS_I2C_DAT	B84	VCC_5V_SBY
A85	GPI3	B85	VCC_5V_SBY
A86	KBD_RST#	B86	VCC_5V_SBY

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Pin	Definition	Pin	Definition
A87	KBD_A20GATE	B87	VCC_5V_SBY
A88	PCIE0_CK_REF+	B88	NC
A89	PCIE0_CK_REF-	B89	VGA_RED
A90	GND	B90	GND
A91	RSVD	B91	VGA_GRN
A92	RSVD	B92	VGA_BLU
A93	GPO0	B93	VGA_HSYNC
A94	RSVD	B94	VGA_VSYNC
A95	RSVD	B95	VGA_I2C_CK
A96	GND	B96	VGA_I2C_DAT
A97	VCC_12V	B97	NC
A98	VCC_12V	B98	NC
A99	VCC_12V	B99	NC
A100	GND	B100	GND
A101	VCC_12V	B101	VCC_12V
A102	VCC_12V	B102	VCC_12V
A103	VCC_12V	B103	VCC_12V
A104	VCC_12V	B104	VCC_12V
A105	VCC_12V	B105	VCC_12V
A106	VCC_12V	B106	VCC_12V
A107	VCC_12V	B107	VCC_12V
A108	VCC_12V	B108	VCC_12V
A109	VCC_12V	B109	VCC_12V
A110	GND	B110	GND

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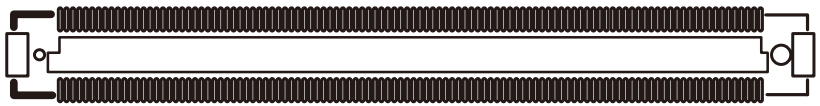
High Speed Board-to-Board Connector: Row C and D

Connector location: J1



Pin	Definition	Pin	Definition
C1	GND	D1	GND
C2	IDE_D7	D2	IDE_D5
C3	IDE_D6	D3	IDE_D10
C4	IDE_D3	D4	IDE_D11
C5	IDE_D15	D5	IDE_D12
C6	IDE_D8	D6	IDE_D4
C7	IDE_D9	D7	IDE_D0
C8	IDE_D2	D8	IDE_REQ
C9	IDE_D13	D9	IDE_IOW#
C10	IDE_D1	D10	IDE_ACK#
C11	GND	D11	GND
C12	IDE_D14	D12	IDE_IRQ
C13	IDE_IORDY	D13	IDE_A0
C14	IDE_IOR#	D14	IDE_A1
C15	PCI_PME#	D15	IDE_A2
C16	PCI_GNT2#	D16	IDE_CS1#

Pin	Definition	Pin	Definition
C17	PCI_REQ2#	D17	IDE_CS3#
C18	PCI_GNT1#	D18	IDE_RESET#
C19	PCI_REQ1#	D19	PCI_GNT3#
C20	PCI_GNT0#	D20	PCI_REQ3#
C21	GND	D21	GND
C22	PCI_REQ0#	D22	PCI_AD1
C23	PCI_RESET#	D23	PCI_AD3
C24	PCI_AD0	D24	PCI_AD5
C25	PCI_AD2	D25	PCI_AD7
C26	PCI_AD4	D26	PCI_C/BE0#
C27	PCI_AD6	D27	PCI_AD9
C28	PCI_AD8	D28	PCI_AD11
C29	PCI_AD10	D29	PCI_AD13
C30	PCI_AD12	D30	PCI_AD15
C31	GND	D31	GND
C32	PCI_AD14	D32	PCI_PAR

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Pin	Definition	Pin	Definition
C33	PCI_C/BE1#	D33	PCI_SERR#
C34	PCI_PERR#	D34	PCI_STOP#
C35	PCI_LOCK#	D35	PCI_TRDY#
C36	PCI_DEVSEL#	D36	PCI_FRAME#
C37	PCI_IRDY#	D37	PCI_AD16
C38	PCI_C/BE2#	D38	PCI_AD18
C39	PCI_AD17	D39	PCI_AD20
C40	PCI_AD19	D40	PCI_AD22
C41	GND	D41	GND
C42	PCI_AD21	D42	PCI_AD24
C43	PCI_AD23	D43	PCI_AD26
C44	PCI_C/BE3#	D44	PCI_AD28
C45	PCI_AD25	D45	PCI_AD30
C46	PCI_AD27	D46	PCI_IRQC#
C47	PCI_AD29	D47	PCI_IRQD#
C48	PCI_AD31	D48	PCI_CLKRUN#
C49	PCI_IRQA#	D49	PCI_M66EN
C50	PCI_IRQB#	D50	PCI_CLK
C51	GND	D51	GND
C52	NC	D52	NC
C53	NC	D53	NC
C54	NC	D54	NC
C55	NC	D55	NC
C81	NC	D81	NC
C82	NC	D82	NC
C83	NC	D83	NC

Pin	Definition	Pin	Definition
C84	GND	D84	GND
C85	NC	D85	NC
C86	NC	D86	NC
C87	GND	D87	GND
C88	NC	D88	NC
C89	NC	D89	NC
C90	GND	D90	GND
C91	NC	D91	NC
C92	NC	D92	NC
C93	GND	D93	GND
C94	NC	D94	NC
C95	NC	D95	NC
C96	GND	D96	GND
C97	NC	D97	NC
C98	NC	D98	NC
C99	NC	D99	NC
C100	GND	D100	GND
C101	NC	D101	NC
C102	NC	D102	NC
C103	GND	D103	GND
C104	VCC_12V	D104	VCC_12V
C105	VCC_12V	D105	VCC_12V
C106	VCC_12V	D106	VCC_12V
C107	VCC_12V	D107	VCC_12V
C108	VCC_12V	D108	VCC_12V
C109	VCC_12V	D109	VCC_12V
C110	GND	D110	GND

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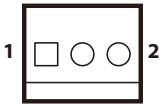
CPU FAN Connector

Connector type: 1x3 3-pin header, 2.54mm pitch
Connector location: FAN1



Pin	Definition
1	GND
2	+12V
3	FAN_SENSOR

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Chapter 3: System Setup

Removing the Chassis Cover

Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

Before you stare, please kindly make sure that you have a torx screwdriver with you.

Torx Screwdriver

1. With the bottom side of the chassis facing up, remove the mounting screw of the bottom cover and then put them in a safe place for later use.

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2. Remove 3 screws on the top of the rear panel and then put them in a safe place for later use.

3. Remove 3 screws on the top of the front panel and then put them in a safe place for later use.

4. Lift up the cover and remove it from the chassis.

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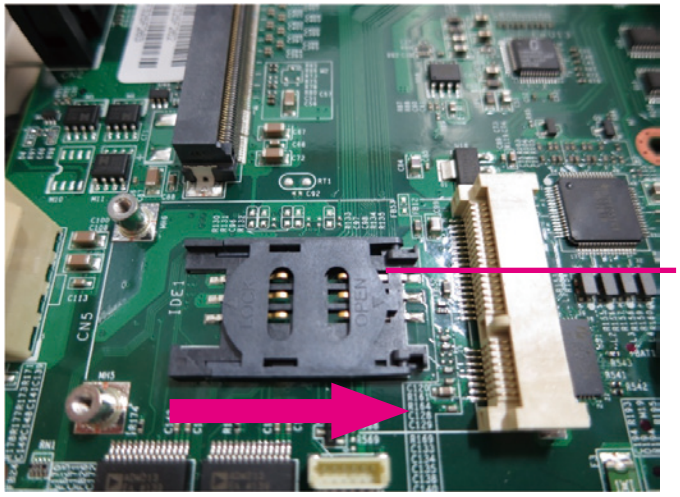
Installing the SIM Card

1. Slide the SIM card holder to the "OPEN" position and left the card holder.



2. Slide the SIM card into the SIM card holder.

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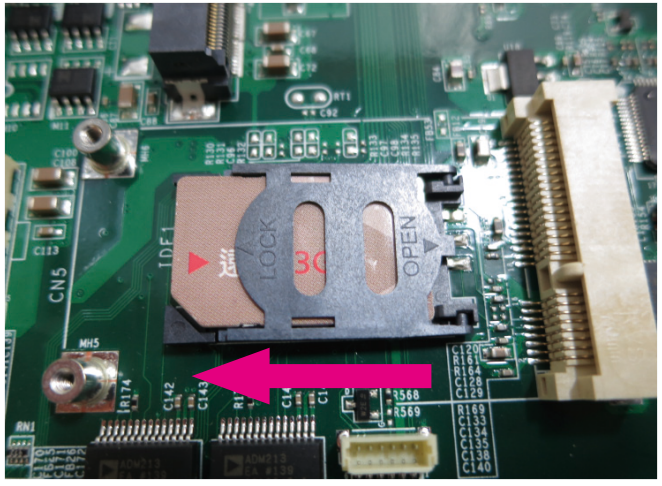
3. Move the holder down and then slide it to the “LOCK” position.



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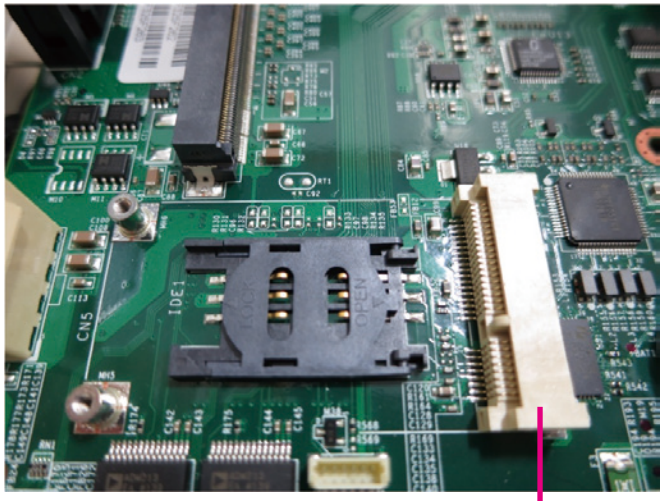
Installing a Wireless LAN Module

1. Locate for the Mini PCI Express slot on the board.



2. Insert the wireless LAN module into the Mini PCI Express slot at a 45 degree angle until the gold-plated connector on the edge of the module completely disappears inside the slot.

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3. Push the module down and then secure it with mounting screws.

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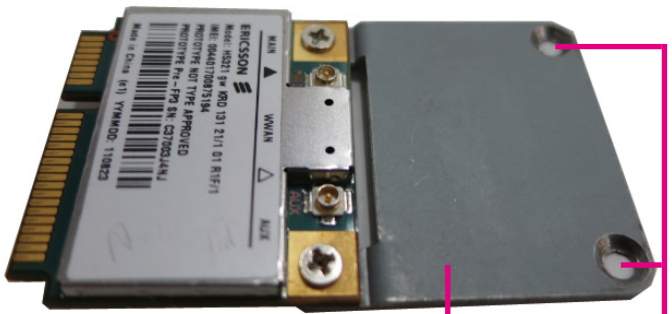
Installing a Wireless LAN Module (Bracket)



1. Insert the wireless LAN module into the Mini PCI Express slot at a 45 degree angle until the gold-plated connector on the edge of the module completely disappears inside the slot.

2. Push the module down and then secure it with mounting screws.

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Installing a Hard Drive

1. Locate for the HDD tray in the front panel.

2. Loose both screws to release the HDD tray.

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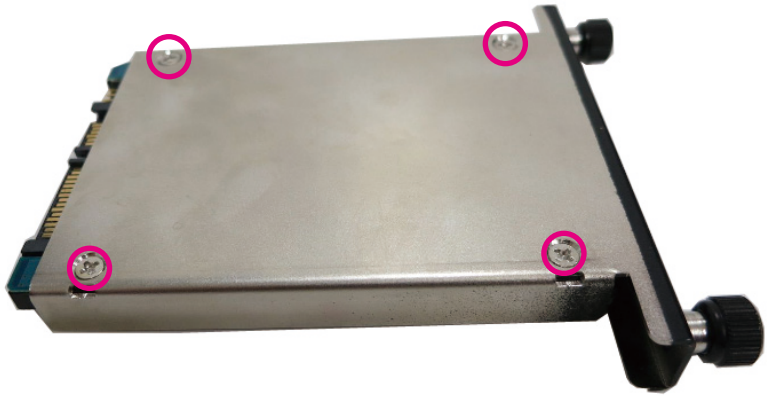
3. Use the provided screws to secure the drive in place.



4. Secure the HDD tray back to its original position.

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Installing a CFast Card

1. The CFast socket is located at the front side of the chassis.

2. Remove the mounting screws of the CFast socket's cover.

3. Remove the socket's cover to access the CFast socket.

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Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for the nTUF 600. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM Web site at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

- This program should be executed under the following conditions:
- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

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Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

TO ENTER SETUP BEFORE BOOT PRESS Ctrl + Alt + Esc

Press the Del key to enter Setup:

Legends

Key	Function
← →	Moves the highlight left or right to select a menu.
↑ ↓	Moves the highlight up or down between sub-menus or fields.
Esc	Exits the BIOS Setup Utility.
+	Scrolls forward through the values or options of the highlighted field.
–	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
F1	Displays General Help.
F10	Saves and exits the Setup program.
Enter	Press <Enter> to enter the highlighted sub¬menu

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Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press

.

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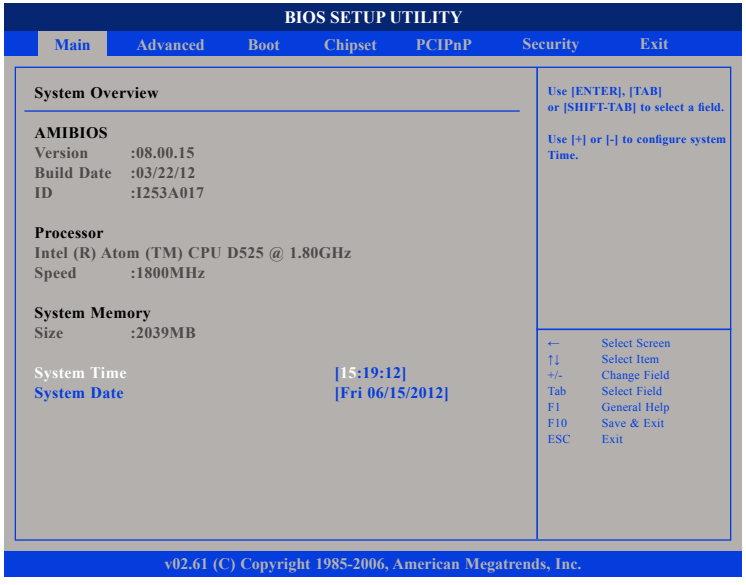
BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press Enter to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Monday to Sunday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

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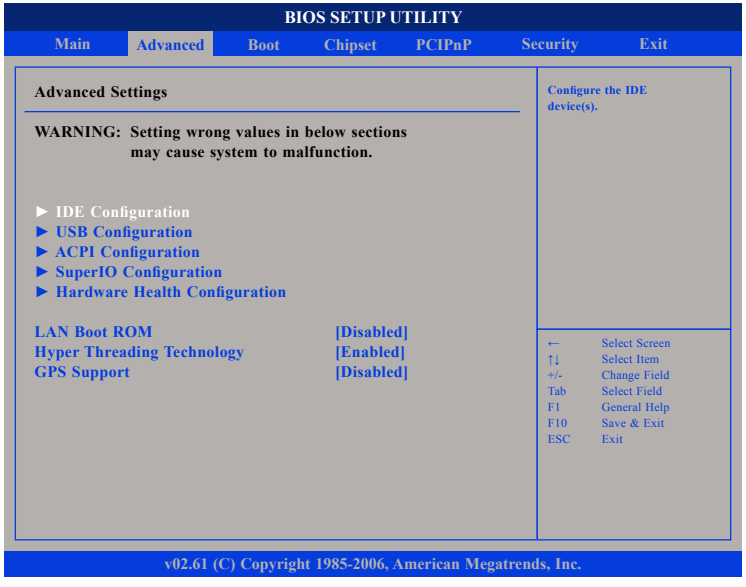
Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



LAN Boot ROM
Enables or disables the LAN Boot Rom.

Hyper Threading Technology
Disable or Enable hyper-threading technology.

GPS Support
Enables or disables GPS function.

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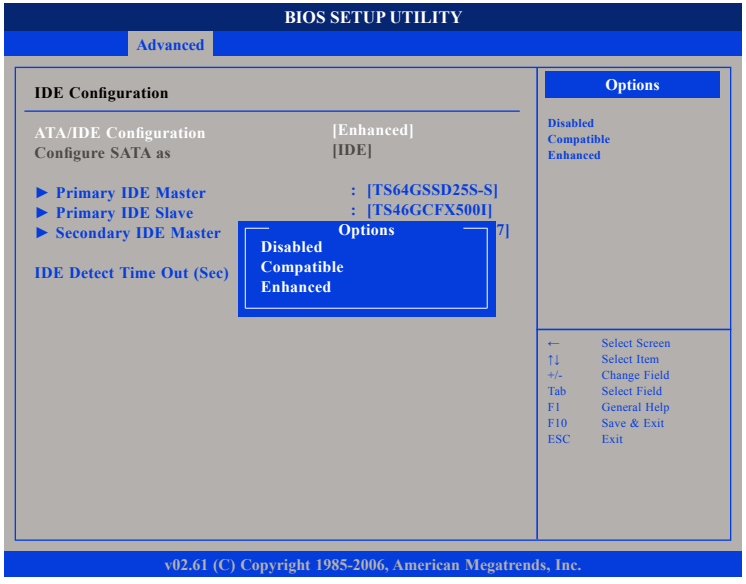
IDE Configuration

This section is used to configure IDE devices.



ATA/IDE Configuration

This field is used to configure the IDE drives. The options are Disabled, Compatible and Enhanced.

Configure SATA as

IDE This option configures the Serial ATA drives as Parallel ATA physical storage device.

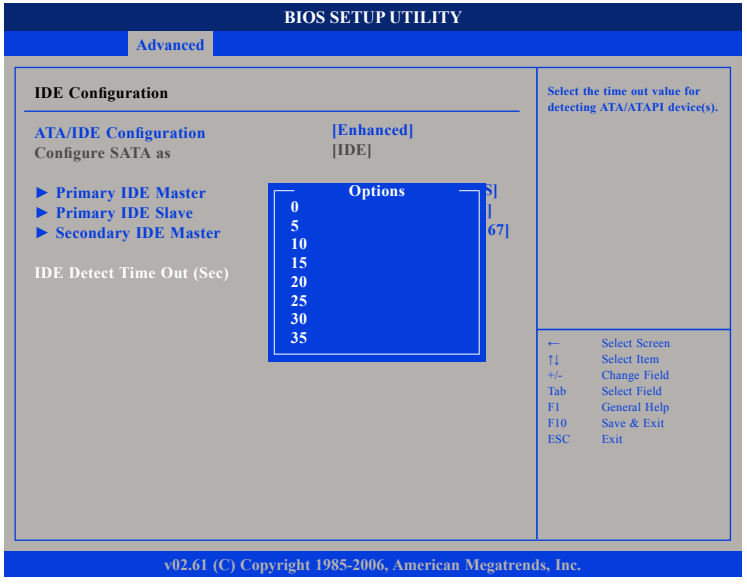
AHCI This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

Primary IDE Master to Third IDE Master

When you enter the BIOS Setup Utility, the BIOS will auto detect the existing IDE devices then displays the status of the detected devices. To configure an IDE drive, move the cursor to a field then press <Enter>.

IDE Detect Time Out (Sec)

Selects the time out value for detecting ATA/ATAPI devices.



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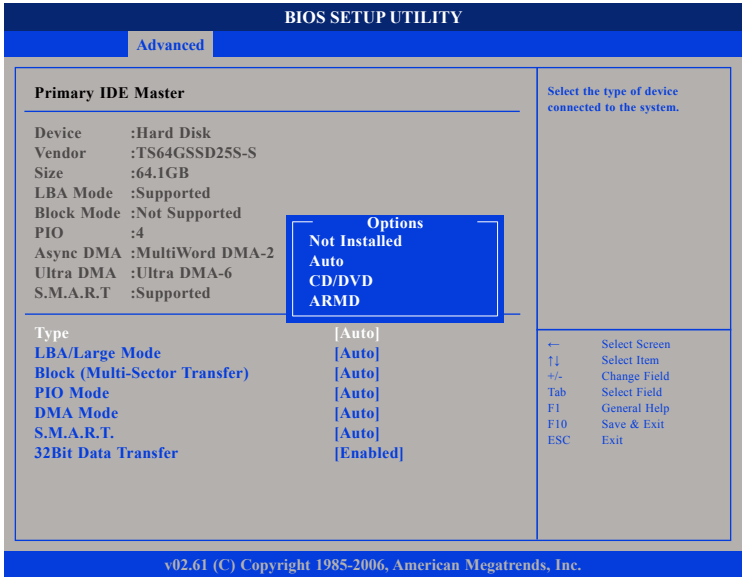
Primary IDE Master

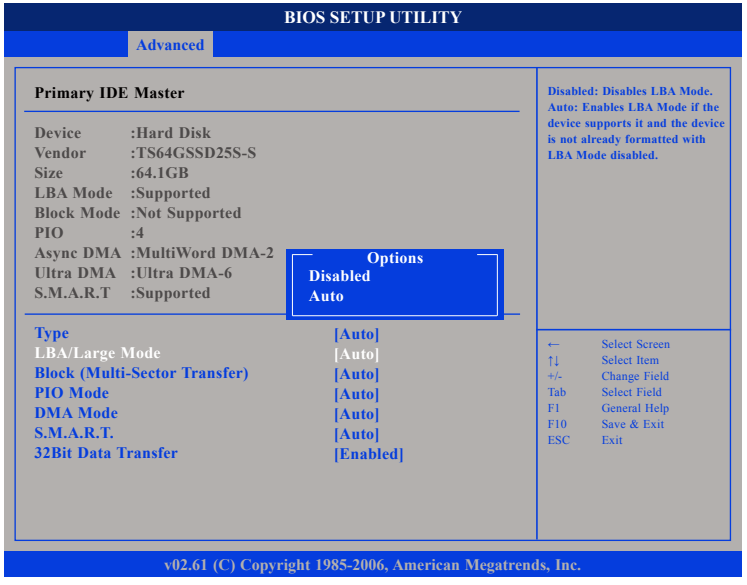
This section is used to configure the primary IDE master device.

Type



Select the type of device connected to the system, the options are Not Installed, Auto, CD/DVD and ARMD.

LBA/Large Mode



Disabled	Disables LBA mode
Auto	Enables LBA mode if the device supports it and the device is not already formatted with LBA mode disabled.

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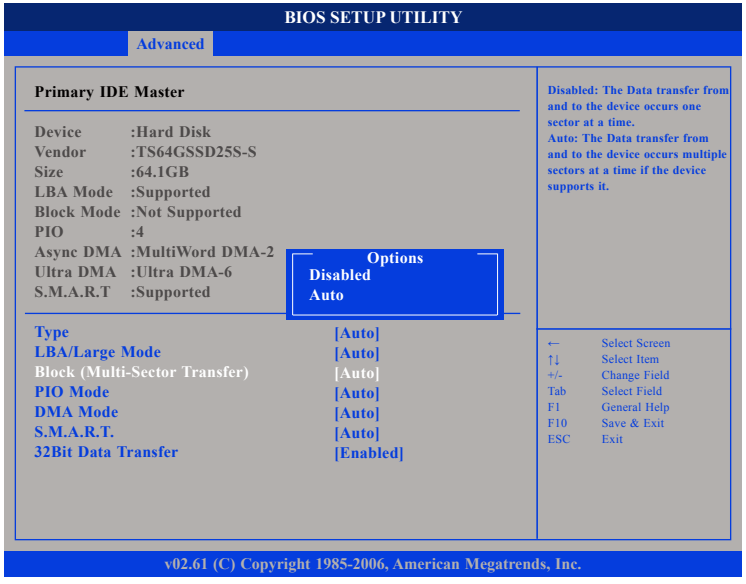
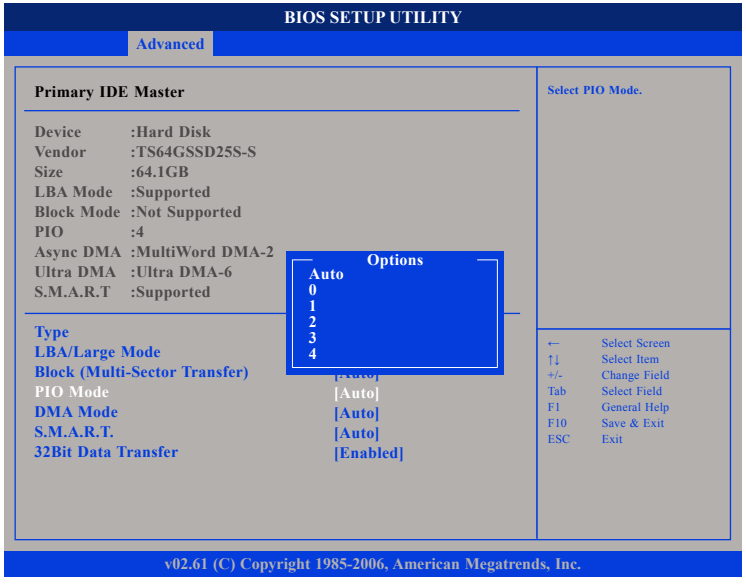
Block



Disabled — The data transfer from and to the device occurs one sector at a time

Auto — The data transfer from and to the device occurs multiple sectors at a time if the device supports it

PIO Mode



Selects the PIO mode.

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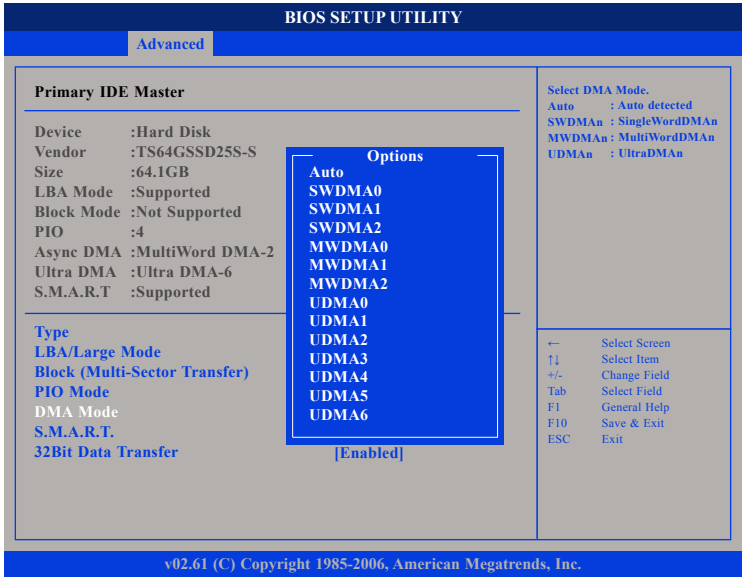
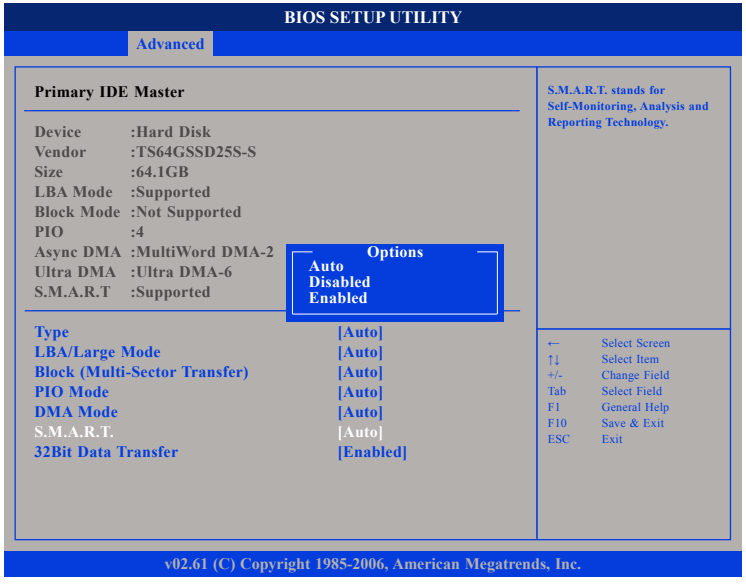
DMA Mode



Selects the DMA mode.

Auto	Auto detected
SWDMAn	SingleWordDMAn
MWDMAn	MultiWordDMAn
UDMAn	UltraDMAn

S.M.A.R.T.



Enables, disables or automatically detect Self-Monitoring, Analysis and Reporting Technology.

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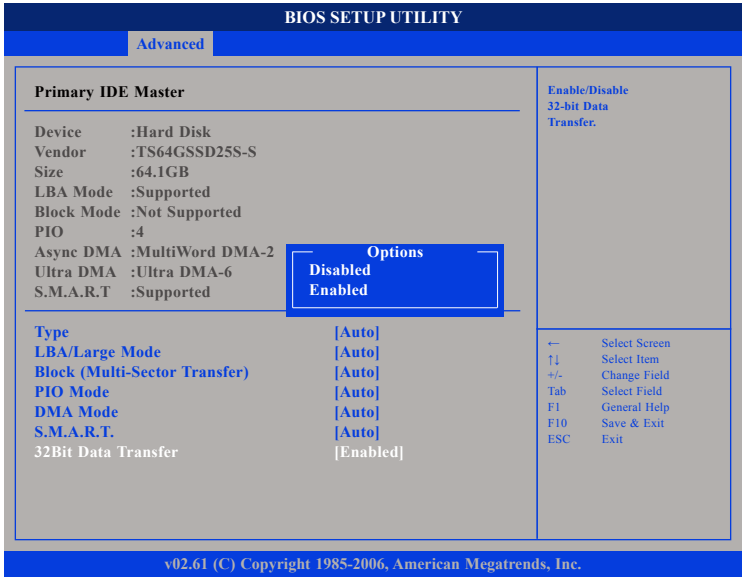
32Bit Data Transfer



Enables or disables 32-bt data transfer.

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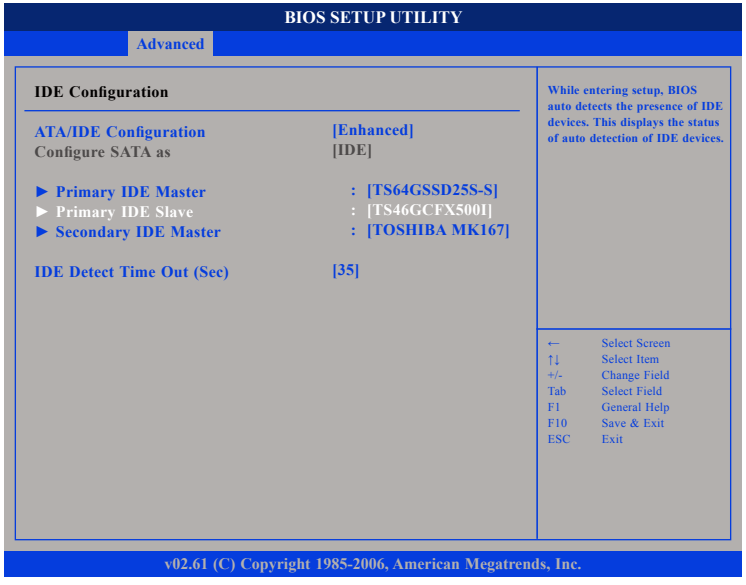
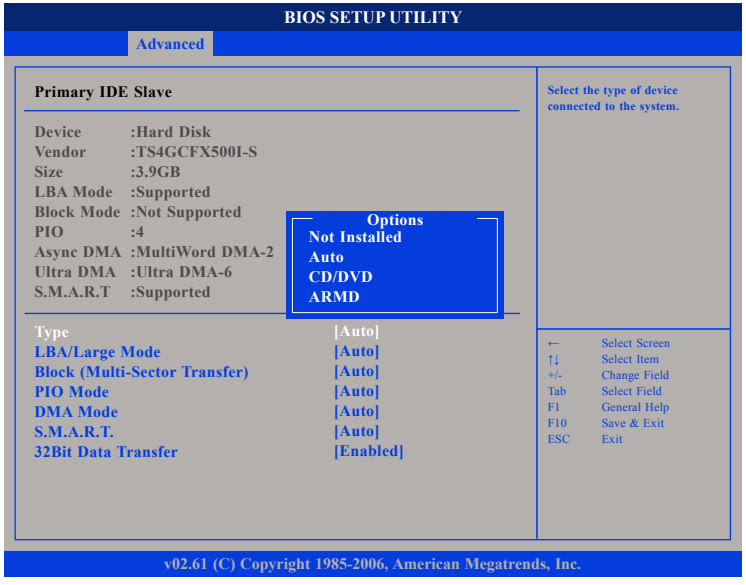
Primary IDE Slave

This section is used to configure the primary IDE slave device.



Type



Select the type of device connected to the system, the options are Not Installed, Auto, CD/DVD and ARMD.

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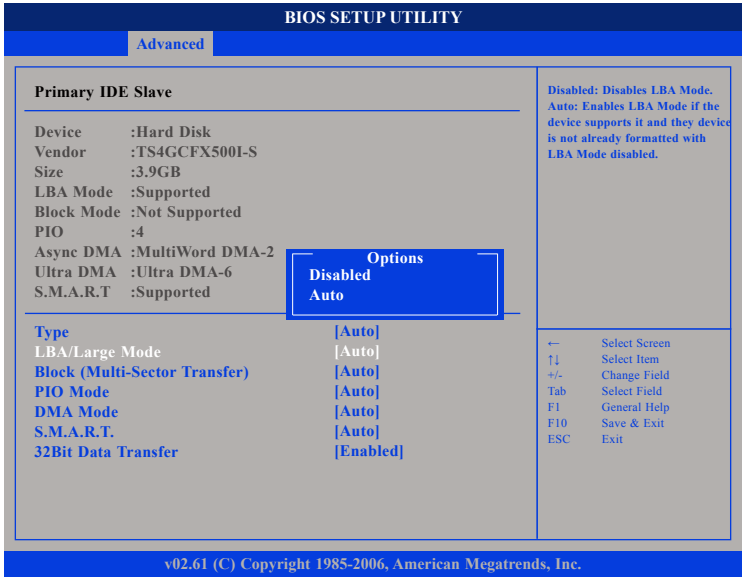
LBA/Large Mode



Disabled	Disables LBA mode
Auto	Enables LBA mode if the device supports it and the device is not already formatted with LBA mode disabled.

Block

Disabled	The data transfer from and to the device occurs one sector at a time
Auto	The data transfer from and to the device occurs multiple sectors at a time if the device supports it

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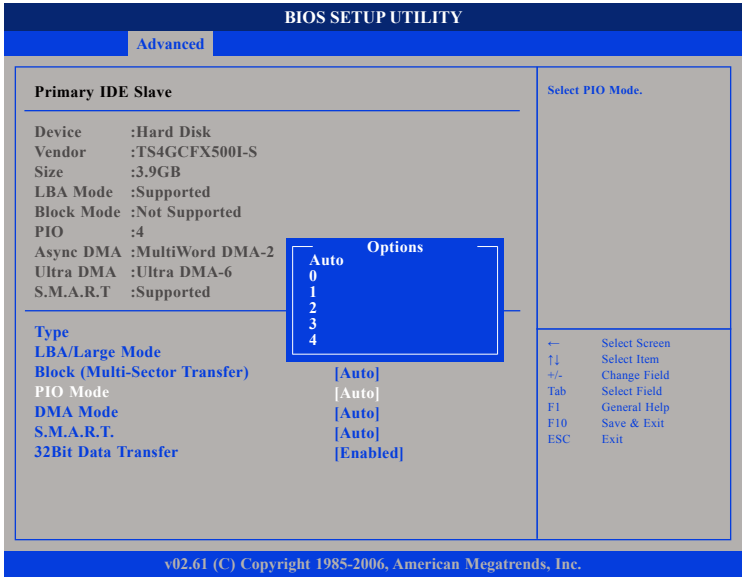
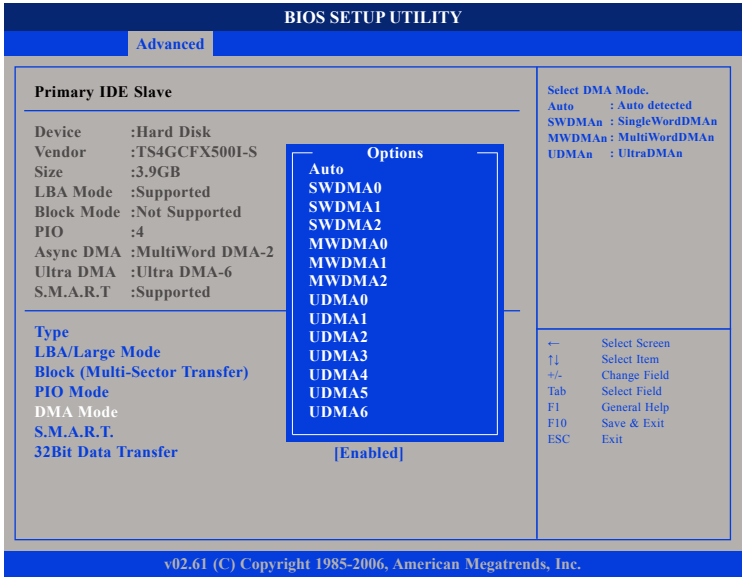
PIO Mode



Selects the PIO mode.

DMA Mode



Selects the DMA mode.

Auto	Auto detected
SWDMAn	SingleWordDMAn
MWDMAn	MultiWordDMAn
UDMAn	UltraDMAn

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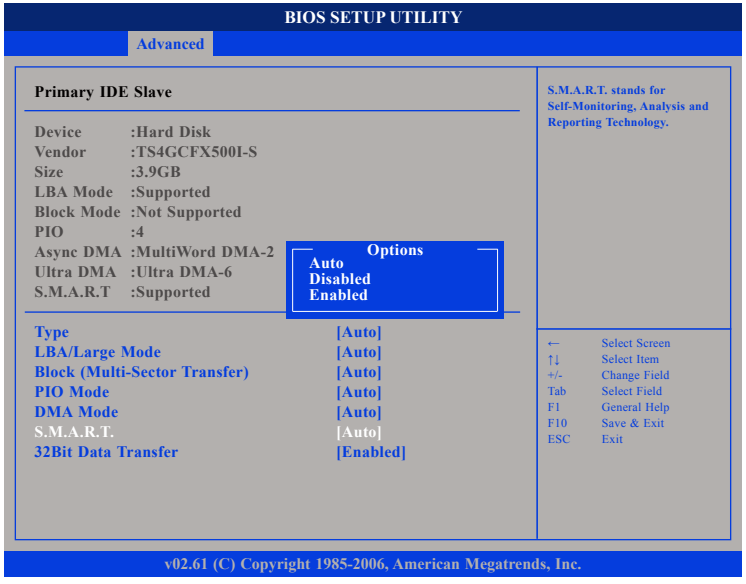
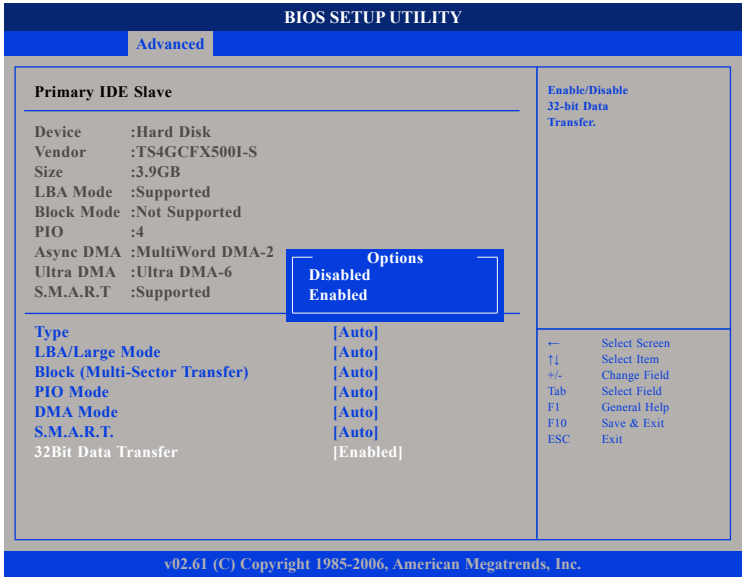
S.M.A.R.T.



Enables, disables or automatically detect Self-Monitoring, Analysis and Reporting Technology.

32Bit Data Transfer



Enables or disables 32-bt data transfer.

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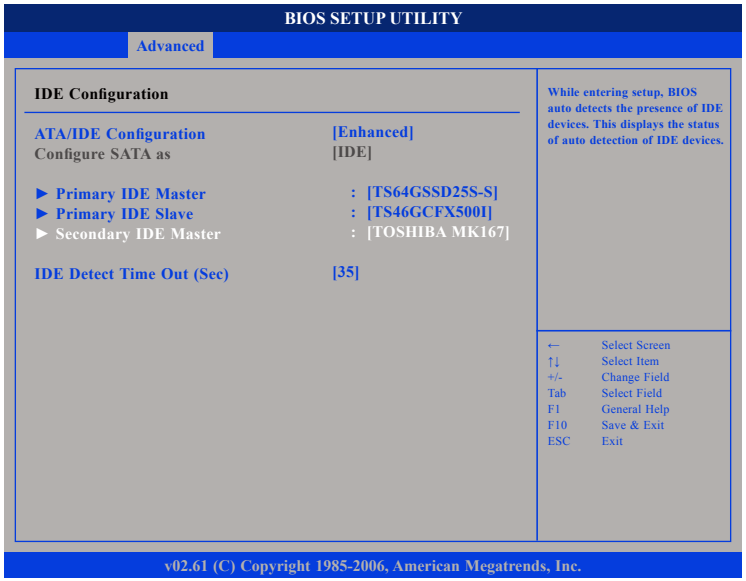
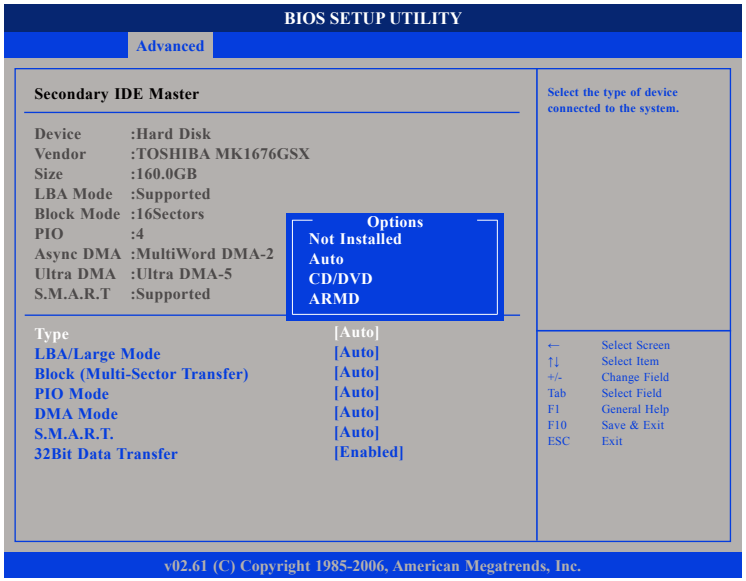
Secondary IDE Master

This section is used to configure the secondary IDE master device.



Type



Select the type of device connected to the system, the options are Not Installed, Auto, CD/DVD and ARMD.

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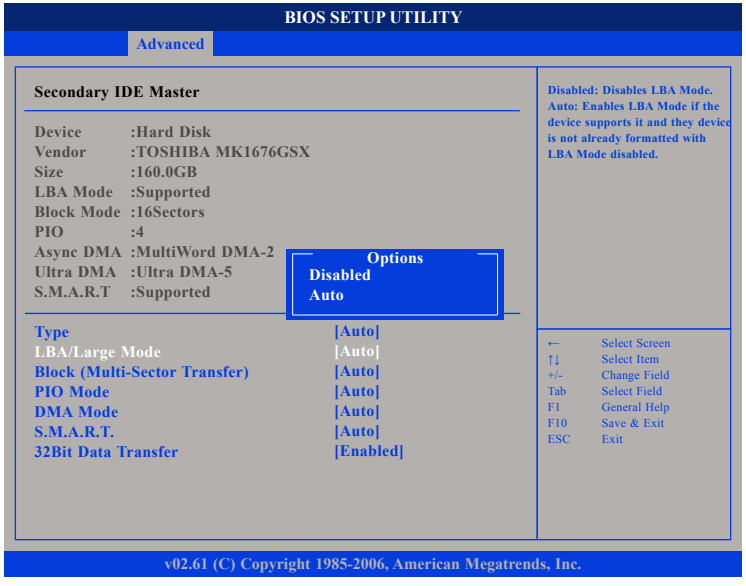
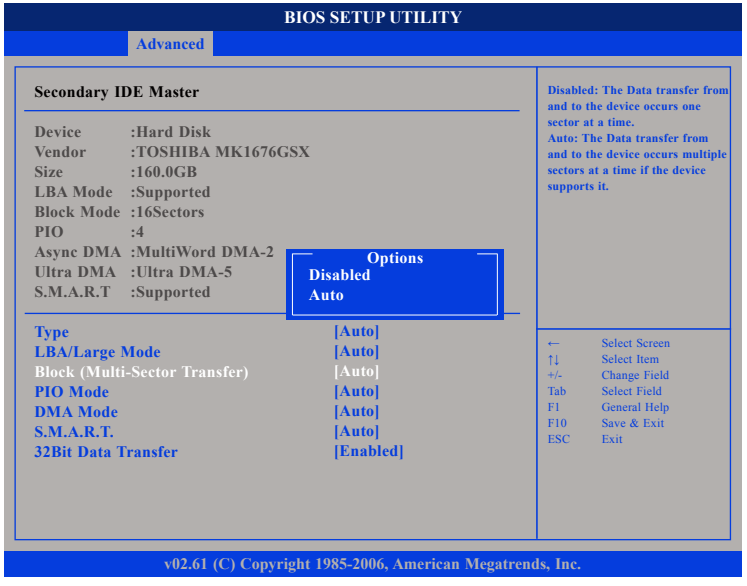
LBA/Large Mode



Disabled	Disables LBA mode
Auto	Enables LBA mode if the device supports it and the device is not already formatted with LBA mode disabled.

Block



Disabled	The data transfer from and to the device occurs one sector at a time
Auto	The data transfer from and to the device occurs multiple sectors at a time if the device supports it

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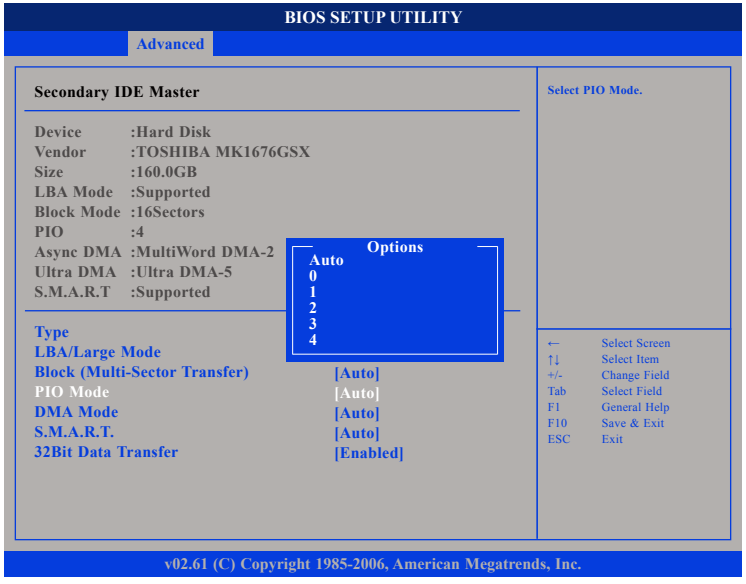
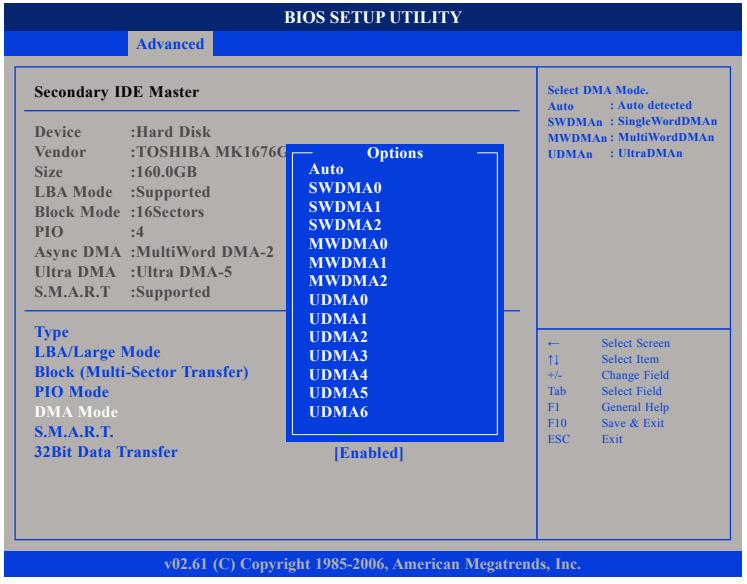
PIO Mode



Selects the PIO mode.

DMA Mode



Selects the DMA mode.

Auto	Auto detected
SWDMAn	SingleWordDMAn
MWDMAn	MultiWordDMAn
UDMAn	UltraDMAn

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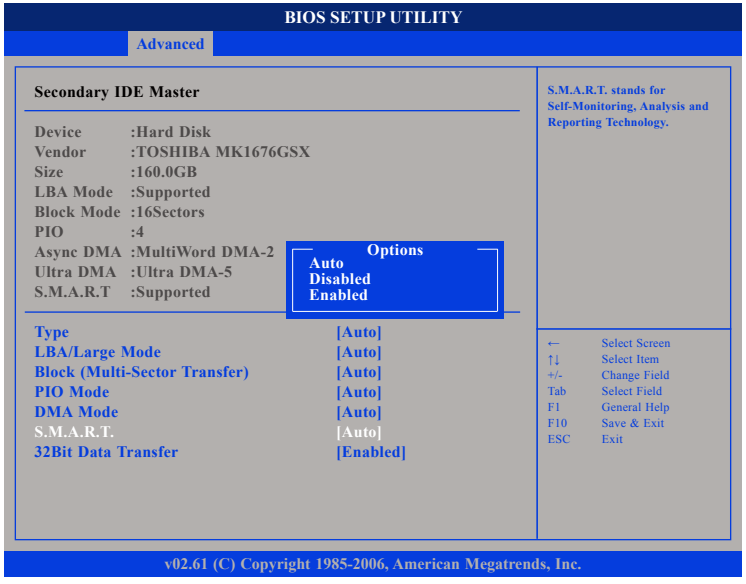
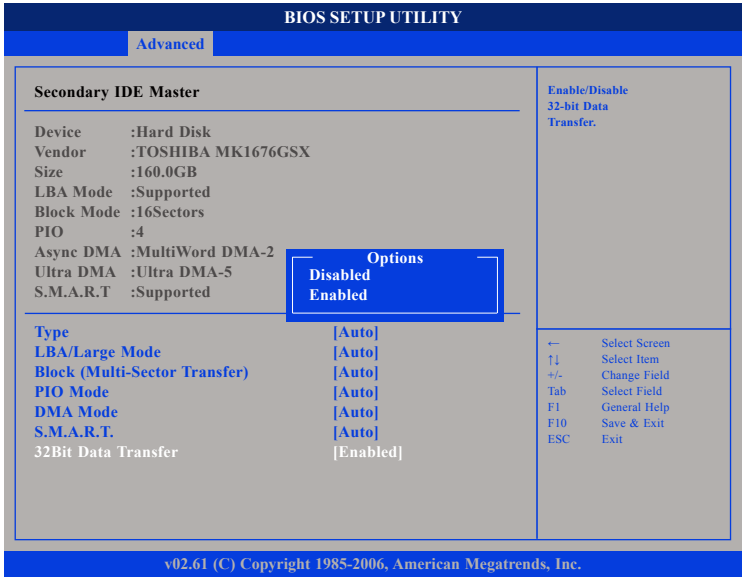
S.M.A.R.T.



Enables, disables or automatically detect Self-Monitoring, Analysis and Reporting Technology.

32Bit Data Transfer



Enables or disables 32-bt data transfer.

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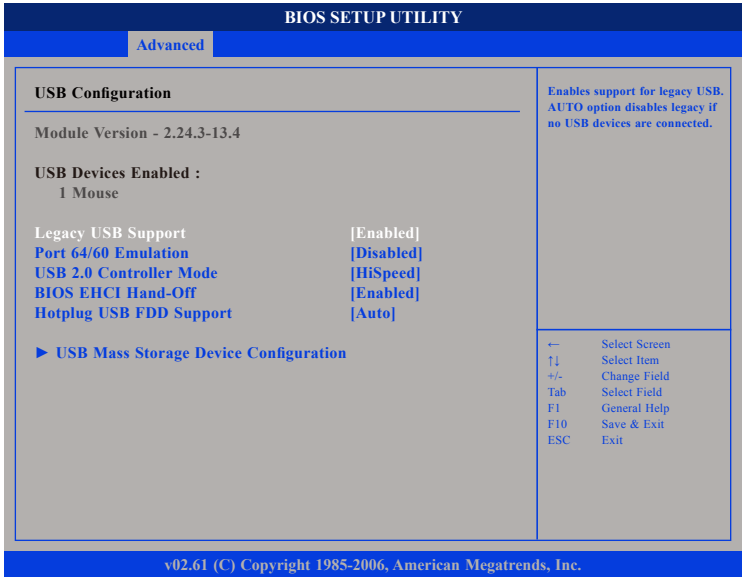
USB Configuration

This section is used to configure USB devices.



Legacy USB Support
Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

Port 64/60 Emulation
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

USB 2.0 Controller Mode
Sets the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps).

BIOS EHCI Hand-Off
Enable this field when using operating systems without the EHCI handoff support.

Hotplug USB FDD Support
Enables support for USB FDD hot plug.

USB Mass Storage Device Configuration
Configuration for USB mass storage class devices.

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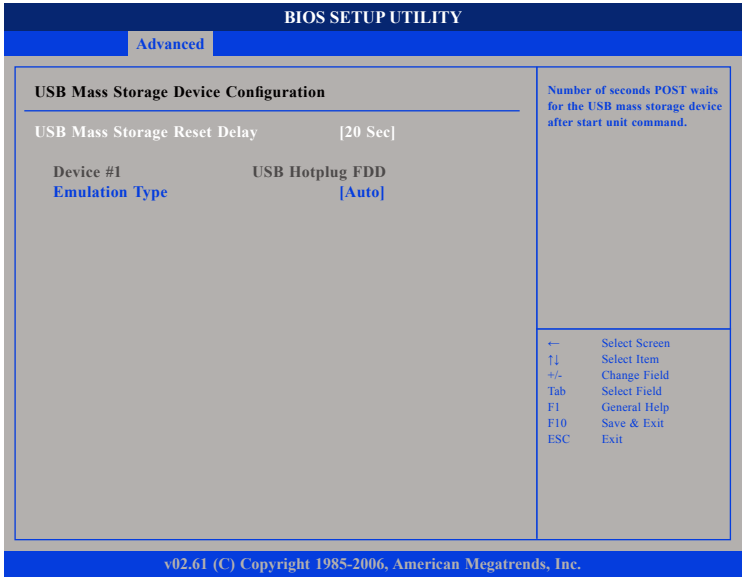
USB Mass Storage Device Configuration



USB Mass Storage Reset Delay

Configures the number of seconds POST waits for the USB mass storage device after start unit command.

Emulation Type

Selects the emulation type, in Auto, USB devices less than 530MB will be emulated as Floppy and remaining as hard drive. Force FDD option can be used to force a HDD formatted drive to boot as FDD. Other available options are Floppy, Hard Disk and CD ROM.

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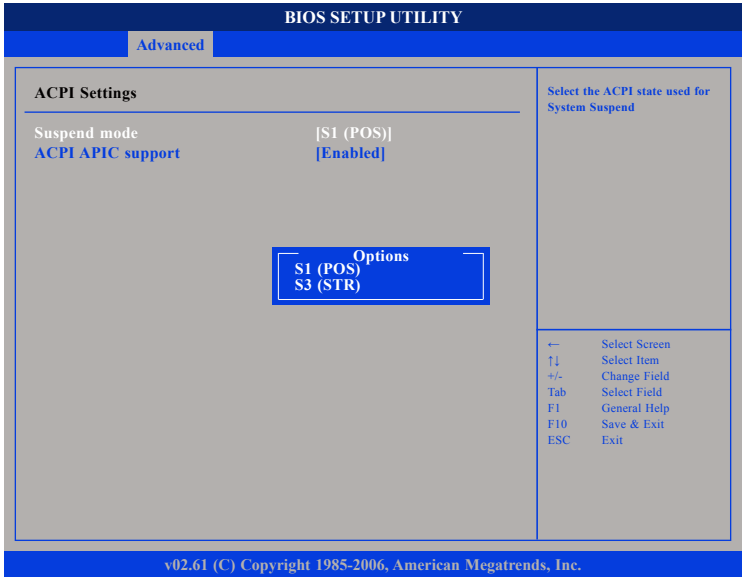
ACPI Configuration

This section is used to configure ACPI Settings.



Suspend Mode

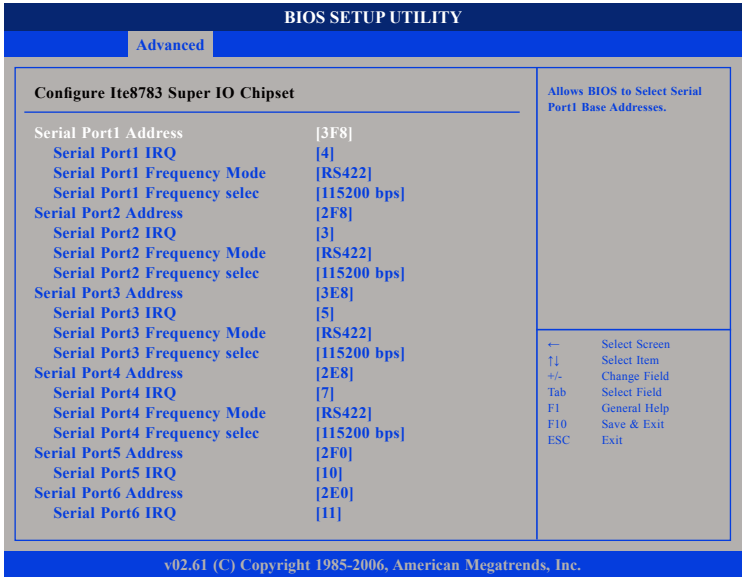
Selects the ACPI state used for system suspend, S1 (POS) enables the Power On Suspend function. S3 (STR) enables the Suspend to RAM function.

ACPI APIC support

Enables or disables the motherboard's Advanced Programmable Interrupt Controller (APIC).

Super IO Configuration

This section is used to configure the I/O functions supported by the onboard Super I/O chip.



Serial Port1 Address to Serial Port6 Address

Auto

The system will automatically select an I/O address for the onboard serial port.

3F8, 2F8, 3E8, 2E8, 2F0, 2E0

Allows you to manually select an I/O address for the onboard serial port.

Disabled

Disables the onboard serial port.

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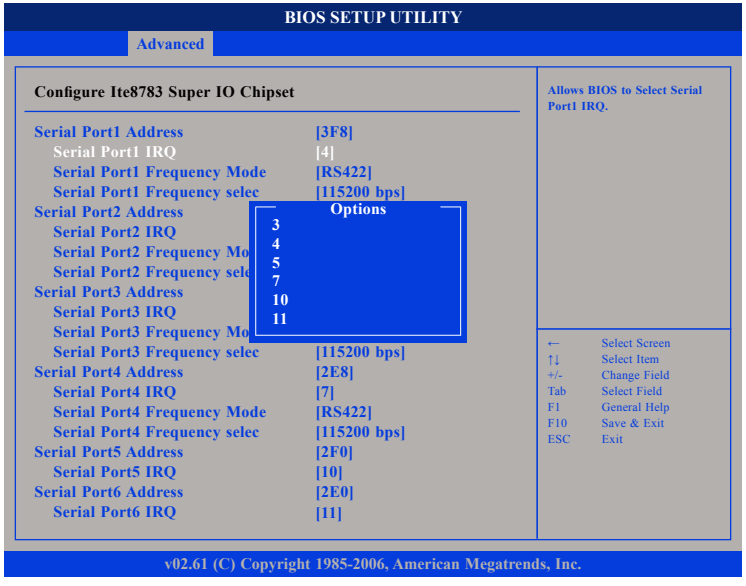
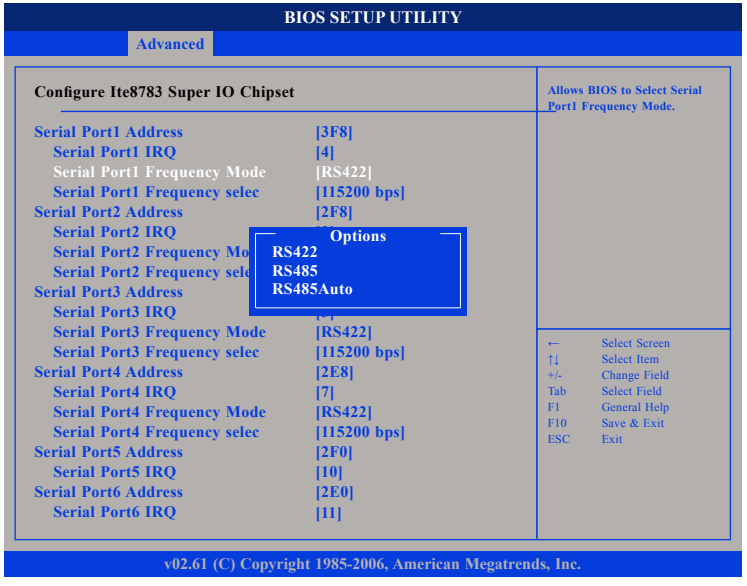
Serial Port1 IRQ to Serial Port6 IRQ

These fields are used to select an IRQ for the onboard serial port 1, 2, 3, 4, 5 or 6. The options are 3, 4, 5, 7, 10 and 11.



Serial Port1 to Serial Port4 Frequency Mode

This field is used to select the frequency mode of serial port 1, 2, 3 and 4. The options are RS422, RS485 and RS485Auto.



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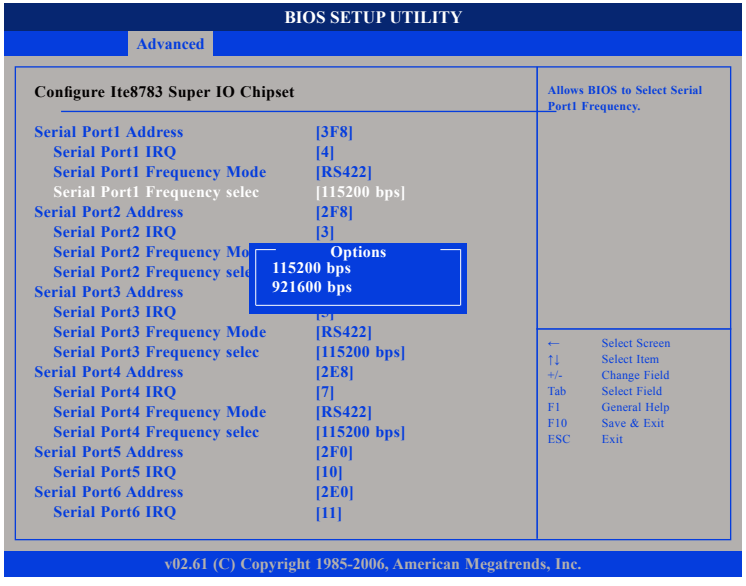
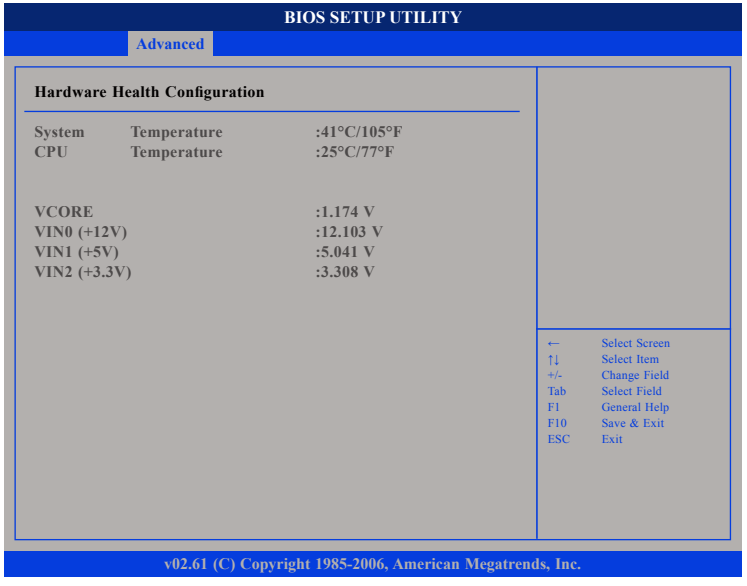
Serial Port1 to Serial Port4 Frequency Select

This field is used to select the frequency (baud rate) of serial port 1, 2, 3 and 4. The options are 115200 bps and 921600 bps.



Hardware Health Configuration

This section is used to monitor hardware status such as temperature, fan speed and voltages.



CPU Temperature and System Temperature

Detects and displays the current temperature of the CPU and the internal temperature of the system.

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Vcore
Detects and displays the Vcore CPU voltage.

VIN0 (+12V)
Detects and displays 12V voltage.

VIN1 (+5V)
Detects and displays 5V voltage.

VIN2 (+3.3V)
Detects and displays 3.3V voltage.

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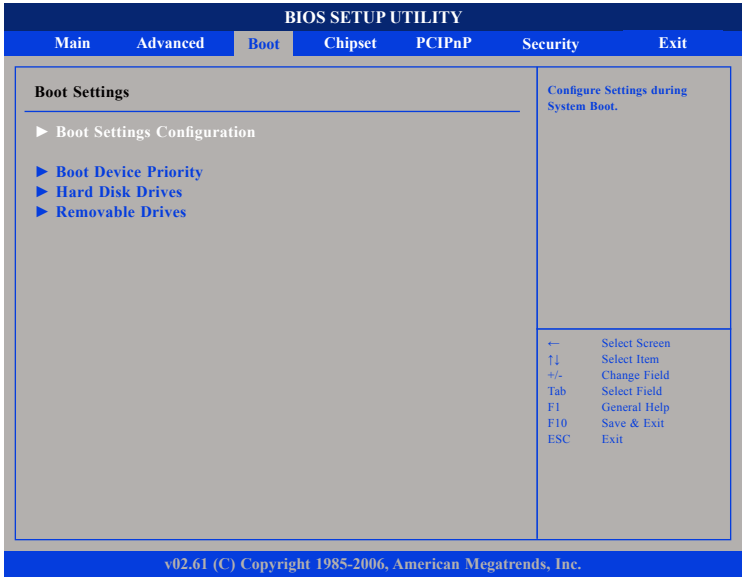
Boot



Boot Settings Configuration

This section is used to configure settings during system boot.

Boot Device Priority

This section is used to select the boot priority sequence of the devices.

Hard Disk Drives

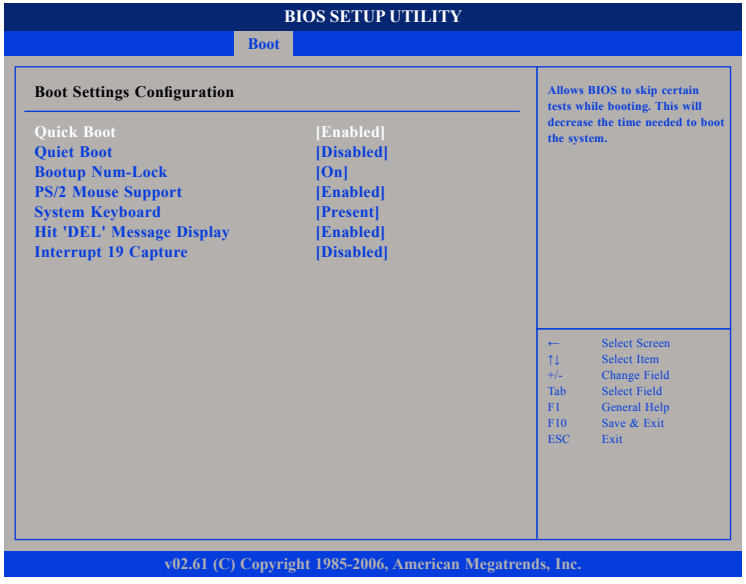
This section is used to select the boot priority sequence of the hard drives.

Removable Drives

This section is used to select the boot priority sequence of the removable drives.

Boot Settings Configuration

This section is used to configure settings during system boot.



Quick Boot

When Enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

Quiet Boot

Enabled	Displays OEM logo instead of the POST messages.
Disabled	Displays normal POST messages.

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Bootup Num-Lock
This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

PS/2 Mouse Support
The options are Auto, Enabled and Disabled.

System Keyboard
Detects the system keyboard.

Hit 'DEL' Message Display
When enabled, the system displays the "Press DEL to run Setup" message during POST.

Interrupt 19 Capture
When enabled, it allows the optional ROM to trap interrupt 19.

Boot Device Priority
This section is used to select the boot priority sequence of the devices.

1st Boot Device to 2nd Boot Device
Selects the drive to boot first, and second in the "1st Boot Device" and "2nd Boot Device" fields respectively. The BIOS will boot the operating system according to the sequence of the drive selected.

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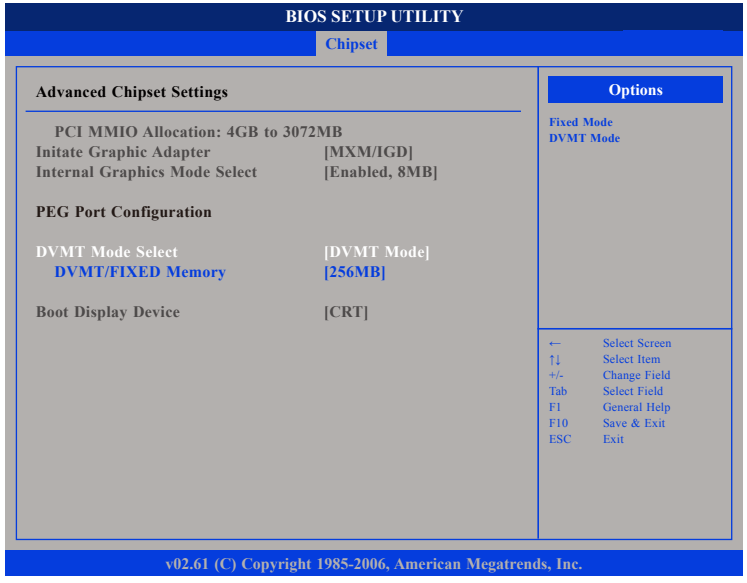
Chipset

This section is used to configure the system based on the specific features of the chipset.

North Bridge Configuration

This section is used to configure the north bridge features.



DVMT Mode Select

The options are Fixed mode and DVMT mode.

DVMT/Fixed Memory

This field is used to select the graphics memory size used by DVMT/Fixed mode.

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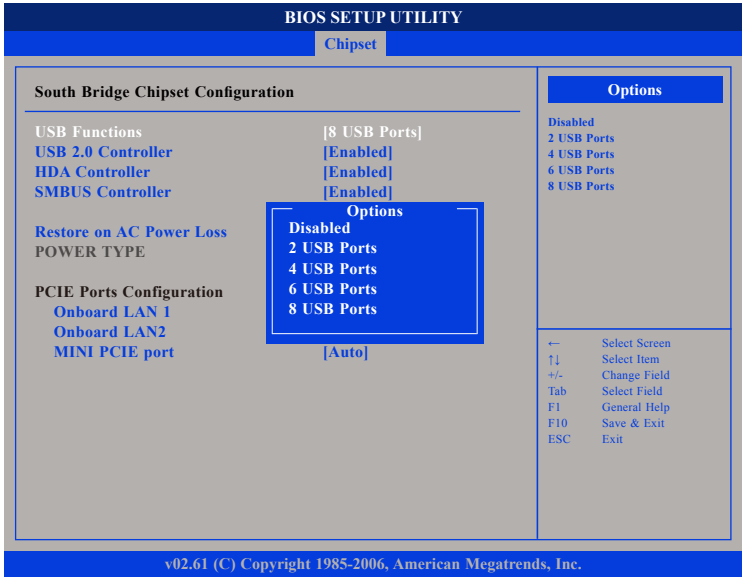
South Bridge Configuration

This section is used to configure the south bridge features.



USB Functions

Enables or disables USB devices.

USB 2.0 Controller

This field is used to enable or disable the Enhanced Host Controller Interface (USB 2.0).

HDA Controller

Enables or disables the onboard audio.

SMBUS Controller

Enables or disables the SMBUS.

Restore On AC Power Loss

Power Off	When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.
Power On	When power returns after an AC power failure, the system will automatically power-on.
Last State	When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Onboard LAN 1 to Onboard LAN 2

Enables or disables the onboard LAN 1 and LAN 2 controllers.

MINI PCIE Port

Enables or disables the mini PCIe controller.

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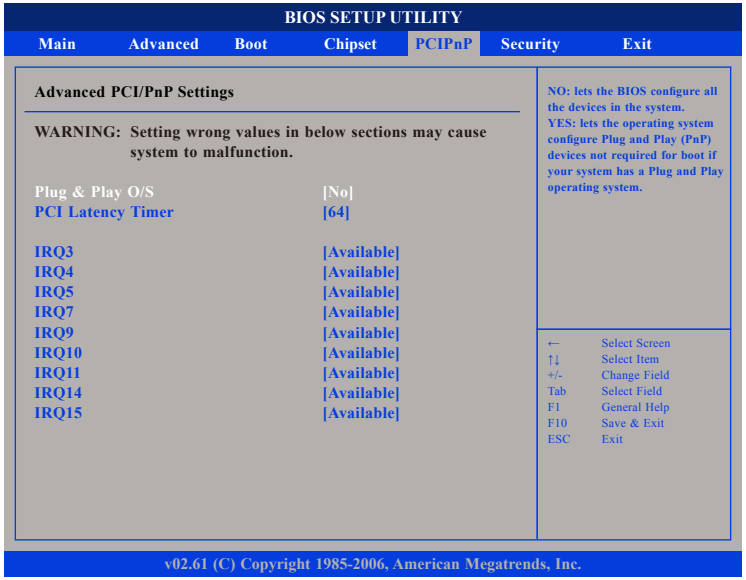
PCIPnP

This section is used to configure settings for PCI/PnP devices.



Plug & Play O/S

Yes Configures Plug and Play (PnP) devices that are not required to boot in a Plug and Play supported operating system.

No The BIOS configures all the devices in the system.

PCI Latency Timer

This feature is used to select the length of time each PCI device will control the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Since each access to the bus comes with an initial delay before any transaction can be made, low values for the PCI Latency Timer will reduce the effectiveness of the PCI bandwidth while higher values will improve it.

IRQ3 to IRQ15

Available The specified IRQ is available for PCI/PnP devices.

Reserved The specified IRQ is reserved for Legacy ISA devices.

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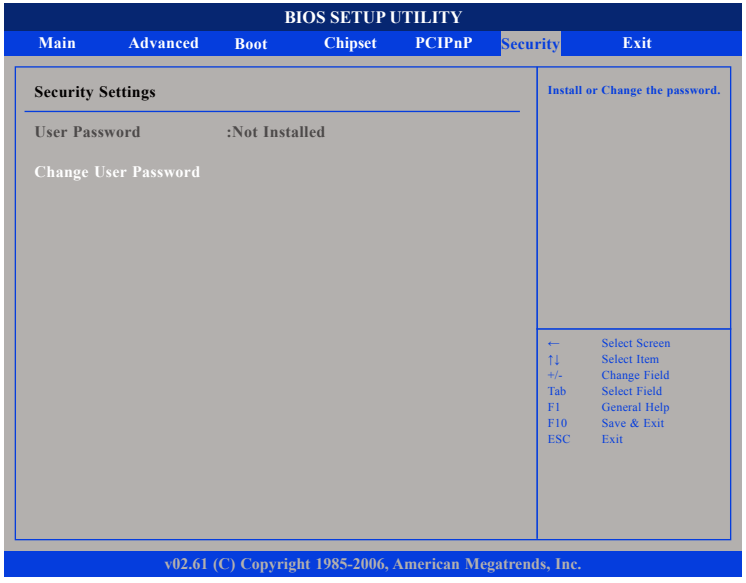
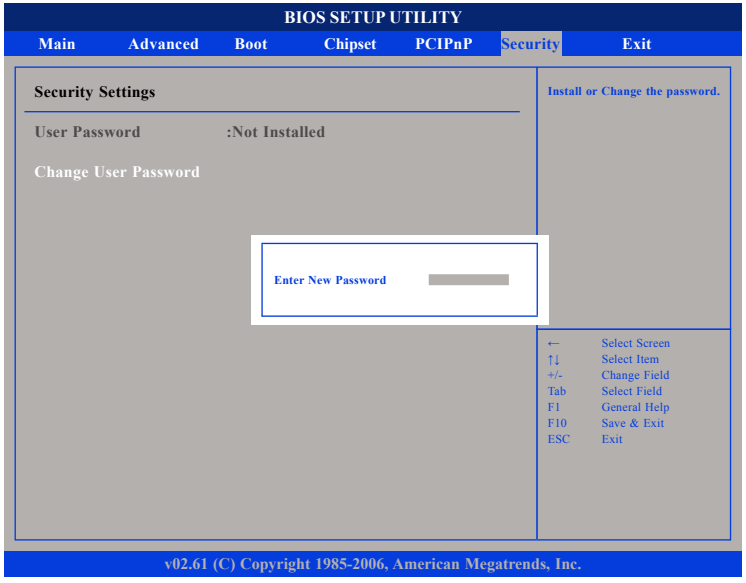
Security





Change User Password

This field is used to set or change the user password.

To set a new password:

1. Select the Change User Password field then press <Enter>.
2. Type your password in the dialog box then press <Enter>. You are limited to eight letters/numbers.
3. Press <Enter> to confirm the new password.
4. When the Password Installed dialog box appears, select OK.

To change the password, repeat the same steps above.

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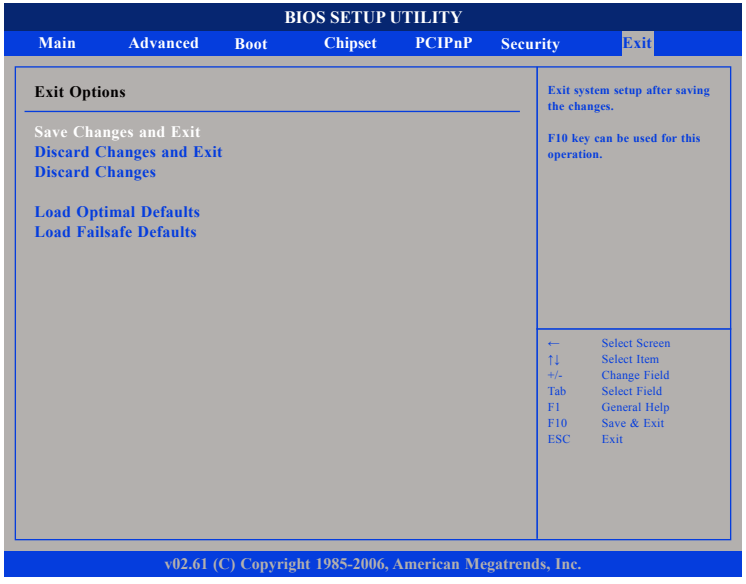
Exit



Save Changes and Exit
To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F10> to save and exit Setup.

Discard Changes and Exit
To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Discard Changes
To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes to discard all changes made and restore the previously saved settings.

Load Optimal Defaults
Loads the optimal default values from the BIOS ROM.

Load Failsafe Defaults
Loads the fail-safe default values from the BIOS ROM.

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Appendix A: Power Consumption

Test Configuration

System Configuration	Sys#1
Chassis	CHASSIS nTUF600 VER:B
CPU	Intel® Atom™ processor D525 (1M Cache, 1.80 GHz)
Memory	ADATA 2GB DDR2 800MHz SODIMM
HDD	SSD 16GB TYPE: SLC Apacer (AP-SAFD254QA016GS-ETH)
FDD	N/A
DVD-ROM	8x DVD±R/RW (DV-W28SS)
CFast	Apacer CFast 16GB (81.3G040,DB30B)
Power Supply	POWER ADAPTER FSP180-AAAN1
Add-on Card	3.5G module PCI-E Mini Card SIERRA WIRELESS:MC8790V
CPU Cooler	ICES 253 CPU HEATSINK
System FAN	N/A
Keyboard	LEMEL B-5201-P
Mouse	GENIVS EASY MOUSE USB

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Power Consumption Management

Purpose

The purpose of the power consumption test is to verify the power dissipation of system, and the loading of power supply.

Test Equipment

PROVA CM-07 AC/DC CLAMP METER

Device Under Test

DUT: sys#1/

Test Procedure

1. Power up the DUT, boot into Windows XP SP3
2. Entering standby mode (HDD power down)
3. Measure the power consumption and record it.
4. Run Burn-in test program to apply 100% full loading
5. Measure the power consumption and record it.

Test Data

	Sys #1
	+24V
Full-Loading Mode	1.53A
Total	36.72W
Standby S3Mode	0.18A
Total	4.32W

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Appendix B: GPI/O Programming Guide

GPI/O (General Purpose Input/Output) pins are provided for custom system design. This appendix provides definitions and its default setting for the ten GPI/O pins in the NTUF-600 series. The pin definition is shown in the following table:

GPI/O mode	PowerOn Default	Address	GPI/O mode	PowerOn Default	Address
GPO0	Low	284h (Bit4)	GPI0	High	284h (Bit0)
GPO1	Low	284h (Bit5)	GPI1	High	284h (Bit1)
GPO2	Low	284h (Bit6)	GPI2	High	284h (Bit2)
GPO3	Low	284h (Bit7)	GPI3	High	284h (Bit3)

Control the GPO pins level from I/O port 284h bit (4/5/6/7).
The bit is Set/Clear indicated output High/Low

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GPIO programming sample code

```
#define GPIO_PORT       0x284
#define GPO3                    (0x01 << 4)
#define GPO5                    (0x01 << 5)
#define GPO7                    (0x01 << 6)
#define GPO9                    (0x01 << 7)

#define GPO3_HI         outportb(GPIO_PORT, 0x10)
#define GPO3_LO                 outportb(GPIO_PORT, 0x00)
#define GPO5_HI         outportb(GPIO_PORT, 0x20)
#define GPO5_LO                 outportb(GPIO_PORT, 0x00)
#define GPO7_HI         outportb(GPIO_PORT, 0x40)
#define GPO7_LO                 outportb(GPIO_PORT, 0x00)
#define GPO9_HI         outportb(GPIO_PORT, 0x80)
#define GPO9_LO                 outportb(GPIO_PORT, 0x00)
void main(void)
{
  GPO3_HI;
  GPO5_LO;
  GPO7_HI;
  GPO9_LO;
}
```

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Appendix C: Watchdog Timer Setting

ITE8783 WatchDog Programming Guide

```
#define SUPERIO_PORT    0x2E
#define WDT_SET         0x72
#define WDT_VALUE 0x73

void main(void)
{
  #Enter SuperIO Configuration
        outportb(SUPERIO_PORT, 0x87);
        outportb(SUPERIO_PORT, 0x01);
        outportb(SUPERIO_PORT, 0x55);
        outportb(SUPERIO_PORT, 0x55);

  # Set LDN
        outportb(SUPERIO_PORT,0x07);
        outportb(SUPERIO_PORT+1 ,0x07);

  # Set WDT setting
        outportb(SUPERIO_PORT, WDT_SET);
        outportb(SUPERIO_PORT+1 , 0xC0);
# Use the Second to come down
        # If choose the Minute, change value to 0x40

  # Set WDT sec/min
        outportb(SUPERIO_PORT, WDT_VALUE);
        outportb(SUPERIO_PORT+1 , 0x05);          #Set 5 seconds
}
```

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