IEI Integration Corp.

MODEL:

TANK-600 Series

Fanless Embedded System with Intel® Dual Core D2550 1.86 GHz processor / Intel® Dual Core N2600 1.6 GHz processor, VGA, Two Gigabit Ethernet, Six USB 2.0, RS-232/422/485, RoHS Compliant

User Manual

Rev. 1.03 – 28 July 2017

RoHS Lead Free

Revision

Date	Version	Changes
28 July 2017	1.03	Add Manual Conventions Add Section 3.1.1: High Surface Temperature Updated Section 3.5: Mounting the System
7 June 2013	1.02	Add Section 3.5: Mounting the System with Mounting Brackets
24 May 2013	1.01	Update power input in spec.
7 April 2013	1.00	Initial release

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Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: TANK-600

The TANK-600 is a fanless embedded system for wide range temperature environments. It is powered by the Intel® dual core D2550 1.86 GHz processor for TANK-600-D2550 or Intel® dual core N2600 1.6 GHz processor for TANK-600-N2600. It has 4.0 GB of DDR3 memory on-board for TANK-600-D2550 and 2.0 GB of DDR3 memory on-board for TANK-600-N2600. The TANK-600 series includes one VGA port, two GbE LAN ports, six USB 2.0 ports, six RS-232 connectors via DB-9, two RS-232/422/485 connectors via DB-9 and eight RS-232 connectors via DB-78 (optional).

1.2 Model Variations

The model variations of the TANK-600 series are listed below.

Model No.	CPU	Memory
TANK-600-CV-D2550	Intel® dual core D2550 1.86 GHz processor	4G DDR3 RAM onboard
TANK-600-CV-N2600	Intel® dual core N2600 1.6 GHz processor	2G DDR3 RAM onboard

Table 1-1: TANK-600 Model Variations

1.3 Features

The TANK-600 features are listed below:

- Intel® dual core™ D2550 1.86 GHz processor
  Intel® dual core™ N2600 1.6 GHz processor
- Default : 8 x COM ports (6 x RS-232, 2 x RS-232/422/485)
- Optional: 8 x COM ports via DB-78 (8 x RS-232)
- 6 x USB2.0
- Dual PCIe GbE LAN for high speed network applications

1.4 Technical Specifications

The TANK-600 technical specifications are listed in **Table 1-2**.

Specifications	
Chassis	
Color	Black C + Silver
Dimension (WxDxH)	200 x 193.4 x 57 mm
System Fan	Fanless
Chassis Construction	Aluminum alloy
Motherboard	
CPU	Intel® dual core™ D2550 1.86 GHz processor (TANK-600-CV-D2550) Intel® dual core™ N2600 1.6 GHz processor (TANK-600-CV-N2600)
Chipset	Intel® NM10
System Memory	On-board DDR3 4GB (TANK-600-CV-D2550) On-board DDR3 2GB (TANK-600-CV-N2600)
Storage	
Hard Drive	1 x 2.5” SATA HDD Bay

Specifications	
I/O interfaces	
USB 2.0	6 x USB2.0
Ethernet	2 x RJ-45 Realtek 8111E GbE LAN
RS-232	Default: 6 x DB-9 Optional: 8 x RS-232 by DB-78
RS-232/422/485	2 x DB-9
Display	1 x VGA
Resolution	Up to 2048 x 1536 @ 75Hz
Audio	1 x Line-out, 1 x Mic-in
Expansions	
PCIe Mini	1 x Full Size (Support mSATA) 1 x Half Size
Power	
Power Input	DC Jack: 9~36V DC
Power Consumption	12V @ 2.1A
Reliability	
Mounting	VESA 100, DIN-Rail
Operating Temperature	-20°C ~ 70°C with air flow
Operating Shock	Half-sine wave shock 5G, 11ms, 3 shocks per axis
Operating Vibration	MIL-STD-810F 514.5C-2 (with SSD)
Weight (Net/Gross)	2.2 Kg / 3 Kg
Safety/EMC	CE / FCC
OS	
Supported OS	Microsoft® WES7E, Microsoft® Windows® XP Embedded

Table 1-2: Technical Specifications

1.5 Front Panel

The front panel of the TANK-600 has the following features (**Figure 1-2**):

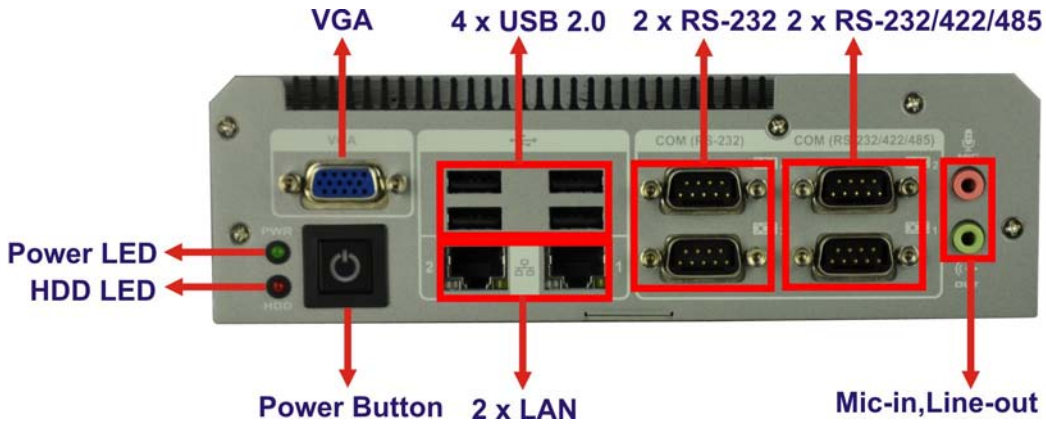


Figure 1-2: TANK-600 Front Panel

Connectors and buttons on the front panel include the following:

- 1 x HDD LED
- 2 x LAN ports by RJ-45
- 1 x Line-out port (green)
- 1 x Mic-in port (pink)
- 1 x Power button
- 1 x Power LED
- 2 x RS-232 serial ports by DB-9
- 2 x RS-232/422/485 serial ports by DB-9
- 4 x USB 2.0 ports
- 1 x VGA port

1.6 Rear Panel

The rear panel of the TANK-600 has the following features (**Figure 1-2**):

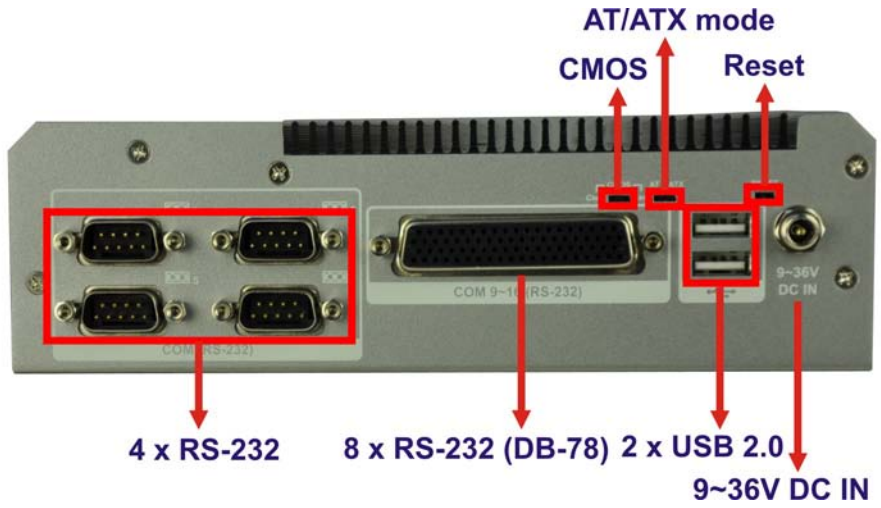


Figure 1-3: TANK-600 Rear Panel

Connectors and buttons on the front panel include the following:

- 1 x 9 V ~ 36 V DC IN
- 1 x AT/ATX mode switch
- 1 x CMOS switch
- 1 x Reset button
- 4 x RS-232 serial ports by DB-9
- 8 x RS-232 serial ports by DB-78 (Optional)
- 2 x USB 2.0 ports

1.7 Dimensions

The physical dimensions are shown below:

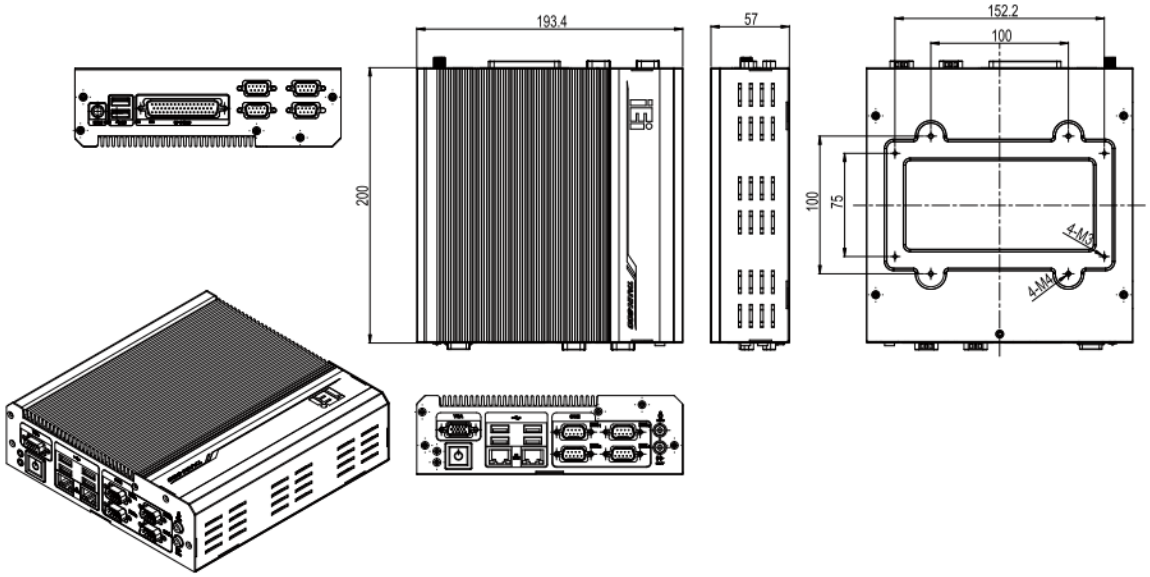


Figure 1-4: Physical Dimensions (millimeters)

Chapter

2

Unpacking

2.1 Unpacking

To unpack the embedded system, follow the steps below:

Step 1: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the external (second) box.

Step 2: Open the external (second) box.

Step 3: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the internal (first) box.

Step 4: Lift the system out of the boxes.

Step 5: Remove both polystyrene ends, one from each side.

Step 6: Make sure all the components listed in the packing list are present.

2.2 Packing List

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the TANK-600 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The TANK-600 is shipped with the following components:

Quantity	Item and Part Number	Image
Standard		
1	TANK-600	

Quantity	Item and Part Number	Image
Standard		
1	Power Adapter (**P/N**: 63040-010065-010-RS)	
1	Power Cord (**P/N**: 32702-000200-100-RS)	
4	Bracket Screws (M3*6) (**P/N**: 44003-030062-RS)	
2	Mounting Brackets	
4	Wall Mounting Bracket Screws (M030*05) (**P/N**: 44043-030051-RS)	
1	One Key Recovery CD (**P/N**: 7B000-000724-RS)	
1	Utility CD	

Table 2-1: Package List

2.3 Optional Items

The following table lists the optional items that can be purchased separately.

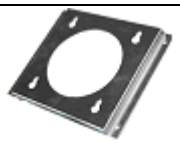
Optional	
DB-78 cable	
VESA 100 mount kit	
DIN-rail mount (**P/N**: DK-84MB)	

Table 2-2: Optional Items

Chapter

3

Installation

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the maintenance of the TANK-600 may result in permanent damage to the TANK-600 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-600. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-600 is accessed internally, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: - When configuring the TANK-600, place it on an antic-static pad. This reduces the possibility of ESD damaging the TANK-600.
- ***Only handle the edges of the PCB***: - When handling the PCB, hold the PCB by the edges.

3.1.1 High Surface Temperature

WARNING:

Some surfaces of the equipment may become hot during operation.

The surface temperature may be up to several tens of degrees hotter than the ambient temperature. Under these circumstances, the equipment needs to be protected against accidental contact.

The equipment is intended for installation in a RESTRICTED ACCESS LOCATION.

- Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

3.2 Installation Precautions

When installing the TANK-600, please follow the precautions listed below:

- **Power turned off**: When installing the TANK-600, make sure the power is off. Failing to turn off the power may cause severe injury to the body and/or damage to the system.
- **Certified Engineers**: Only certified engineers should install and modify onboard functionalities.
- **Anti-static Discharge**: If a user open the bottom panel of the TANK-600, to configure the jumpers or plug in added peripheral devices, ground themselves first and wear and anti-static wristband.

3.3 Installation and Configuration Steps

The following installation steps must be followed.

Step 1: Unpack the system.

Step 2: Install a HDD.

Step 3: Connect peripheral devices.

Step 4: Mount the system.

Step 5: Power up the system.

3.4 Hard Disk Drive (HDD) Installation

To install the hard drive, please follow the steps below:

Step 1: Remove five retention screws from the rear panel, as shown in **Figure 3-1**.

Figure 3-1: Remove Retention Screws (Rear Panel)

Step 2: Remove five retention screws from the bottom panel, as shown in **Figure 3-2**.

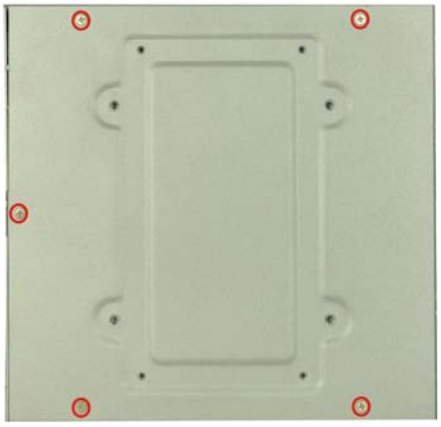


Figure 3-2: Remove Retention Screws (Bottom Panel)

Step 3: Remove ten hex head screws on either side of the connectors from the rear panel, as shown in **Figure 3-3**.

Figure 3-3: Remove Hex Head Screws (Rear Panel)

Step 4: Remove the bottom cover from the device.

Step 5: Remove the four HDD bracket retention screws (**Figure 3-4**).

Figure 3-4: HDD Bracket Retention Screws

Step 6: Lift the HDD bracket out of the TANK-600.

Step 7: Slide the HDD to the HDD bracket and secure the HDD to the HDD bracket using four retention screws (**Figure 3-5**).

Figure 3-5: Inserting the HDD

Step 8: Install the HDD bracket in the same position it was before and fasten the HDD bracket retention screws.

Step 9: Reinstall the bottom cover.

3.5 Mounting the System

3.5.1 Mounting the System with Mounting Brackets

To mount the embedded system onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the embedded system to the bottom panel.

Step 2: Align the two retention screw holes in each bracket with the corresponding retention screw holes on the bottom panel (**Figure 3-6**).

Figure 3-6: Mounting Bracket Retention Screws

Step 3: Secure the brackets to the system by inserting two retention screws (M3*6, **P/N**: 44003-030062-RS) into each bracket (**Figure 3-6**).

Step 4: Drill holes in the intended installation surface.

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert four retention screws, two in each bracket, to secure the system to the wall.

3.5.2 Mounting the System with Wall Mount Kit (Optional)

To mount the embedded system onto a wall using the VESA MIS-D 100 wall mount kit, please follow the steps below.

Step 1: Select the location on the wall for the wall-mounting bracket.

Step 2: Carefully mark the locations of the four bracket screw holes on the wall.

Step 3: Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 4: Align the wall-mounting bracket screw holes with the pilot holes.

Step 5: Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 3-7**).

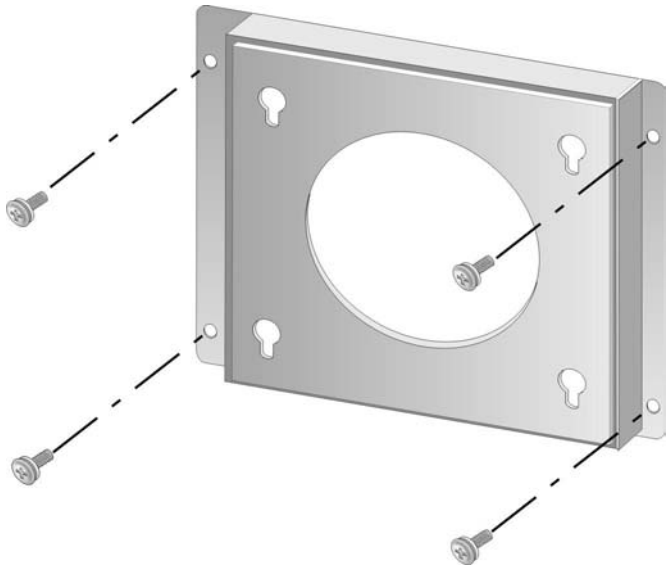


Figure 3-7: Wall-mounting Bracket

Step 6: Insert the four monitor mounting screws (M030*05, **P/N**: 44043-030051-RS) provided in the wall mounting kit into the four screw holes on the bottom panel of the system and tighten until the screw shank is secured against the bottom panel (**Figure 3-8**).

Step 7: Align the mounting screws on the TANK-600 bottom panel with the mounting holes on the bracket.

Step 8: Carefully insert the screws through the holes and gently pull the monitor downwards until the TANK-600 rests securely in the slotted holes (**Figure 3-8**). Ensure that all four of the mounting screws fit snuggly into their respective slotted holes.

NOTE:

In the diagram below the bracket is already installed on the wall.

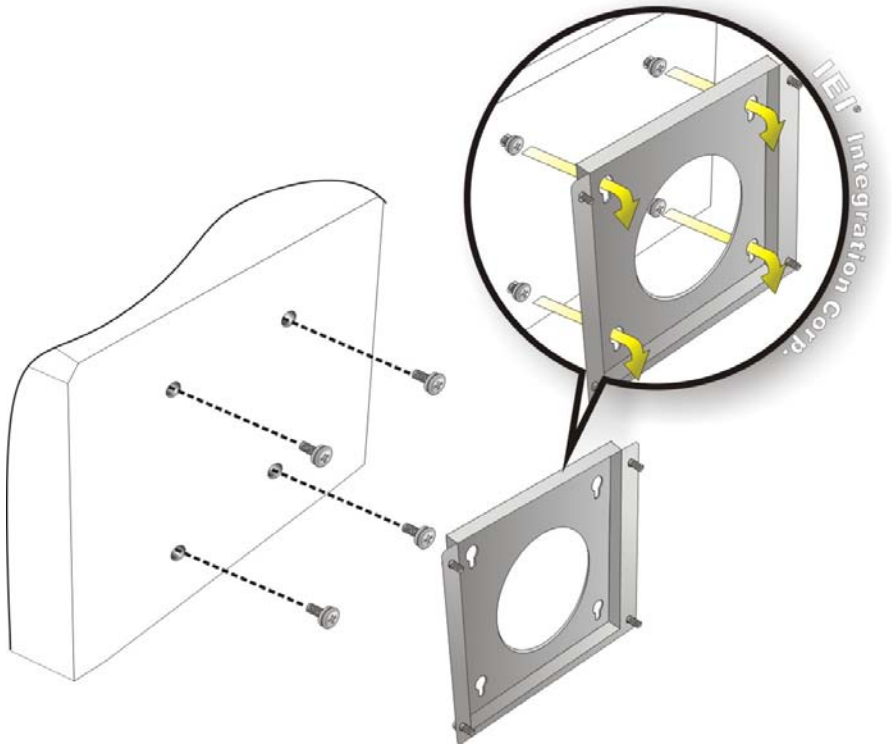


Figure 3-8: Mount the Embedded System

3.6 AT/ATX Mode Selection

AT or ATX power mode can be used on the TANK-600. The selection is made through an AT/ATX switch located on the bottom panel. To select AT mode or ATX mode, follow the steps below.

Step 1: Locate the AT/ATX switch on the bottom panel (**Figure 3-9**).

Figure 3-9: AT/ATX Switch Location

Step 2: Adjust the AT/ATX switch.

3.6.1 AT Power Mode

With the AT mode selected, the power is controlled by a central power unit rather than a power switch. The TANK-600 system turns on automatically when the power is connected. The AT mode benefits a production line to control multiple systems from a central management center and other applications including:

- ATM
- Self-service kiosk
- Plant environment monitoring system
- Factory automation platform
- Manufacturing shop flow

3.6.2 ATX Power Mode

With the ATX mode selected, the TANK-600 system goes in a standby mode when it is turned off. The system can be easily turned on via network or a power switch in standby mode. Remote power control is perfect for advertising applications since the broadcasting time for each system can be set individually and controlled remotely. Other possible application includes

- Security surveillance
- Point-of-Sale (POS)
- Advertising terminal

3.7 Clear CMOS

If the TANK-600 fails to boot due to improper BIOS settings, the clear CMOS switch clears the CMOS data and resets the system BIOS information. To do this, adjust the clear CMOS switch to clear CMOS mode for a few seconds then reinstall the clear CMOS switch back to keep CMOS mode.

Step 1: Locate the clear CMOS switch on the bottom panel (**Figure 3-10**).

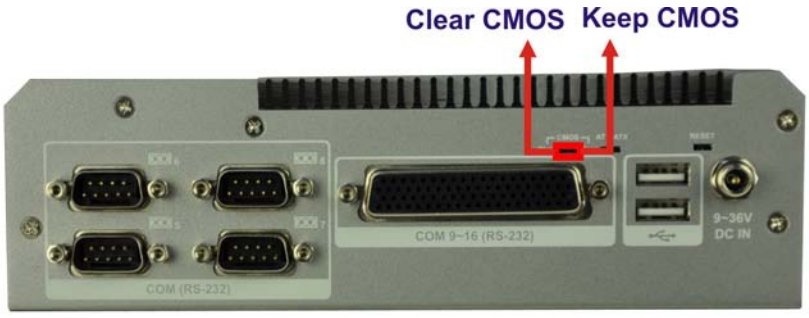


Figure 3-10: Clear CMOS Switch Location

Step 2: Adjust the clear CMOS switch.

3.8 Reset the System

The reset button enables user to reboot the system when the system is turned on. To reboot the system, follow the steps below.

Step 1: Locate the reset button on the bottom panel (**Figure 3-11**).

Figure 3-11: Reset Button Location

Step 2: Press the reset button.

3.9 Powering On/Off the System

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

- **Power on** the system: press the power button for 3 seconds
- **Power off** the system: press the power button for 6 seconds

Figure 3-12: Power Button

3.10 External Peripheral Device Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio devices
- RJ-45 Ethernet cable
- Serial port devices
- USB devices
- VGA monitor

To install these devices, connect the corresponding cable connector from the actual device to the corresponding TANK-600 external peripheral interface connector making sure the pins are properly aligned.

3.10.1 Audio Connection

The audio jacks on the external audio connector enable the TANK-600 to be connected to a stereo sound setup. To install the audio devices, follow the steps below.

Step 1: **Identify the audio plugs**. The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

Step 2: **Plug the audio plugs into the audio jacks**. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

- **Line Out port (Lime):** Connects to a headphone or a speaker.
- **Microphone (Pink):** Connects to a microphone.

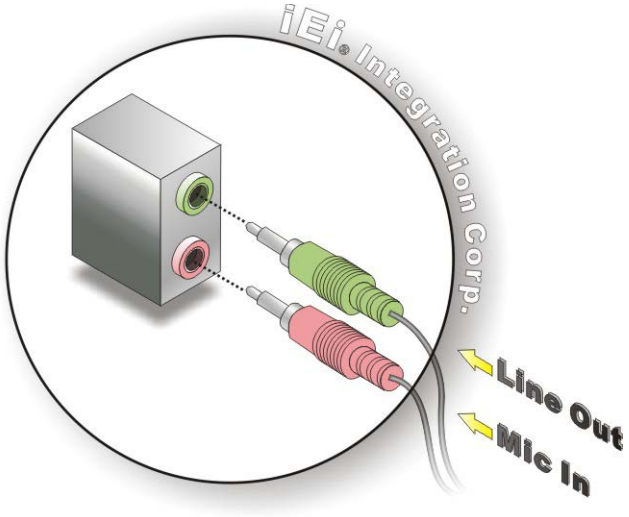


Figure 3-13: Audio Connector

Step 3: **Check audio clarity**. Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

3.10.2 LAN Connection

There are two external RJ-45 LAN connectors on the TANK-600. The RJ-45 connector enables connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors.** The location of the LAN connector is shown in **Chapter 1**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the TANK-600. See **Figure 3-14**.

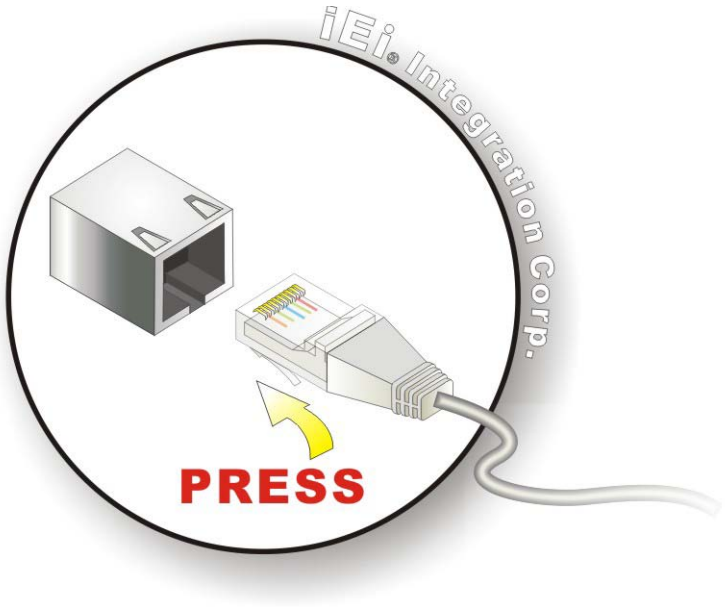


Figure 3-14: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the external interface.

3.10.3 Serial Device Connection

There are six RS-232 connectors via DB-9, two RS-232/422/485 connectors via DB-9 and eight RS-232 connectors via DB-78 (optional) for serial device connection. Follow the steps below to connect a serial device to the TANK-600.

3.10.3.1 DB-9 Serial Port Connection

Follow the steps below to connect a serial device to the DB-9 connector of the TANK-600 system.

Step 1: **Locate the DB-9 connector**. The locations of the DB-9 connectors are shown in **Chapter 1**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the bottom panel. See **Figure 3-15**.

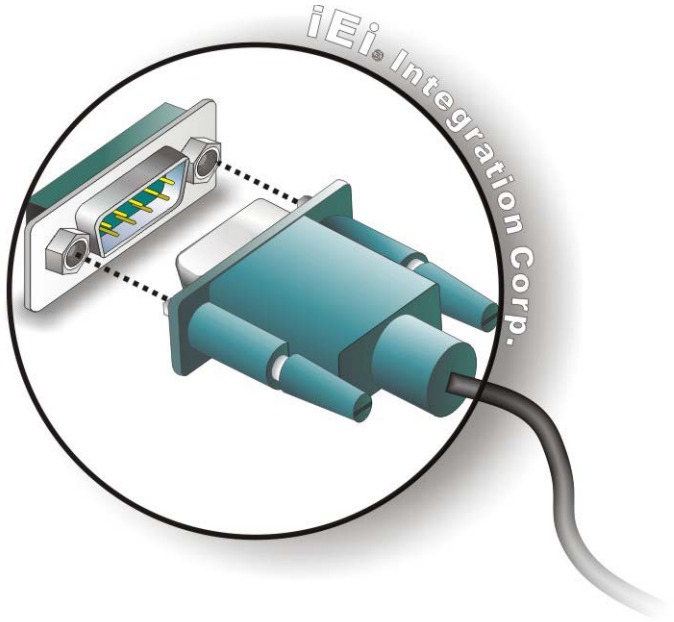


Figure 3-15: DB-9 Serial Port Connection

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

3.10.3.2 DB-78 Serial Port Connection (Optional)

Follow the steps below to connect a serial device to the DB-78 serial port connector of the TANK-600 system.

Step 1: **Locate the DB-78 serial port**. The location of the DB-78 serial port is shown in **Chapter 1**.

Step 2: **Connect the DB-78 to COM port cable to the system**. Insert the DB-78 connector end of cable into the DB-78 serial port. See **Figure 3-16**.

Figure 3-16: DB-78 to COM port cable

Step 3: **Connect the serial device.** Connect a serial device to the DB-9 connector end of the cable. See **Figure 3-15**.

Step 4: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

3.10.4 USB Device Connection

There are six USB 2.0 connectors on the TANK-600. To connect a USB device, please follow the instructions below.

Step 1: **Locate the USB connectors**. The locations of the USB connectors are shown in **Chapter 1**.

Step 2: **Align the connectors.** Align the USB device connector with one of the connectors on the TANK-600. See **Figure 3-17**.

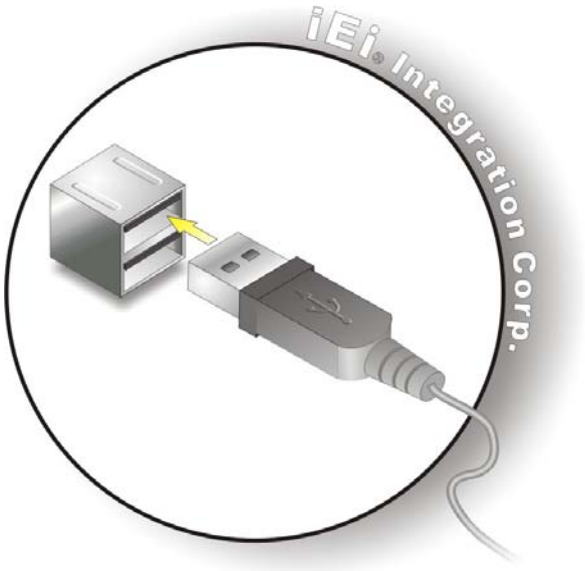


Figure 3-17: USB Device Connection

Step 3: **Insert the device connector.** Once aligned, gently insert the USB device connector into the onboard connector.

3.10.5 VGA Monitor Connection

The TANK-600 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the TANK-600, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 1**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the TANK-600. See **Figure 3-18**.

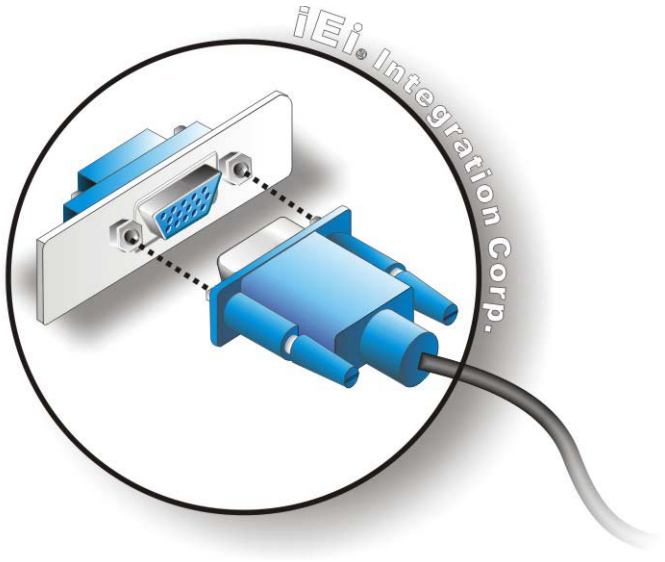


Figure 3-18: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

Chapter

4

System Motherboard

4.1 Overview

This chapter details all the jumpers and connectors of the system motherboard.

4.1.1 Layout

The figures below show all the connectors and jumpers of the system motherboard. The Pin 1 locations of the on-board connectors are also indicated in the diagram below.

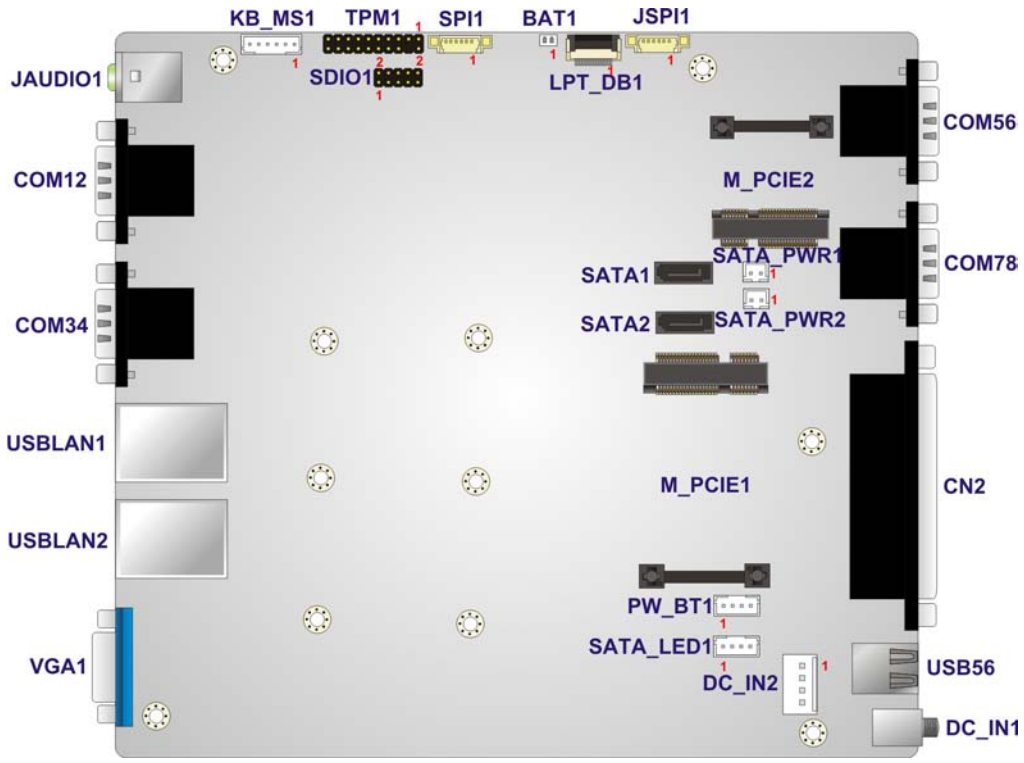


Figure 4-1: System Motherboard

4.2 Internal Peripheral Connectors

The table below shows a list of the internal peripheral interface connectors on the system motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Battery connector	2-pin wafer	BAT1
BIOS programming connector	6-pin wafer	SPI1

Connector	Type	Label
Digital I/O connector	10-pin header	SDIO1
EC Debug connector	20-pin wafer	LPT_DB1
EC programming connector	6-pin wafer	JSPI1
Keyboard/mouse connector	6-pin wafer	KB_MS1
PCIe Mini card slot	PCIe Mini card slot	M_PCIE1, M_PCIE2
Power button connector	4-pin wafer	PW_BT1
Power connector	4-pin wafer	DC_IN2
SATA 3Gb/s drive connectors	7-pin SATA connector	SATA1, SATA2
SATA power connector	2-pin wafer	SATA_PWR1, SATA_PWR2
SATA LED connector	4-pin wafer	SATA_LED1
TPM connector	20-pin header	TPM1

Table 4-1: Peripheral Interface Connectors

4.2.1 Battery Connector (BAT1)

PIN NO.	DESCRIPTION
1	+VBAT
2	GND

Table 4-2: Battery Connector Pinouts (BAT1)

4.2.2 BIOS Programming Connector (SPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V3.3A_SPI	2	SPI_2N_CS#
3	SPI_2N_MISO	4	SPI_2N_CLK
5	SPI_2N_MOSI	6	GND

Table 4-3: BIOS Programming Connector Pinouts (SPI1)

4.2.3 Digital I/O Connector (SDIO1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	DGPO3	4	DGPO2
5	DGPO1	6	DGPO0
7	DGPI3	8	DGPI2
9	DGPI1	10	DGPI0

Table 4-4: Digital I/O Connector Pinouts (SDIO1)

4.2.4 EC Debug Connector (LPT_DB1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_KSI0	2	EC_KSO0
3	EC_KSO1	4	EC_KSO2
5	EC_KSO3	6	EC_KSO4
7	EC_KSO5	8	EC_KSO6
9	EC_KSO7	10	EC_KSO8
11	EC_KSO9	12	EC_KSO10
13	EC_KSO12	14	EC_KSI1
15	EC_KSO11	16	EC_KSI2
17	EC_KSI3	18	GND
19	GND	20	GND

Table 4-5: EC Debug Connector Pinouts (LPT_DB1)

4.2.5 EC Programming Connector (JSPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPI_VCC	2	FSCE#_S
3	FMISO_S	4	FSCK_S
5	FMOSI_S	6	GND

Table 4-6: EC Programming Connector Pinouts (JSPI1)

4.2.6 Keyboard/Mouse Connector (KB_MS1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Power	2	MSDATA_T
3	MSCLK_T	4	KBDATA_T
5	KBCLK_T	6	GND

Table 4-7: Keyboard/Mouse Connector Pinouts (KB_MS1)

4.2.7 Power Button Connector (PW_BT1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWRBTN_SW#	2	GND
3	GND	4	POWER (3.3V)

Table 4-8: Power Button Connector Pinouts (PW_BT1)

4.2.8 Power Connector (DC_IN2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	DC_IN	4	DC_IN

Table 4-9: Power Connector Pinouts (DC_IN2)

4.2.9 SATA 3Gb/s Drive Connectors (SATA1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SATA0_T_TX+
3	SATA0_T_TX-	4	GND
5	SATA0_T_RX-	6	SATA0_T_RX+
7	GND		

Table 4-10: SATA 3Gb/s Drive Connectors Pinouts (SATA1)

4.2.10 SATA 3Gb/s Drive Connectors (SATA2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SATA_T_CN_TX+

3	SATA_T_CN_TX-	4	GND
5	SATA_T_CN_RX--	6	SATA_T_CN_RX+
7	GND		

Table 4-11: SATA 3Gb/s Drive Connectors Pinouts (SATA2)

4.2.11 SATA Power Connector (SATA_PWR1, SATA_PWR2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND

Table 4-12: SATA Power Connector Pinouts (SATA_PWR1, SATA_PWR2)

4.2.12 SATA LED Connector (SATA_LED1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	POWER	2	GND
3	SATA_LED	4	POWER

Table 4-13: SATA LED Connector Pinouts (SATA_LED1)

4.2.13 TPM Connector (TPM1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CLK_LPC_HEADER	2	GND
3	LPC_FRAME#	4	NC
5	RST#_LPC	6	+5V
7	LPC_AD3	8	LPC_AD2
9	+3.3V	10	LPC_AD1
11	LPC_AD0	12	GND
13	SMBCLK	14	SMBDATA
15	+V3.3SB	16	INT_SERIRQ
17	GND	18	PM_CLKRUN#
19	PM_SUS_STAT#	20	LPC_DRQ0#

Table 4-14: TPM Connector Pinouts (TPM1)

4.3 External Interface Panel Connectors

The table below shows a list of the external interface panel connectors on the system motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Audio jack (mic, line-out)	Audio jack	JAUDIO1
Ethernet and USB2.0 connectors	RJ-45, USB 2.0 port	USBLAN1, USBLAN2
Power connector	3-pin DC jack	DC_IN1
RS-232/422/485 serial port connectors	DB-9	COM12
RS-232 serial port connectors	DB-9	COM34, COM56,COM78
RS-232 serial port connectors	DB-78	CN2
USB 2.0 connectors	USB 2.0 port	USB56
VGA connector	DB-15	VGA1

Table 4-15: Rear Panel Connectors

4.3.1 Audio Jack (JAUDIO1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	LMIC1-L
3	GND	4	MIC1_JD
5	LMIC1-R	22	LINE_OUTL
23	GND	24	LINE1_JD
25	LINE1_JD		

Table 4-16: Audio Jack Pinouts (JAUDIO1)

4.3.2 Ethernet and USB2.0 Connectors (USBLAN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
P1	NC	P2	LAN1_MDI0+
P 3	LAN1_MDI0-	P 4	LAN1_MDI1+

P 5	LAN1_MDI1-	P 6	LAN1_MDI2+
P 7	LAN1_MDI2-	P 8	LAN1_MDI3+
P 9	LAN1_MDI3-	P 1 0	GND
P 11	LAN1_LED_100M	P 12	LAN1_LED_1000M
P 13	LAN1_LED_ACT	P 14	Power
1	+V5A_IO_USB01	2	USB0_T_D-
3	USB0_T_D+	4	GND
5	+V5A_IO_USB01	6	USB1_T_D-
7	USB1_T_D+	8	GND

Table 4-17: Ethernet and USB2.0 Connectors Pinouts (USBLAN1)

4.3.3 Ethernet and USB2.0 Connectors (USBLAN2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
P1	NC	P2	LAN2_MDI0+
P 3	LAN2_MDI0-	P 4	LAN2_MDI1+
P 5	LAN2_MDI1-	P 6	LAN2_MDI2+
P 7	LAN2_MDI2-	P 8	LAN2_MDI3+
P 9	LAN2_MDI3-	P 1 0	GND
P 11	LAN2_LED_100M	P 12	LAN2_LED_1000M
P 13	LAN2_LED_ACT	P 14	Power
1	+V5A_IO_USB23	2	USB2_T_D-
3	USB2_T_D+	4	GND
5	+V5A_IO_USB23	6	USB3_T_D-
7	USB3_T_D+	8	GND

Table 4-18: Ethernet and USB2.0 Connectors Pinouts (USBLAN2)

4.3.4 Power Connector (DC_IN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DC_IN	2	GND
3	GND		

Table 4-19: Power Connector Pinouts (DC_IN1)

4.3.5 RS-232 Serial Port Connector (COM1)

PIN NO.	RS-232	RS-422	RS-485
1	COM1_DCD#	TXD422#1	TXD485#1
2	COM1_RXD	TXD422+1	TXD485+1
3	COM1_TXD	RXD422+1	NA
4	COM1_DTR#	RXD422#1	NA
5	GND	NA	NA
6	COM1_DSR#	NA	NA
7	COM1_RTS#	NA	NA
8	COM1_CTS#	NA	NA
9	COM1_RI#	NA	NA

Table 4-20: RS-232 Serial Port Connector Pinouts (COM1)

4.3.6 RS-232 Serial Port Connector (COM2)

PIN NO.	RS-232	RS-422	RS-485
1	COM2_DCD#	TXD422#2	TXD485#2
2	COM2_RXD	TXD422+2	TXD485+2
3	COM2_TXD	RXD422+2	NA
4	COM2_DTR#	RXD422#2	NA
5	GND	NA	NA
6	COM2_DSR#	NA	NA
7	COM2_RTS#	NA	NA
8	COM2_CTS#	NA	NA
9	COM2_RI#	NA	NA

Table 4-21: RS-232 Serial Port Connector Pinouts (COM2)

4.3.7 RS-232 Serial Port Connector (COM3)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM3_DCD#	2	COM3_RXD
3	COM3_TXD	4	COM3_DTR#
5	GND	6	COM3_DSR#

7	COM3_RTS#	8	COM3_CTS#
9	COM3_RI#		

Table 4-22: RS-232 Serial Port Connector Pinouts (COM3)

4.3.8 RS-232 Serial Port Connector (COM4)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM4_DCD#	2	COM4_RXD
3	COM4_TXD	4	COM4_DTR#
5	GND	6	COM4_DSR#
7	COM4_RTS#	8	COM4_CTS#
9	COM4_RI#		

Table 4-23: RS-232 Serial Port Connector Pinouts (COM4)

4.3.9 RS-232 Serial Port Connector (COM5)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM5_DCD#	2	COM5_RXD
3	COM5_TXD	4	COM5_DTR#
5	GND	6	COM5_DSR#
7	COM5_RTS#	8	COM5_CTS#
9	COM5_RI#		

Table 4-24: RS-232 Serial Port Connector Pinouts (COM5)

4.3.10 RS-232 Serial Port Connector (COM6)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM6_DCD#	2	COM6_RXD
3	COM6_TXD	4	COM6_DTR#
5	GND	6	COM6_DSR#
7	COM6_RTS#	8	COM6_CTS#
9	COM6_RI#		

Table 4-25: RS-232 Serial Port Connector Pinouts (COM6)

4.3.11 RS-232 Serial Port Connector (COM7)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM7_DCD#	2	COM7_RXD
3	COM7_TXD	4	COM7_DTR#
5	GND	6	COM7_DSR#
7	COM7_RTS#	8	COM7_CTS#
9	COM7_RI#		

Table 4-26: RS-232 Serial Port Connector Pinouts (COM6)

4.3.12 RS-232 Serial Port Connector (COM8)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM8_DCD#	2	COM8_RXD
3	COM8_TXD	4	COM8_DTR#
5	GND	6	COM8_DSR#
7	COM8_RTS#	8	COM8_CTS#
9	COM8_RI#		

Table 4-27: RS-232 Serial Port Connector Pinouts (COM6)

4.3.13 RS-232 Serial Port Connector (COM9~16)

COM16	COM15	COM14	COM13	COM12	COM11	COM10	COM9
77	75	72	70	67	65	62	60
78	76	73	71	68	66	63	61
20	17	15	12	10	7	5	2
39	37	34	32	29	27	24	22
19	16	14	11	9	6	4	1
59	56	54	51	49	46	44	41
38	36	33	31	28	26	23	21
58	55	53	50	48	45	43	40
18	57	13	52	8	47	3	42

Table 4-28: RS-232 Serial Port Connector Pinouts (COM9~16)

4.3.14 USB 2.0 Connectors (USB56)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V5A_IO_USB45	2	-DATA6
3	+DATA6	4	GND
5	+V5A_IO_USB45	6	-DATA7
7	+DATA7	8	GND

Table 4-29: USB 3.0 Connectors Pinouts (USB56)

4.3.15 VGA Connector (VGA1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED_VGA	2	GREEN_VGA
3	BLUE_VGA	4	GND
5	NC	6	GND
7	GND	8	GND
9	+V5_VGA	10	DET#_VGA
11	NC	12	DDC_DATA_VGA
13	HSYNC_VGA	14	VSYNC_VGA
15	DDC_CLK_VGA		

Table 4-30: VGA Connector Pinouts (VGA1)

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL** or **F2** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes

Key	Function
-	Decrease the numeric value or make changes
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter 2.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

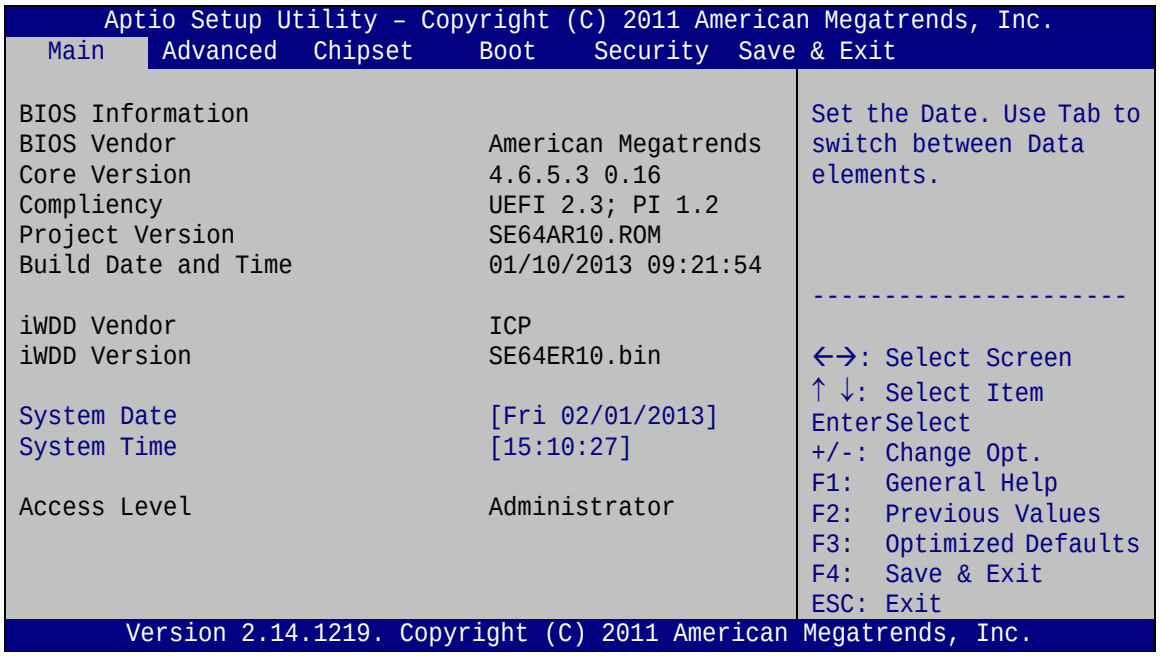
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.

- Save & Exit – Selects exit options and loads default settings.

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Compliency:** Current compliant version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

➔ iWDD Vendor

- The **iWDD Vendor** displays the installed iWDD vendor. The fields in **iWDD Vendor** cannot be changed.

➔ iWDD Version

- The **iWDD Version** displays the current iWDD version. The fields in **iWDD Version** cannot be changed.

The System Overview field also has two user configurable fields:

➔ System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ System Time [xx:xx:xx]

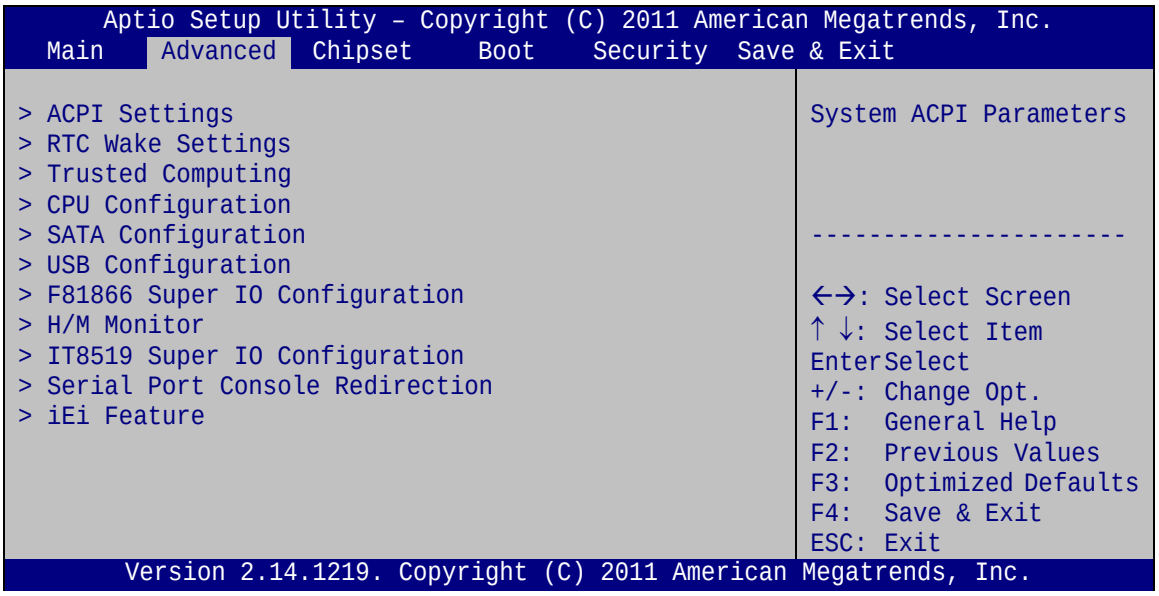
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

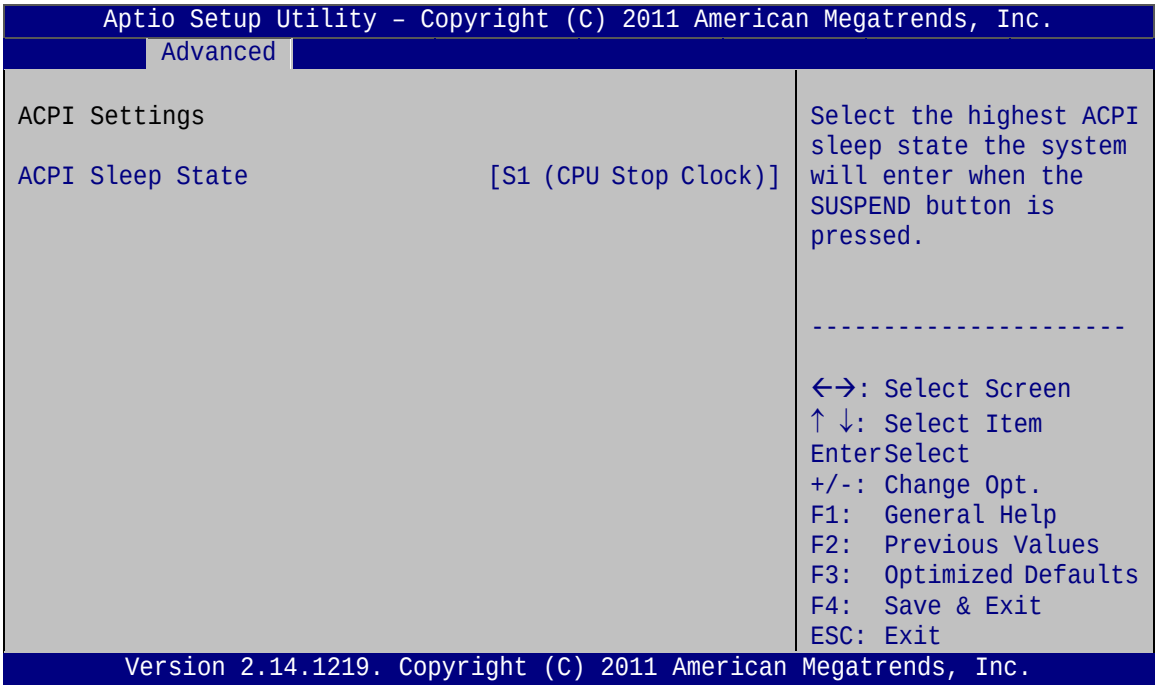
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS Menu 2: Advanced

5.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.



BIOS Menu 3: ACPI Configuration

➔ ACPI Sleep State [S1 (CPU Stop Clock)]

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (CPU Stop Clock)** **DEFAULT**	The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
➔ **S3 (Suspend to RAM)**	The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) configures RTC wake event.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
Wake system with Fixed Time      [Disabled]

                                 Enable or disable System
                                 wake on alarm event. When
                                 enabled, System will
                                 wake on the
                                 dat::hr::min::sec
                                 specified

                                 ----------------------

                                 ←→: Select Screen
                                 ↑ ↓: Select Item
                                 EnterSelect
                                 +/-: Change Opt.
                                 F1:  General Help
                                 F2:  Previous Values
                                 F3:  Optimized Defaults
                                 F4:  Save & Exit
                                 ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 4: RTC Wake Settings

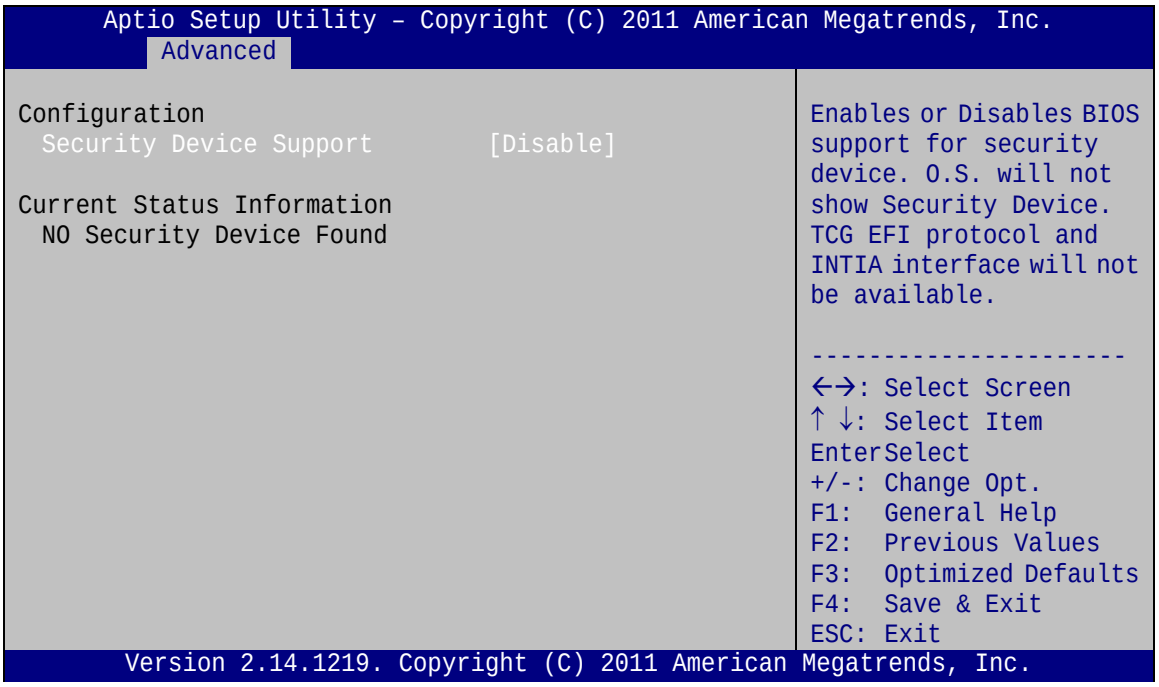
➔ Wake System with Fixed Time [Disabled]

Use the **Wake System with Fixed Time** option to specify the time the system should be roused from a suspended state.

➔ **Disabled**	**DEFAULT**	The real time clock (RTC) cannot generate a wake event
➔ **Enabled**		If selected, the following appears with values that can be selected: *Wake up every day *Wake up date *Wake up hour *Wake up minute *Wake up second After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 5**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 5: Trusted Computing

➔ Security Device Support [Disable]

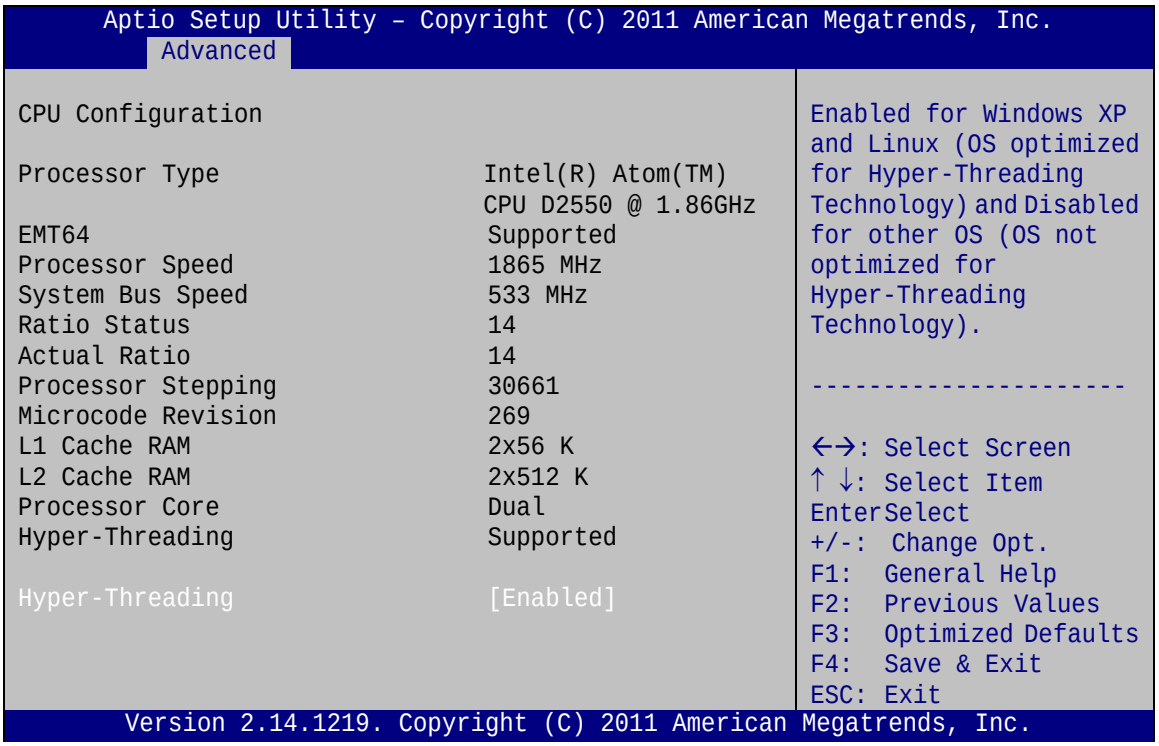
Use the **Security Device Support** option to configure support for the security device.

➔ **Disable** **DEFAULT** Security device support is disabled.

➔ **Enable** Security device support is enabled.

5.3.4 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to enter the **CPU Information** submenu or enable Intel Virtualization Technology.



BIOS Menu 6: CPU Configuration

The CPU Configuration menu (**BIOS Menu 6**) lists the following CPU details:

- **Processor Type**: Lists the brand name of the CPU being used.
- **EMT64**: Indicates if EMT64 is supported by the CPU.
- **Processor Speed**: Lists the CPU processing speed.
- **System Bus Speed**: Lists the system bus speed.
- **Ratio Status**: Lists the ratio status.
- **Actual Ratio**: Lists the ratio of the frequency to the clock speed.
- **Processor Stepping**: Lists the CPU ID.
- **Microcode Revision**: Lists the microcode revision.
- **L1 Cache RAM**: Lists the CPU L1 cache size.
- **L2 Cache RAM**: Lists the CPU L2 cache size.
- **Processor Core**: Lists the number of the processor core.
- **Hyper-Threading**: Indicates if Intel HT Technology is supported by the CPU.

➔ Hyper-Threading [Enabled]

Use the **Hyper-Threading** BIOS option to enable or disable the Intel Hyper-Threading Technology.

- ➔ **Disabled** Disables the Intel Hyper-Threading Technology.
- ➔ **Enabled** **DEFAULT** Enables the Intel Hyper-Threading Technology.

5.3.5 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) to change and/or set the configuration of the SATA devices installed in the system.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced

SATA Port0                      Not Present     Select a configuration
SATA Port1                      Not Present     for SATA Controller.

 Configure SATA as              [IDE]           ---------------------

                                                ←→: Select Screen
                                                ↑ ↓: Select Item
                                                EnterSelect
                                                F1   General Help
                                                F2   Previous Values
                                                F3    Optimized
                                                Defaults
                                                F4    Save
                                                ESC   Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 7: IDE Configuration

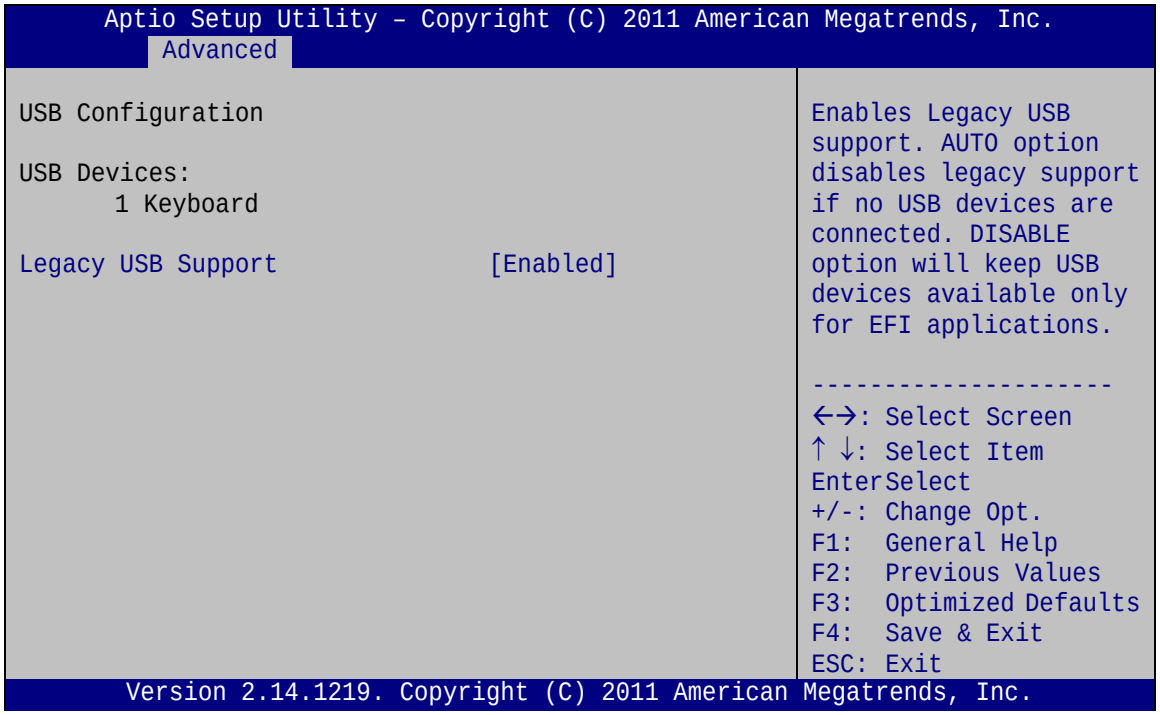
➔ Configure SATA as [IDE]

Use the **Configure SATA as** option to configure SATA devices as normal IDE or AHCI devices.

- ➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.
- ➔ **AHCI** Configures SATA devices as AHCI device.

5.3.6 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 8**) to read USB configuration information and configure the USB settings.



BIOS Menu 8: USB Configuration

➔ USB Devices

The **USB Devices** field lists the USB devices that are enabled on the system

➔ Legacy USB Support [Enabled]

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Enabled** **DEFAULT** Legacy USB support enabled

➔	**Disabled**	Legacy USB support disabled
➔	**Auto**	Legacy USB support disabled if no USB devices are connected

5.3.7 F81866 Super IO Configuration

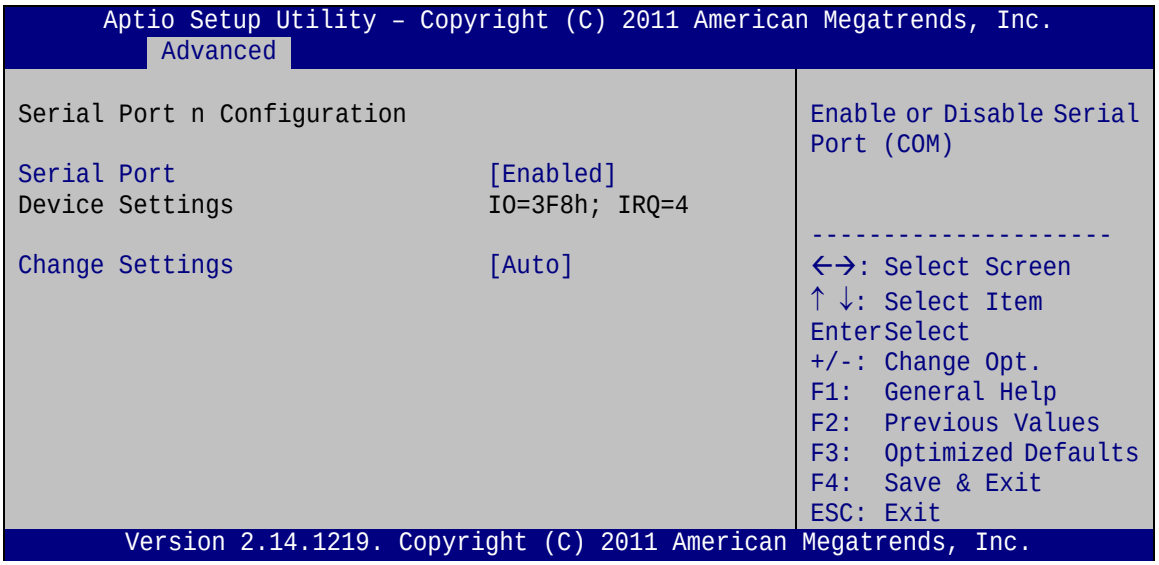
Use the **F81866 Super IO Configuration** menu (**BIOS Menu 9**) to set or change the configurations for the serial ports.

```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
          Advanced
 F81866 Super IO Configuration                  | Set Parameters of Serial
                                                | Port 1 (COMA)
 F81866 Super IO Chip            F81866         |
                                                |
 > Serial Port 1 Configuration                  | ---------------------
 > Serial Port 2 Configuration                  | ←→: Select Screen
 > Serial Port 3 Configuration                  | ↑ ↓: Select Item
 > Serial Port 4 Configuration                  | EnterSelect
 > Serial Port 5 Configuration                  | +/-: Change Opt.
 > Serial Port 6 Configuration                  | F1:  General Help
                                                | F2:  Previous Values
                                                | F3:  Optimized Defaults
                                                | F4:  Save & Exit
                                                | ESC: Exit
      Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 9: F81866 Super IO Configuration

5.3.7.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 10**) to configure the serial port n.



BIOS Menu 10: Serial Port n Configuration Menu

5.3.7.1.1 Serial Port 1 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔	**Disabled**		Disable the serial port
➔	**Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔	**Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔	**IO=3F8h; IRQ=4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

- ➔ **IO=3F8h; IRQ=3, 4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2F8h; IRQ=3, 4** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4

➔ Device Mode [RS232]

Use the **Device Mode** option to select the serial port mode.

- ➔ **RS232** **DEFAULT** — Enables serial port RS-232 support.
- ➔ **RS422** — Enables serial port RS-422 support.
- ➔ **RS485** — Enables serial port RS-485 support.

5.3.7.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** — Disable the serial port
- ➔ **Enabled** **DEFAULT** — Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2F8h; IRQ=3** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
- ➔ **IO=3F8h; IRQ=3, 4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4

- **IO=2F8h; IRQ=3, 4** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4

➔ Device Mode [RS232]

Use the **Device Mode** option to select the serial port mode.

- **RS232** **DEFAULT** — Enables serial port RS-232 support.
- **RS422** — Enables serial port RS-422 support.
- **RS485** — Enables serial port RS-485 support.

5.3.7.1.3 Serial Port 3 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled** — Disable the serial port
- **Enabled** **DEFAULT** — Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- **IO=3E8h; IRQ=10** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
- **IO=3E8h; IRQ=10, 11** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- **IO=2E8h; IRQ=10, 11** — Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11

5.3.7.1.4 Serial Port 4 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2E8h; IRQ=10**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
➔ **IO=2E8h; IRQ=10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11

5.3.7.1.5 Serial Port 5 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=280h; IRQ=10**		Serial Port I/O port address is 280h and the interrupt address is IRQ10
➔ **IO=280h; IRQ=10, 11**		Serial Port I/O port address is 280h and the interrupt address is IRQ10, 11
➔ **IO=288h; IRQ=10, 11**		Serial Port I/O port address is 288h and the interrupt address is IRQ10, 11

5.3.7.1.6 Serial Port 6 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2D8h; IRQ=10**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10
➔ **IO=2C0h; IRQ=10, 11**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
➔ **IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
➔ **IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11

➔ **IO=2D8h; IRQ=10, 11** Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

➔ **IO=2E0h; IRQ=10, 11** Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

5.3.8 H/W Monitor

The **H/W Monitor** menu (**BIOS Menu 11**) shows the operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
PC Health Status                                Enable or Disable Smart
                                                Fan
CPU Temperature                 :+44 C
System Temperature              :+35 C
                                                ----------------------
                                                ←→: Select Screen
                                                ↑ ↓: Select Item
                                                EnterSelect
                                                +/-: Change Opt.
                                                F1:  General Help
                                                F2:  Previous Values
                                                F3:   Optimized
                                                Defaults
                                                F4:   Save & Exit
                                                ESC:  Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 11: Hardware Health Configuration

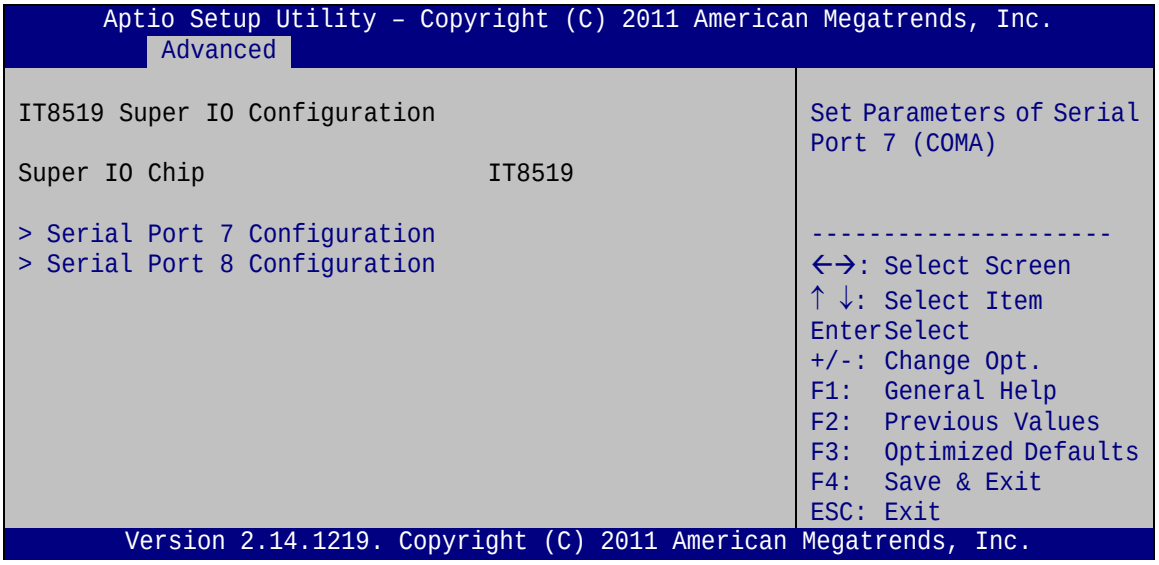
➔ PC Health Status

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature

5.3.9 IT8519 Super IO Configuration

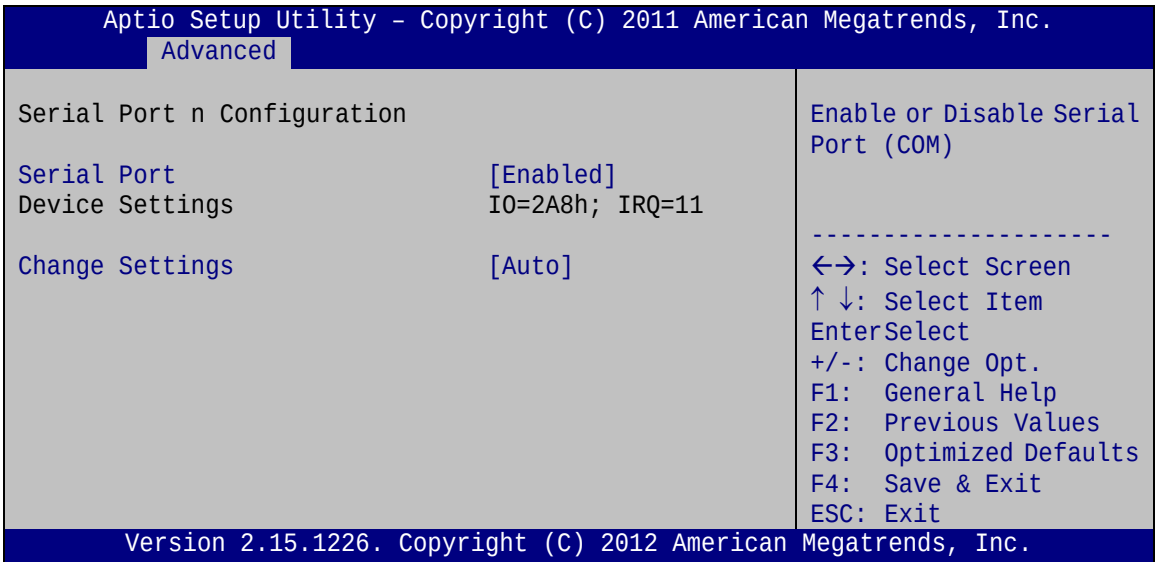
Use the **IT8519 Super IO Configuration** menu (**BIOS Menu 12**) to set or change the configurations for the serial ports.



BIOS Menu 12: Secondary Super IO Configuration

5.3.9.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 13**) to configure the serial port n.



BIOS Menu 13: Serial Port n Configuration Menu

5.3.9.1.1 Serial Port 7 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2A8h; IRQ=11**		Serial Port I/O port address is 2A8h and the interrupt address is IRQ11
➔ **IO=2A8h; IRQ=10, 11**		Serial Port I/O port address is 2A8h and the interrupt address is IRQ10, 11
➔ **IO=2B8h; IRQ=10, 11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

5.3.9.1.2 Serial Port 8 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

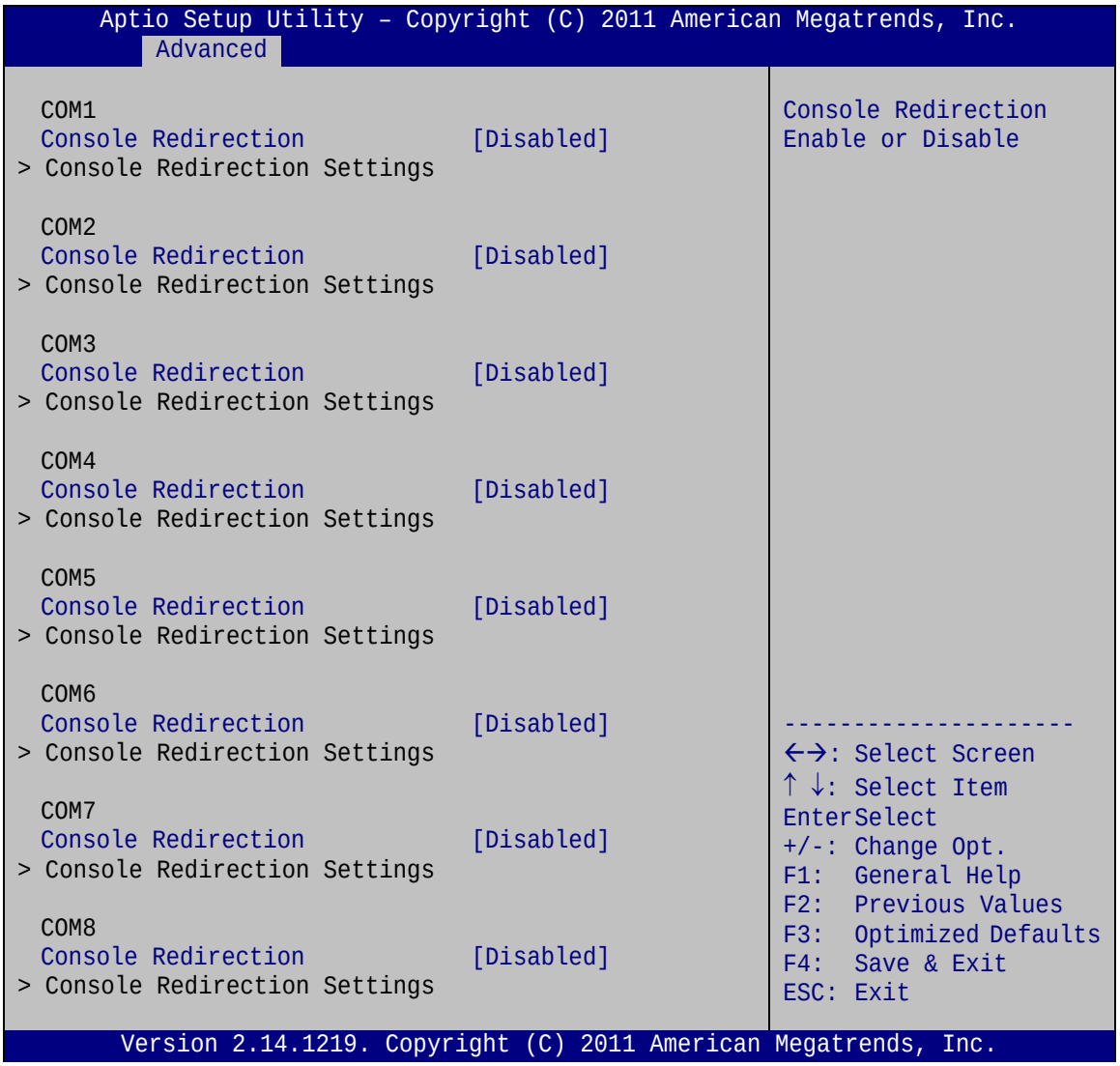
➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2B8h; IRQ=11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ11
➔ **IO=2A8h; IRQ=10, 11**		Serial Port I/O port address is 2A8h and the interrupt address is IRQ10, 11
➔ **IO=2B8h; IRQ=10, 11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

5.3.10 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 14**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 14: Serial Port Console Redirection

➔ Console Redirection [Disabled]

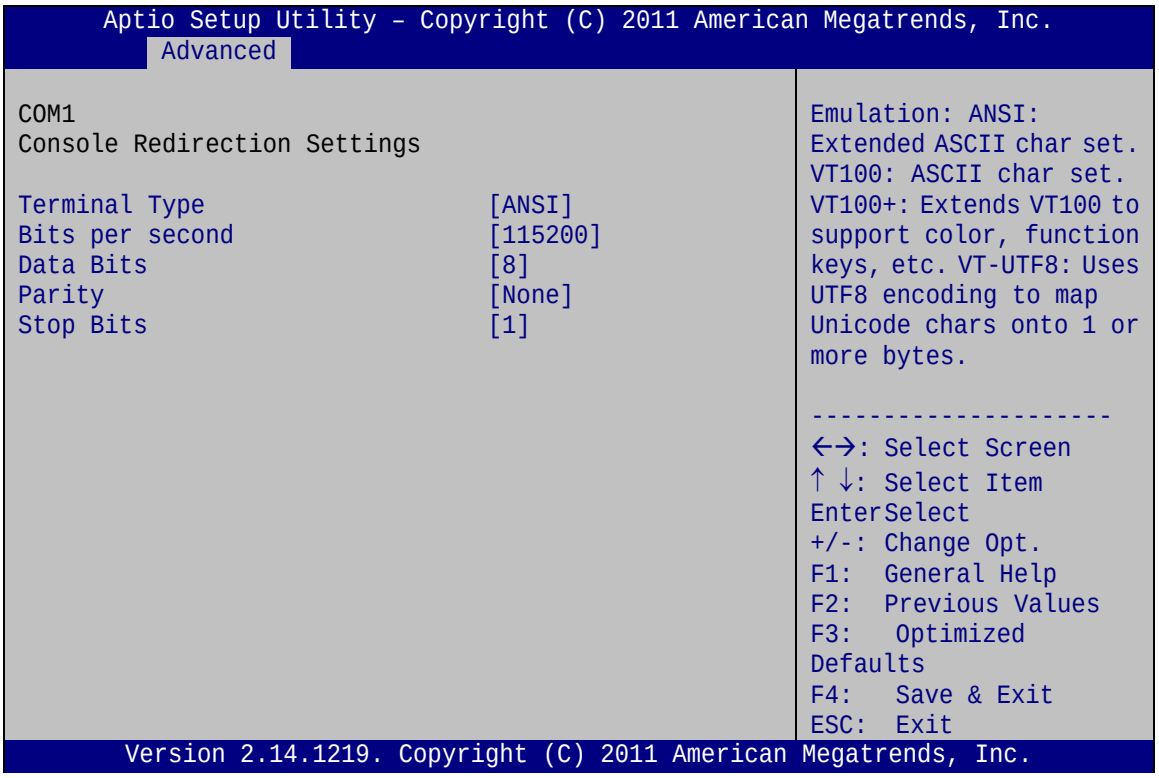
Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled** **DEFAULT** Disabled the console redirection function

➔ **Enabled** Enabled the console redirection function

5.3.10.1 Console Redirection Settings

The **Console Redirection Settings** menu (**BIOS Menu 15**) allows the console redirection options to be configured. The option is active when Console Redirection option is enabled.



BIOS Menu 15: Console Redirection Settings

➔ Terminal Type [ANSI]

Use the **Terminal Type** option to specify the remote terminal type..

➔	**VT100**		The target terminal type is VT100
➔	**VT100+**		The target terminal type is VT100+
➔	**VT-UTF8**		The target terminal type is VT-UTF8
➔	**ANSI**	**DEFAULT**	The target terminal type is ANSI

➔ Bits per second [115200]

Use the **Bits per second** option to specify the transmission speed of the serial port.

➔	**9600**	The transmission speed is 9600
➔	**19200**	The transmission speed is 19200
➔	**38400**	The transmission speed is 38400

- **57600** The transmission speed is 57600
- **115200** **DEFAULT** The transmission speed is 115200

➔ Data Bits [8]

Use the **Data Bits** option to specify the number of data bits.

- **7** Sets the data bits at 7.
- **8** **DEFAULT** Sets the data bits at 8.

➔ Parity [None]

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- **None** **DEFAULT** No parity bit is sent with the data bits.
- **Even** The parity bit is 0 if the number of ones in the data bits is even.
- **Odd** The parity bit is 0 if the number of ones in the data bits is odd.
- **Mark** The parity bit is always 1. This option does not provide error detection.
- **Space** The parity bit is always 0. This option does not provide error detection.

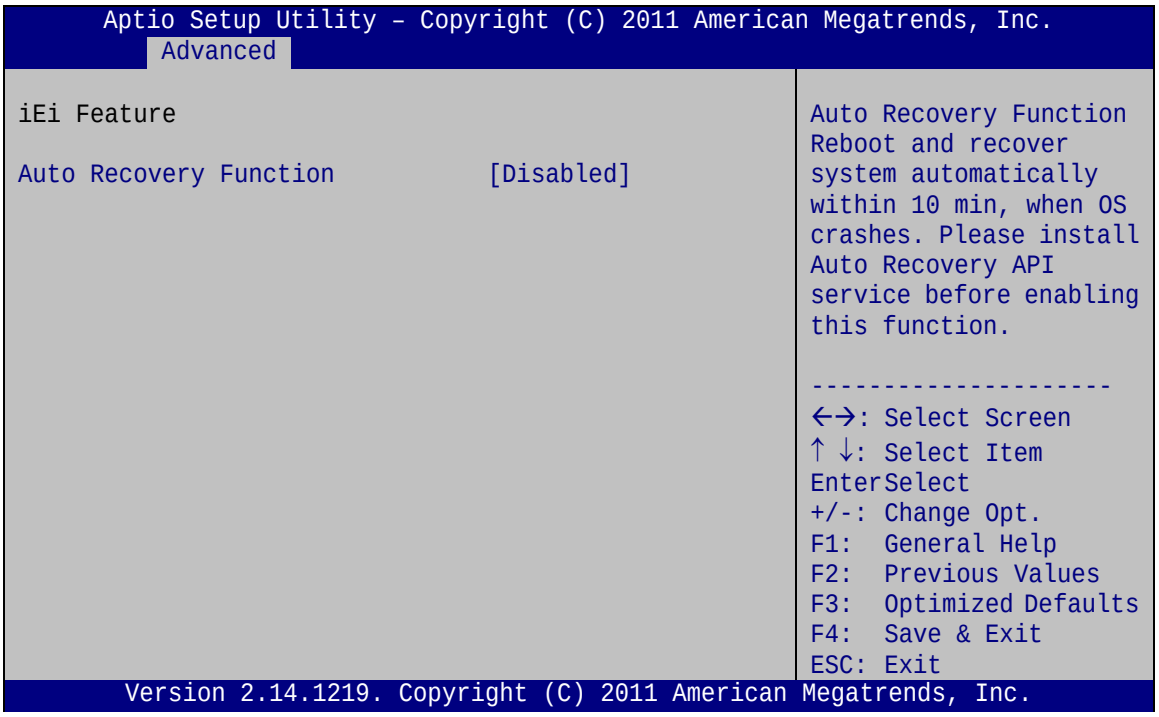
➔ Stop Bits [1]

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- **1** **DEFAULT** Sets the number of stop bits at 1.
- **2** Sets the number of stop bits at 2.

5.3.11 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 16**) to configure the iEi features.



BIOS Menu 16: iEi Feature

➔ Auto Recovery Function [Disabled]

Use **Auto Recovery Function** option to enable or disable the auto recovery function.

➔ **Disabled** **DEFAULT** Disabled the auto recovery function

➔ **Enabled** Enabled the auto recovery function

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 17**) to access the Host Bridge and South Bridge configuration menus.

WARNING!

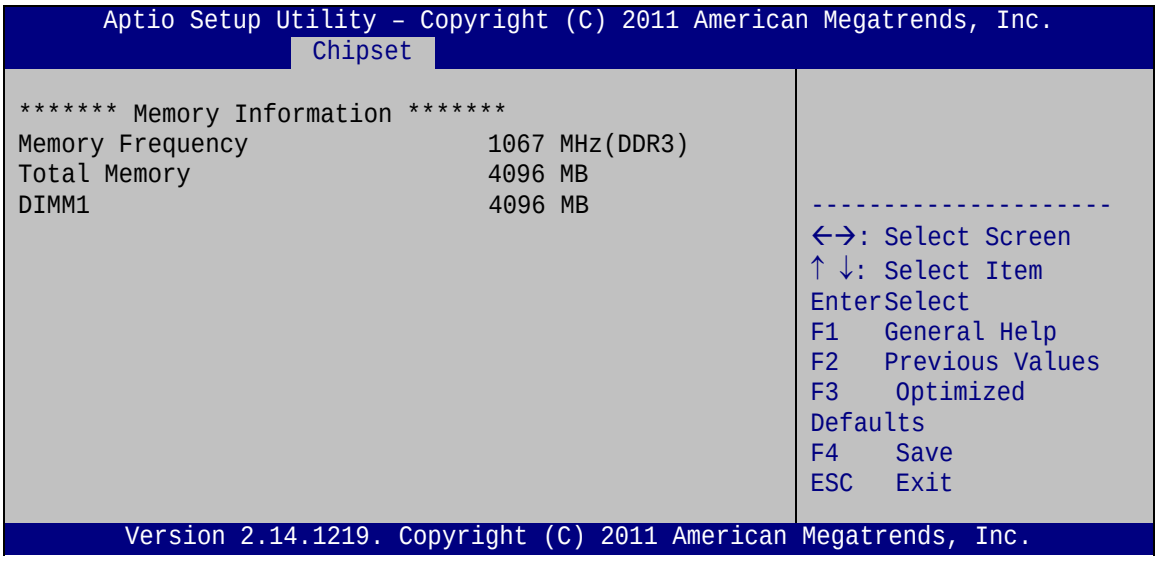
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
  Main    Advanced  Chipset    Boot    Security  Save & Exit

> Host Bridge                                   Host Bridge Parameters
> South Bridge


                                                ---------------------
                                                ←→: Select Screen
                                                ↑ ↓: Select Item
                                                EnterSelect
                                                +/-: Change Opt.
                                                F1:  General Help
                                                F2:  Previous Values
                                                F3:  Optimized Defaults
                                                F4:  Save & Exit
                                                ESC: Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 17: Chipset

5.4.1 Host Bridge Configuration

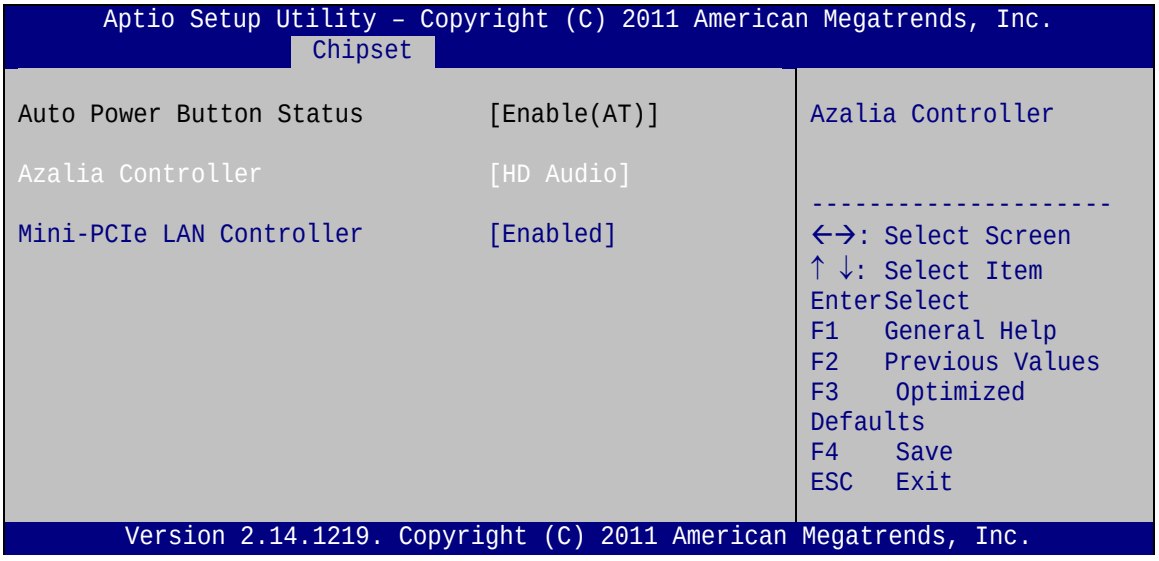
Use the **Host Bridge** menu (**BIOS Menu 18**) to view the memory information.



BIOS Menu 18: Host Bridge

5.4.2 South Bridge Configuration

Use the **South Bridge** menu (**BIOS Menu 19**) to configure the south bridge chipset.



BIOS Menu 19:South Bridge

➔ Azalia Controller [Enabled]

Use the **Azalia Controller** option to enable or disable the High Definition Audio controller.

➔ **Disabled**		The onboard High Definition Audio controller is disabled
➔ **HD Audio**	**DEFAULT**	The onboard High Definition Audio controller automatically detected and enabled

➔ Mini-PCIe LAN Controller [Enabled]

Use the **Mini-PCIe LAN Controller** option to enable or disable the mini PCIe LAN controller.

➔ **Disabled**		Disables the mini PCIe LAN controller
➔ **Enabled**	**DEFAULT**	Enables the mini PCIe LAN controller

5.5 Boot

Use the **Boot** menu (**BIOS Menu 20**) to configure system boot options.

```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
  Main    Advanced   Chipset    Boot    Security   Save & Exit

Boot Configuration                          Select the keyboard
Bootup NumLock State          [On]          NumLock state
Quiet Boot                    [Enabled]
Launch PXE OpROM              [Disabled]
Option ROM Messages           [Force BIOS]  ---------------------
UEFI Boot                     [Disabled]    ←→: Select Screen
                                            ↑ ↓: Select Item
Boot Option Priorities                      EnterSelect
                                            +/-: Change Opt.
                                            F1:  General Help
                                            F2:  Previous Values
                                            F3:  Optimized Defaults
                                            F4:  Save & Exit
                                            ESC: Exit
      Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 20: Boot

➔ Bootup NumLock State [On]

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.
➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**		Normal POST messages displayed
➔ **Enabled**	**DEFAULT**	OEM Logo displayed instead of POST messages

➔ Launch PXE OpROM [Disabled]

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

➔ **Disabled**	**DEFAULT**	Disables boot from legacy network devices
➔ **Enabled**		Enables boot from legacy network devices

➔ Option ROM Messages [Force BIOS]

Use the **Option ROM Messages** option to set the Option ROM display mode.

➔ **Force BIOS** **DEFAULT** Sets display mode to force BIOS.

➔ **Keep Current** Sets display mode to current.

➔ UEFI Boot [Disabled]

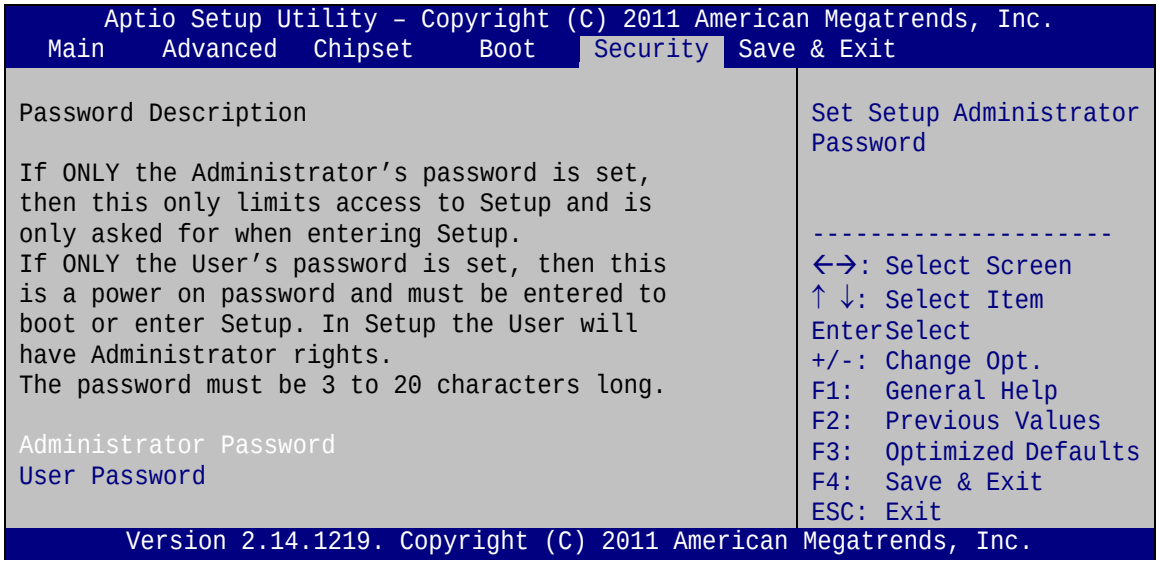
Use the **UEFI Boot** option to enable or disable to boot from the UEFI devices.

➔ **Enabled** Boot from UEFI devices is enabled.

➔ **Disabled** **DEFAULT** Boot from UEFI devices is disabled.

5.6 Security

Use the **Security** menu (**BIOS Menu 21**) to set system and user passwords.



BIOS Menu 21: Security

➔ Administrator Password

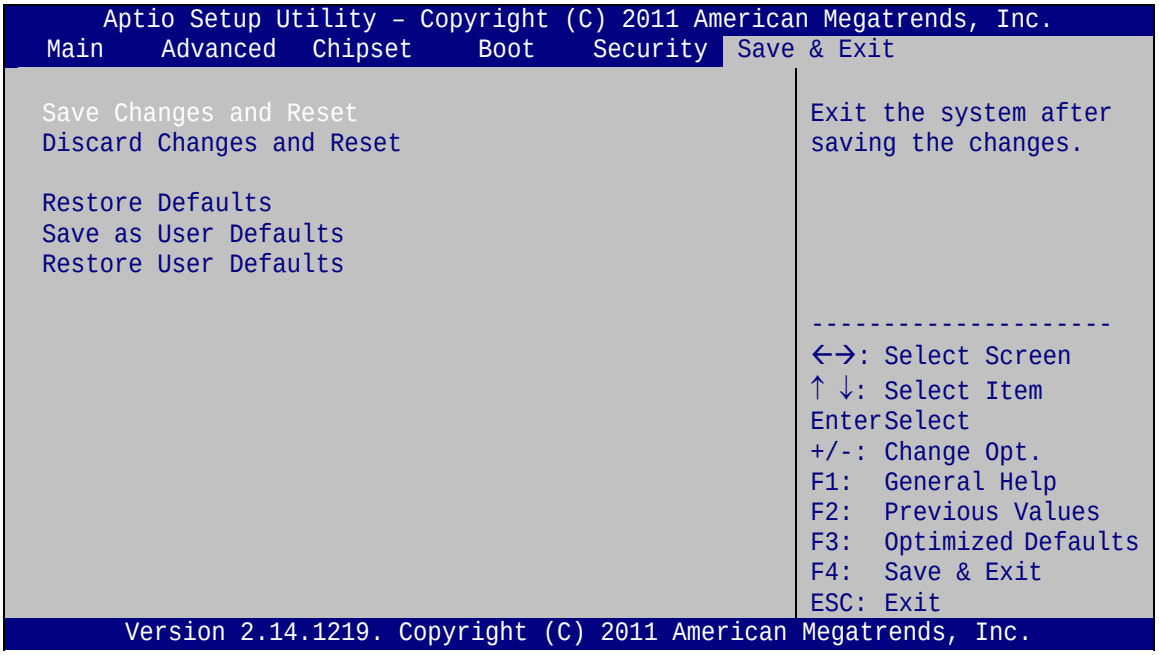
Use the **Administrator Password** to set or change an administrator password.

➔ User Password

Use the **User Password** to set or change a user password.

5.7 Exit

Use the **Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 22:Exit

➔ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ Save as User Defaults

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ Restore User Defaults

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

CE

This equipment is in conformity with the following EU directives:

- EMC Directive (2004/108/EC, 2014/30/EU)
- Low-Voltage Directive (2006/95/EC, 2014/35/EU)
- RoHS II Directive (2011/65/EU, 2015/863/EU)

If the user modifies and/or install other devices in the equipment, the CE conformity declaration may no longer apply.

If this equipment has telecommunications functionality, it also complies with the requirements of the Radio Equipment Directive 2014/53/EU.

	English IEI Integration Corp declares that this equipment is in compliance wi the essential requirements and other relevant provisions of Directive 2014/53/EU.
	Български [Bulgarian] IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложим правила на Директива 2014/53/EU.
	Česky [Czech] IEI Integration Corp tímto prohlašuje, že tento zařízení je ve shodě s základními požadavky a dalšími příslušnými ustanoveními směrnice 2014/53/EU.
	Dansk [Danish] IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 2014/53/EU.

	Deutsch [German] IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 2014/53/EU.
	Eesti [Estonian] IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 2014/53/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
	Español [Spanish] IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 2014/53/EU.
	Ελληνική [Greek] IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 2014/53/EU.
	Français [French] IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53/EU.
	Italiano [Italian] IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53/EU.
	Latviski [Latvian] IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 2014/53/EU.

	Lietuvių [Lithuanian] IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 2014/53/EU Direktyvos nuostatas.
	Nederlands [Dutch] IEI Integration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 2014/53/EU.
	Malti [Maltese] IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 2014/53/EU.
	Magyar [Hungarian] IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvetõ követelményeknek és az 2014/53/EU irányelv egyéb elõírásainak.
	Polski [Polish] IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 2014/53/EU.
	Português [Portuguese] IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 2014/53/EU.
	Româna [Romanian] IEI Integration Corp declară că acest echipament este in conformitate cu cerințele esențiale şi cu celelalte prevederi relevante ale Directivei 2014/53/EU.

	Slovensko [Slovenian] IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 2014/53/EU.
	Slovensky [Slovak] IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 2014/53/EU.
	Suomi [Finnish] IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 2014/53/EU oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
	Svenska [Swedish] IEI Integration Corp förklarar att denna utrustningstyp står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/EU.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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 the user will be required to correct the interference at his own expense.

Federal Communication Commission Interference Statement

This equipment has been assembled with components that comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Appendix

B

Safety Precautions

B.1 Safety Precautions

WARNING:

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the TANK-600.

Please follow the safety precautions outlined in the sections that follow:

B.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Make sure the power is turned off and the power cord is disconnected*** when moving, installing or modifying the system.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if opened while still powered on.
- ***Do not drop or insert any objects*** into the ventilation openings.
- ***If considerable amounts of dust, water, or fluids enter the system***, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- **DO NOT**:
  - Drop the system against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

B.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the TANK-600 may result in permanent damage to the TANK-600 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-600. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-600 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

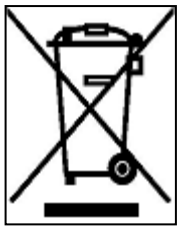
B.1.3 Product Disposal

CAUTION:

Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union – The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the TANK-600, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the TANK-600, please read the details below.

- The interior of the TANK-600 does not require cleaning. Keep fluids away from the TANK-600 interior.
- Be cautious of all small removable components when vacuuming the TANK-600.
- Turn the TANK-600 off before cleaning the TANK-600.
- Never drop any objects or liquids through the openings of the TANK-600.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the TANK-600.
- Avoid eating, drinking and smoking within vicinity of the TANK-600.

B.2.2 Cleaning Tools

Some components in the TANK-600 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the TANK-600.

- . ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the TANK-600.

- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the TANK-600.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the TANK-600 as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the TANK-600. Dust and dirt can restrict the airflow in the TANK-600 and cause its circuitry to corrode.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H

;
; EXIT ;
```

Appendix

D

Hazardous Materials Disclosure

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated "Environmentally Friendly Use Period" (EFUP). This is an estimate of the number of years that these substances would "not leak out or undergo abrupt change." This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。