USER MANUAL

AMOS-3002

Compact Fanless Embedded System

1.01-07022012-145400

Copyright

Copyright © 2012 VIA Technologies Incorporated. All rights reserved.

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise without the prior written permission of VIA Technologies, Incorporated.

Trademarks

All trademarks are the property of their respective holders.

PS/2 is a registered trademark of IBM Corporation.

Disclaimer

No license is granted, implied or otherwise, under any patent or patent rights of VIA Technologies. VIA Technologies makes no warranties, implied or otherwise, in regard to this document and to the products described in this document. The information provided in this document is believed to be accurate and reliable as of the publication date of this document. However, VIA Technologies assumes no responsibility for the use or misuse of the information in this document and for any patent infringements that may arise from the use of this document. The information and product specifications within this document are subject to change at any time, without notice and without obligation to notify any person of such change.

VIA Technologies, Inc. reserves the right the make changes to the products described in this manual at any time without prior notice.

Regulatory Compliance

FCC-A Radio Frequency Interference Statement

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 personal expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Battery Recycling and Disposal

- ☐ Only use the appropriate battery specified for this product.
- ☐ Do not re-use, recharge, or reheat an old battery.
- ☐ Do not attempt to force open the battery.
- ☐ Do not discard used batteries with regular trash.
- ☐ Discard used batteries according to local regulations.

Safety Precautions

- ☐ Always read the safety instructions carefully.
- ☐ Keep this User's Manual for future reference.
- ☐ All cautions and warnings on the equipment should be noted.
- ☐ Keep this equipment away from humidity.
- ☐ Lay this equipment on a reliable flat surface before setting it up.
- ☐ Make sure the voltage of the power source and adjust properly
- ☐ 110/220V before connecting the equipment to the power inlet.
- ☐ Place the power cord in such a way that people cannot step on it.
- ☐ Always unplug the power cord before inserting any add-on card or module.
- ☐ If any of the following situations arises, get the equipment checked by authorized service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment has not worked well or you cannot get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - The equipment has obvious sign of breakage.
- ☐ Do not leave this equipment in an environment unconditioned or in a storage temperature above 70°C (158°F). The equipment may be damaged.
- ☐ Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- ☐ Do not place anything over the power cord.
- ☐ Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating.

Packing Lists

- ☐ 1 x AMOS-3002 unit
- ☐ 1 x VESA Mount bracket
- ☐ 2 x Wall Mount bracket
- ☐ 1 x Power Cable, 2-Pole Phoenix Plug to DC-Jack
- ☐ 1 x Thermal pad for memory
- ☐ 1 x Thermal pad for CFast
- ☐ 4 x Bottom Washer Rubber
- ☐ 1 x HDMI® to DVI-D adapter Cable

Ordering Information

AMOS-3002-1D10A1

1.0GHz Eden™ X2 CPU based Fanless Embedded system, with VGA, HDMI®, 6xUSB 2.0 (2 x lockable), 2xCOM, 2xGbE, 1xSpeaker, MIC-in, 1xGPIO, DC-in 12V

Optional Accessories

External AC-to-DC Adapter and Power Cable

Model Number	Description
99G63-020216	Power adapter input 100V-240V; output 12V, 60W, with 2-pin phoenix connector, pitch=3.81mm
99G63-020316	Power adapter input 100V-240V; output 12V, 60W, with 2-pin phoenix connector, pitch=3.81mm
99G33-02032C	Power Cord, 180 cm, USA type
99G33-02033C	Power Cord, 180 cm, Europe type
99G33-02031C	Power Cord, 180 cm, UK type

Table of Contents

1. Product Overview 1
1.1. Key Features 1
1.2. Product Specifications 3
1.2.1. Computing System 3
1.2.2. Memory 3
1.2.3. Graphics 4
1.2.4. Gigabit Ethernet 4
1.2.5. HD Audio 4
1.2.6. Serial 5
1.2.7. GPIO 5
1.2.8. Storage 5
1.2.9. System Indicator 5
1.2.10. Watch Dog Timer 6
1.2.11. Expansion 6
1.2.12. Front Panel External I/O connectors 6
1.2.13. Rear Panel External I/O connectors 7
1.2.14. Power Supply 7
1.2.15. Mechanical 8
1.2.16. Environmental Specification 8
1.2.17. Software Compatibility 9
1.3. Product Dimensions 10

2. I/O Interface 11
2.1. External I/O Ports 11
2.1.1. Power Button 13
2.1.2. DC-In Power Input Connector 13
2.1.3. LED Indicators 14
2.1.4. Audio Jacks 15
2.1.5. COM Connector 16
2.1.6. USB 2.0 Ports 17
2.1.7. Lockable USB 2.0 Ports 18

2.1.8. SIM socket 19
2.1.9. CFast Socket 19
2.1.10. DIO 20
2.1.11. VGA Connector 21
2.1.12. Gigabit Ethernet Port 22
2.1.13. HDMI® Port 23

3. Hardware Installation 25
3.1. How to install SODIMM memory module 25
3.2. How to remove the cover 28
3.3. How to install 3G and GPS kit 30
3.4. How to install WLAN kit 33
3.5. How to install CFast Card 36
3.6. How to install CFast thermal pad 37
3.7. How to install SIM Card 39
3.8. How to install the Mounting Brackets 40
3.9. How to install the VESA plate 42

4. BIOS Setup 45
4.1. Entering the BIOS Setup Menu 45
4.2. Control Keys 45
4.3. Getting Help 46
4.4. System Overview 46
4.4.1. AMIBIOS 46
4.4.2. Processor 46
4.4.3. System Memory 47
4.4.4. System Time 47
4.4.5. System Date 47
4.5. Advanced Settings 48
4.5.1. CPU Configuration 49
4.5.2. IDE Configuration 50
4.5.3. SuperIO Configuration 51
4.5.4. ACPI Configuration 52

4.5.5. APM Configuration 54
4.5.6. Spread Spectrum Configuration 57
4.5.7. USB Configuration 58
4.5.8. CRB Configuration 59
4.6. Boot Settings 61
4.6.1. Boot Settings Configuration 62
4.6.2. Boot Device Priority 64
4.7. Security Settings 65
4.7.1. Change Supervisor Password 65
4.7.2. User Access Level 65
4.7.3. Change User Password 66
4.7.4. Clear User Password 66
4.7.5. Password Check 67
4.8. Exit Options 68
4.8.1. Save Changes and Exit 68
4.8.2. Discard Changes and Exit 68
4.8.3. Discard Changes 68
4.8.4. Load Optimal Defaults 69

5. Driver Installation 71
5.1. Microsoft Driver Support 71
5.2. Linux Driver Support 71

6. Troubleshooting 73

Lists of Figures

Figure 1: AMOS-3002 Dimensions - Front view 10
Figure 2: AMOS-3002 Dimensions - Side view 10
Figure 3: Front I/O panel 11
Figure 4: Rear I/O panel 12
Figure 5: Power button diagram 13
Figure 6: Power input connector pinout diagram 13
Figure 7: System LED indicators 14
Figure 8: Audio jack receptacle stack 15
Figure 9: COM connector pinout diagram 16
Figure 10: USB 2.0 port pinout diagram 17
Figure 11: Lockable USB port pinout diagram 18
Figure 12: CFast socket diagram 19
Figure 13: CFast socket diagram 19
Figure 14: DIO port pinout diagram 20
Figure 15: VGA connector pinout diagram 21
Figure 16: Gigabit Ethernet port pinout diagram 22
Figure 17: HDMI port pinout diagram 23
Figure 18: Illustration of the Main menu screen 46
Figure 19: Illustration of the Advanced Settings screen 48
Figure 20: Illustration of the CPU Configuration screen 49
Figure 21: Illustration of IDE Configuration screen 50
Figure 22: Illustration of SuperIO Configuration screen 51
Figure 23: Illustration of ACPI Configuration screen 52
Figure 24: Illustration of APM Configuration screen 54
Figure 25: Illustration of CPU Spread Spectrum Configuration screen 57
Figure 26: Illustration of USB Configuration screen 58
Figure 27: Illustration of CRB Configuration screen 59
Figure 28: Illustration of Boot Settings screen 61
Figure 29: Illustration of Boot Settings Configuration screen 62
Figure 30: Illustration of the Boot Device Priority screen 64
Figure 31: Illustration of Security Settings screen 65

Figure 32: Illustration of Exit Options screen 68

Lists of Tables

Table 1: Power input connector pinout 13
Table 2: Audio jack receptacle pinout 15
Table 3: COM connector pinout 16
Table 4: USB 2.0 port pinout 17
Table 5: Lockable USB port pinout 18
Table 6: DIO port pinout 20
Table 7: VGA connector pinout 21
Table 8: Gigabit Ethernet port pinout 22
Table 9: HDMI port pinout 23

1. Product Overview

The AMOS-3002 is a fanless and ultra compact embedded system, which supports intensive I/O functions for diversified embedded applications. Based on the VIA Pico-ITX form factor, its innovative design helps to simplify the efforts of embedded system integration. The AMOS-3002 carries a qualified thermal performance design that allows a wide range of operating temperatures — making it suitable for various industrial or embedded applications.

The AMOS-3002 is composed of a few main mechanical parts such as top cover, bottom plate, and front and rear I/O access plates, which brings optimization to the system integration. AMOS-3002 offers one SKU: AMOS-3002-1D10A1. AMOS-3002-1D10A1 supports CFast socket for CFast flash disk storage. The AMOS-3002-1D10A1 comes with support for wireless communication modules including GPS, 3G and WLAN.

1.1. Key Features

- ☐ **A fanless, ultra compact chassis**
  The AMOS-3002 houses the EPIA-P900 Pico-ITX form factor embedded board. With a maximum mounting height of only 49 mm, the AMOS-3002 can be used in space critical installation environments.

- ☐ **Stylish, fully sealed metal alloy design**
  The chassis of the AMOS-3002 is composed of four main parts. The stylishly ridged aluminum top cover does double duty and acts as the heatsink of the AMOS-3002.

- ☐ **Optimized integration with front and rear I/O access**
  Front and rear I/O access enables the AMOS-3002 to easily support various applications.

☐ **Wide Range of Operating Temperatures**

The AMOS-3002 carries a qualified thermal performance design which allows a wide range of operating temperatures from -20°C up to 60°C, suitable for space and environment critical applications.

☐ **Shock Resistant**

The AMOS-3002 is shock resistant to 50G (with CFast Flash disk) for maximum reliability.

☐ **Display Acceleration**

The AMOS-3002 supports hardware acceleration of MPEG-2, WMV9/VC1 and H.264 for full HD 1080P display.

☐ **Storage expansion kit**

The storage sub-system expansion chassis kit enables the AMOS-3002 to have built-in storage of CFast Flash Disk.

☐ **Networking options**

The AMOS-3002 provides Gigabit Ethernet support for high speed data transmission. The optional wireless networking module can provide the AMOS-3002-1D10A1 with the freedom of GPS, 3G and WiFi access.

☐ **Multiple mounting solutions**

The AMOS-3002 supports multiple methods for mounting the chassis securely. The rugged industrial PC can be mounted to a table, wall, or even to VESA mountable surfaces with the VESA mounting kit. Moreover, AMOS can be mounted to table or wall using the mounting brackets

☐ **Embedded OS ready**

The AMOS-3002 is 100% compatible with several operating systems including Microsoft Widows XP, Windows 7, Windows Embedded Standard, Windows Embedded Standard 7 and Linux.

1.2. Product Specifications

1.2.1. Computing System

- **Processor**
  - 1.0 GHz VIA Eden X2
    - 800 MHz Front Side Bus
    - 2 MB L2 Cache

- **Chipset**
  - VIA VX900H advanced all-in-one system processor

- **BIOS**
  - AMI 8MBit SPI Flash BIOS

- **System Power Management**
  - Wake-on LAN, Keyboard Power-on, Timer Power-on, System power management, AC power failure recovery, Watch Dog Timer control

1.2.2. Memory

- **Technology**
  - 1 x DDR3 800/1066 204-pin SODIMM socket

- **Maximum Capacity**
  - Up to 4GB memory size

1.2.3. Graphics

- **Controller**
  - Integrated VIA Chrome 9™ HD DX9 3D/2D video processor with MPEG-2, WMV9/VC1, H.264 video decoding acceleration

- **Display Memory**
  - Optimized Unified Memory Architecture (UMA) Supports up to 512 MB frame buffer using system memory

- **CRT Interface**
  - Support 1 x External VGA port by a DB-9 connector Pixel Resolution support up to 2560 x 1600

- **HDMI® Interface**
  - Onboard 1 of HDMI® port connector

- **Dual View**
  - Support dual independent views

1.2.4. Gigabit Ethernet

- **Controller**
  - AMOS-3002-1D10A1
    Built-in two VIA VT6130 Gigabit Ethernet controllers

- **Interface**
  - AMOS-3002-1D10A1
    Support two RJ45 connectors

1.2.5. HD Audio

- **Controller**
  - AMOS-3002-1D10A1
    VIA VT2021 High Definition Audio Codec

- **Interface**
  - Support 2 x 3.5Φ Audio Jack as Line-out and Mic-in

1.2.6. Serial

- **USB**
  - Support 6 x USB ports, USB 2.0 compliant In the 6 USB ports, of which the two used Lockable USB interface connector for secure connection

- **Serial Ports**
  - 2 x COM ports of 1 x RS-232 and 1x RS-232/422/485 (Jumper selectable)

1.2.7. GPIO

- **General Purpose I/O**
  - Support 1 x D-Sub 9-pin connector of 8-bit GPIO + 5V power source (4GPI+4GPO)

1.2.8. Storage

- **Flash Interface**
  - AMOS-3002-1D10A1
    Support 1 x CFast Flash Disk Socket as default

- **HDD**
  - Optional support 1 x 2.5" Hard Disk Drive bay by extended chassis of AMOS-3002-2D10A1

1.2.9. System Indicator

- **Power Status LED**
  - 1 x Green color LED

- **HDD Activity LED**
  - 1 x Red color LED

1.2.10. Watch Dog Timer

- **Output**
  - System reset
- **Interval**
  - Programmable 1~255 sec

1.2.11. Expansion

- **Mini PCIe**
  - AMOS-3002-1D10A1
    1 x MiniPCIe Slot
- **SIM**
  - AMOS-3002-1D10A1
    1 x SIM Slot

1.2.12. Front Panel External I/O connectors

- 2 x COM D-Sub 9-pin connectors
- 2 x USB ports of min-DIN connectors
- 2 x Lockable USB ports for secure connection
- 1 x 3.5Φ Audio Jack as Speaker-out
- 1 x 3.5Φ Audio Jack as Line-in
- 1 X HDD & PWR LED
- 1 x 8-bit GPIO D-sub 9-pin connector via cable connection to P900, 2x5 2.0mm pin header

- 1 x CFast flash disk slot
- 1 x SIM slot

1.2.13. Rear Panel External I/O connectors

- 1 x VGA connector
  - D-Sub 15-pin female connector
- 2 x USB ports of min-DIN connectors
- 2 x RJ45 connectors of Gigabit Ethernet LAN ports (for AMOS-3002-1D10A1)
- 1 x HDMI® connector
- 3 x Antenna hole for 3G, GPS and WLAN (for AMOS-3002-1D10A1)

1.2.14. Power Supply

- **Input Voltage**
  - Accept Power Input of DC 12V +/-5%
  - Typical Power Input 12 VDC @1.8A
- **Power Input Connector**
  - DC Power Input connector by 2-pole Phoenix connector
- **Power Consumption**
  - Typical 20W for AMOS-3002-1D10A1

1.2.15. Mechanical

- **Construction**
  - Aluminum Top Cover
  - Metal Chassis Housing
  - Removable left & right of wall mountable bracket
- **Mounting**
  - Wall/VESA mountable
- **Dimensions (W x H x D)**
  - 197 (w) x 49 (H) x 104 mm (D)
- **Weight**
  - 1.4 kg (3.08lbs)

1.2.16. Environmental Specification

- **Operation Temperature**
  - -20 ˚C up to 60˚C for 1.0GHz VIA Eden™ X2 Processor (for P/N:AMOS-3002-1D10A1)
  - 0 °C ~ 45°C when system equipped with 2.5" Hard Disk Drive (for P/N: AMOS-3002-2D10A1)
- **Storage Temperature**
  - -20 °C ~ 70 °C
- **Relative Humidity**
  - 0 ~ 90% @ 45 °C, non-condensing
- **Vibration Loading During Operation**
  - With CFast Flash disk: 5Grms, IEC 60068-2-64, random, 5 ~ 500Hz, 1 Oct./min, 1hr/axis
- **Shock During Operation**
  - With CFast Flash disk: 50G, IEC 60068-2-27, half size, 11ms duration
- **EMC Approved**
  - CE, FCC Class A, CCC

1.2.17. Software Compatibility

- **Operating System**
  - Microsoft Windows 7
  - Microsoft Windows XP
  - Microsoft Windows Embedded Standard
  - Microsoft Windows Embedded Standard 7
  - Linux

1.3. Product Dimensions

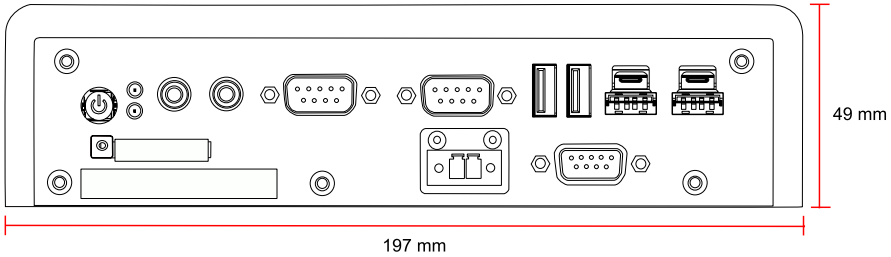


Figure 1: AMOS-3002 Dimensions - Front view

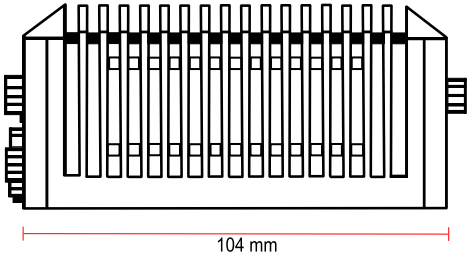


Figure 2: AMOS-3002 Dimensions - Side view

2. I/O Interface

The AMOS-3002 has a wide selection of interfaces integrated into the board. It includes a selection of frequently used ports as part of the external I/O coastline.

2.1. External I/O Ports

The AMOS-3002 has external I/O ports placed along both faces of the chassis.

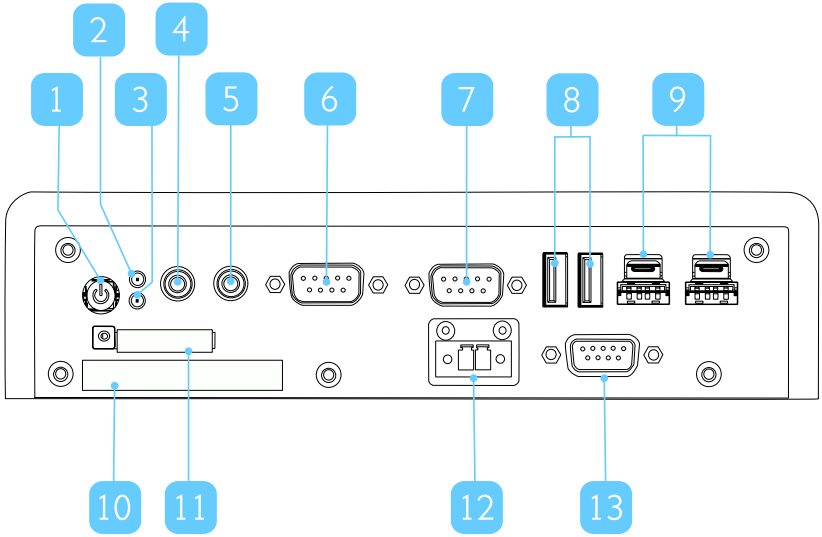


Figure 3: Front I/O panel

Item	Description	Item	Description
1	Power button (On/Off)	8	USB 2.0 ports
2	HDD LED indicator	9	Lockable USB 2.0 ports
3	Power LED indicator	10	CFast socket (available for AMOS-3002-1D10A1)
4	Mic-In	11	SIM socket (available for AMOS-3002-1D10A1)
5	Line-Out	12	DC power input connector
6	COM1 connector	13	DIO connector
7	COM2 connector		

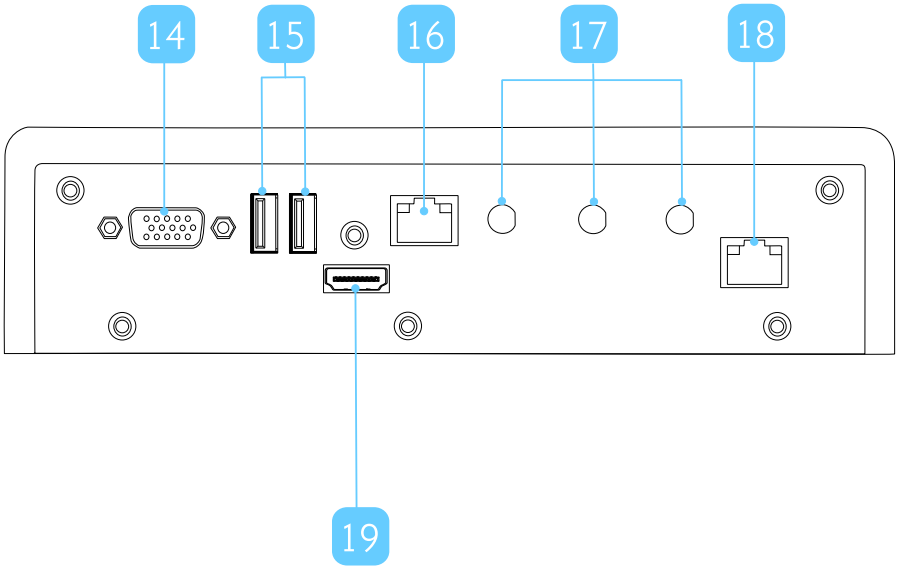


Figure 4: Rear I/O panel

Item	Description	Item	Description
14	VGA connector	17	3G, GPS and WLAN antenna holes (available for AMOS-3002-1D10A1)
15	USB 2.0 ports	18	Gigabit Ethernet port 2 (LAN2) (available for AMOS-3001-1D10A1)
16	Gigabit Ethernet port 1 (LAN1)	19	HDMI port

2.1.1. Power Button

The AMOS-3002 comes with a power button on the front panel that supports two functions: soft power on/off (instant off or delay 4 seconds), and suspend.

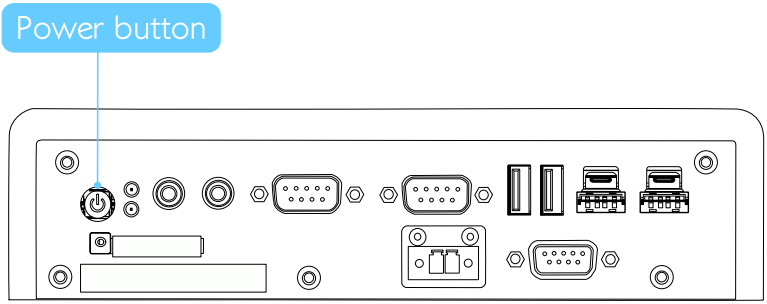


Figure 5: Power button diagram

2.1.2. DC-In Power Input Connector

The AMOS-3002 comes with a 2-pole Phoenix connector on the front panel that carries $12V_{DC}$ external power input.

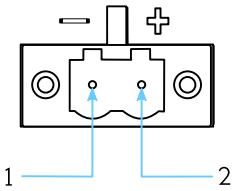


Figure 6: Power input connector pinout diagram

Pin	Signal
1	GND
2	12VDC

Table 1: Power input connector pinout

2.1.3. LED Indicators

There are two LEDs on the front panel of the AMOS-3002 that indicate the status of the system:

- PWR LED is green and indicates the status of the system's power status.
- HDD LED is red and indicates any storage activity for the CFast disk.

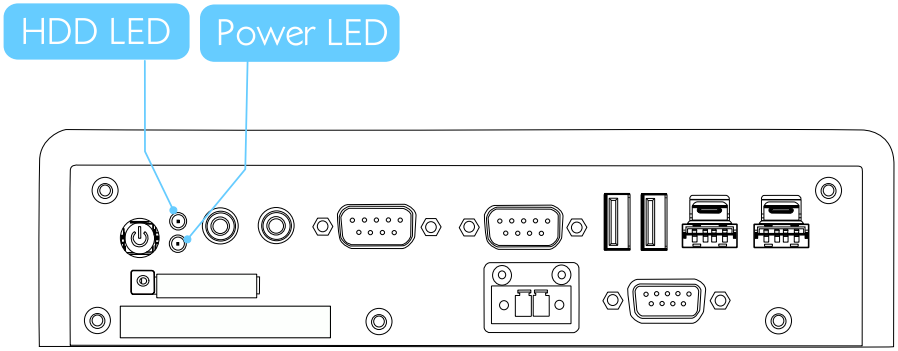


Figure 7: System LED indicators

2.1.4. Audio Jacks

The AMOS-3002 has two 3.5mm TRS audio jacks for Mic-In and Line-Out on the front panel. The MIC-In jack is for connecting to a microphone while the Line-Out jack is for connecting to external speakers or headphones.

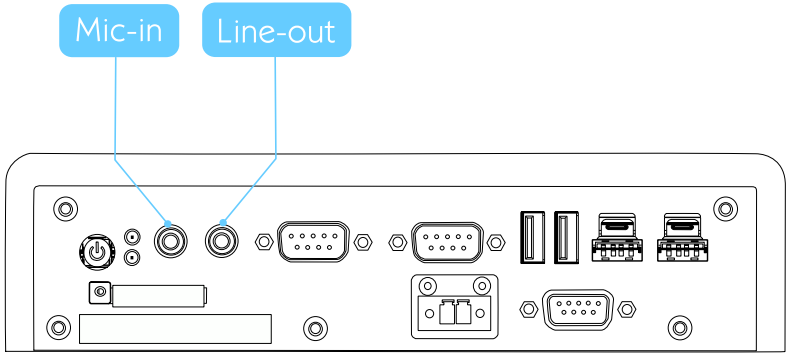


Figure 8: Audio jack receptacle stack

Jack	Description
Mic-In	TRS jack, 3.5mm Ø 5P, 90 Degree, Female, shielded
Line-Out	TRS jack, 3.5mm Ø 5P, 90 Degree, Female, shielded

Table 2: Audio jack receptacle pinout

2.1.5. COM Connector

The AMOS-3002 has two D-sub 9-pin male connectors named COM1 and COM2. The COM1 and COM2 connectors can be configured as RS-232, RS-422, or RS-485. However, the default setting of COM1 and COM2 connectors is RS-232. To configure the COM connectors, user needs to setup the BIOS.

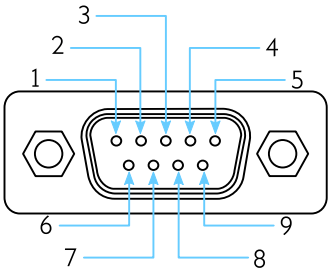


Figure 9: COM connector pinout diagram

Pin	RS-232 Signal	RS-422 Signal	RS-485 Signal
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Table 3: COM connector pinout

2.1.6. USB 2.0 Ports

The AMOS-3002 has two external USB ports (USB1 and USB2) on the front panel. Each USB port gives complete Plug and Play and hot swap capability for external devices. The USB interface complies with USB UHCI, Rev. 2.0.

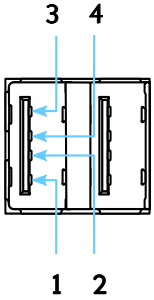


Figure 10: USB 2.0 port pinout diagram

USB1		USB2	
Pin	Signal	Pin	Signal
1	VCC	1	VCC
2	USB data -	2	USB data -
3	USB data +	3	USB data +
4	GND	4	GND

Table 4: USB 2.0 port pinout

2.1.7. Lockable USB 2.0 Ports

The AMOS-3002 has two lockable USB ports (USB1 and USB2) on the front panel. Each USB port gives complete Plug and Play and hot swap capability for external devices. The USB interface complies with USB UHCI, Rev. 2.0. Lockable USB port is specially designed to secure USB connection.

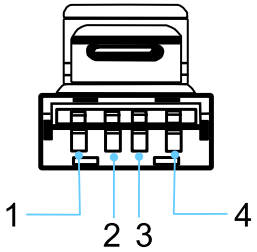


Figure 11: Lockable USB port pinout diagram

USB1		USB2	
Pin	**Signal**	**Pin**	**Signal**
1	VCC	1	VCC
2	USB data -	2	USB data -
3	USB data +	3	USB data +
4	GND	4	GND

Table 5: Lockable USB port pinout

Note:
Gently lift the tab before removing the USB from the lockable port.

2.1.8. SIM socket

The AMOS-3002 has SIM socket located on the front panel.

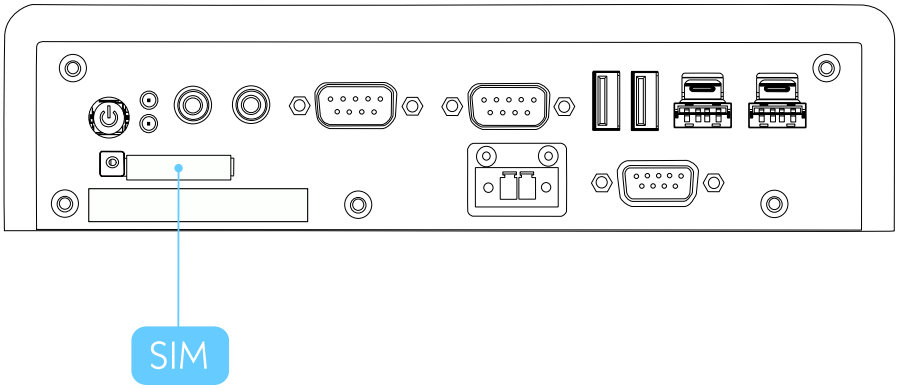


Figure 12: CFast socket diagram

2.1.9. CFast Socket

The AMOS-3002 has CFast socket located on the front panel. The CFast socket is compatible with Type I and Type II.

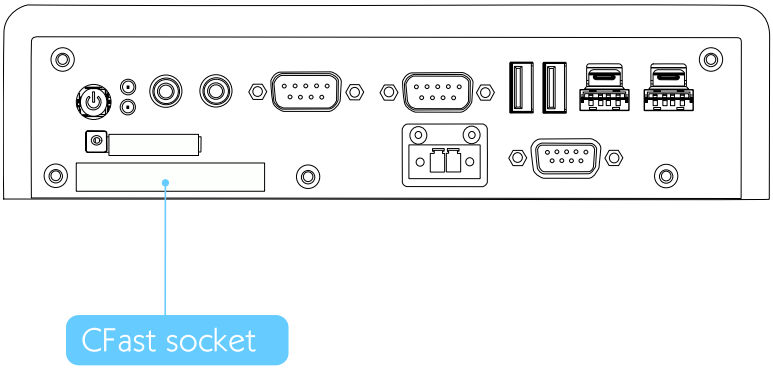


Figure 13: CFast socket diagram

2.1.10. DIO

AMOS-3002 provides one D-sub 9-pin female connector, which offers Digital IO communication interface port.

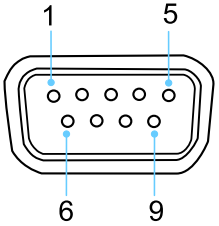


Figure 14: DIO port pinout diagram

Pin	Signal
1	GPIO32
2	GPI4
3	GPO12
4	GPI5
5	GPIO9
6	GPI9
7	GPIO12
8	GPI8
9	+5V

Table 6: DIO port pinout

2.1.11. VGA Connector

The AMOS-3002 provides a high resolution VGA interface through DE-15 female connector on the rear I/O panel. It supports resolutions up to 2560 x 1600. The pinout of the VGA connector is shown below.

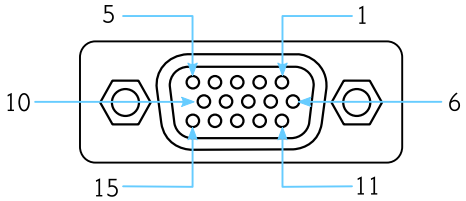


Figure 15: VGA connector pinout diagram

Pin	Signal	Pin	Signal	Pin	Signal
1	RED	6	Ground	11	NC
2	GREEN	7	Ground	12	DDC_SPD
3	BLUE	8	Ground	13	HSync
4	NC	9	+5V	14	VSync
5	Ground	10	Ground	15	DDC_SCL

Table 7: VGA connector pinout

2.1.12. Gigabit Ethernet Port

The AMOS-3002 system is equipped with two Gigabit Ethernet ports (LAN1 and LAN2) on rear I/O panel. Both ports are fully compliant with IEEE 802.3 (10BASE-T), 802.3u (100BASE-TX), and 802.3ab (1000BASE-T) standards. The pinout of the LAN1 and LAN2 ports are shown below.

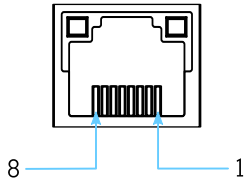


Figure 16: Gigabit Ethernet port pinout diagram

LAN1			LAN2	
Pin	Signal		Pin	Signal
1	LAN1_TD0+		1	LAN2_TD0+
2	LAN1_TD0-		2	LAN2_TD0-
3	LAN1_TD1+		3	LAN2_TD1+
4	LAN1_TD1-		4	LAN2_TD1-
5	LAN1_TD2+		5	LAN2_TD2+
6	LAN1_TD2-		6	LAN2_TD3-
7	LAN1_TD3+		7	LAN2_TD3+
8	LAN1_TD3-		8	LAN2_TD3-

Table 8: Gigabit Ethernet port pinout

Both LAN1 and LAN2 are equipped with two LED indicators located to show its active/link status and speed status.

LAN LED Status		
	Link LED (Left LED on RJ-45 port)	Active LED (Right LED on RJ-45 port)
Active	The LED is always On, different LED colors represent LAN connection speed.	Flash in Orange color
Link	The LED is always On, different LED colors represent LAN connection speed.	LED is off
Speed_10Mbit	The LED is always On in Orange color	Flash in Orange color
Speed_100 Mbit	The LED is always On in Green color	Flash in Orange color
Speed_1000 Mbit	The LED is always On in Red color	Flash in Orange color

2.1.13. HDMI® Port

The AMOS-3002 has one HDMI® port (19-pin HDMI® Type A receptacle) connector. The HDMI® port is for connecting to HDMI® displays. The pinout of the HDMI® port is shown below.

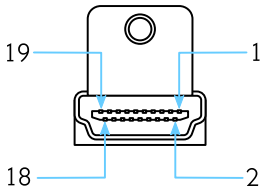


Figure 17: HDMI port pinout diagram

Pin	Signal	Pin	Signal
1	HDMITX2+	2	GND
3	HDMITX2-	4	HDMITX1+
5	GND	6	HDMITX1-
7	HDMITX0+	8	GND
9	HDMITX0-	10	HDMITXC+
11	GND	12	HDMITXC-
13	CEC	14	NC
15	SPCLK	16	SPDAT
17	GND	18	PVDD5
19	-DP1_HPD		

Table 9: HDMI port pinout

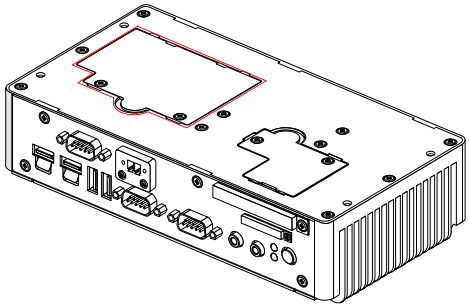
3. Hardware Installation

This chapter provides you with information about hardware installation procedures. It is recommended to use a grounded wrist strap before handling computer components. Electrostatic discharge (ESD) can damage some components.

3.1. How to install SODIMM memory module

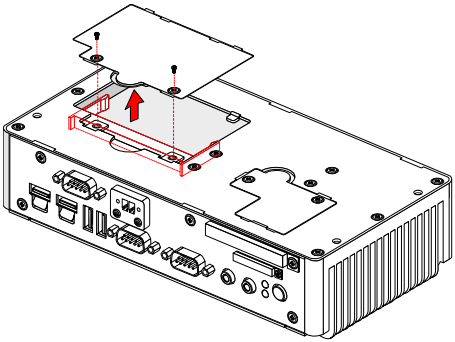
Step 1

Flip over the AMOS-3002, a memory access cover is located at the bottom side of the unit.



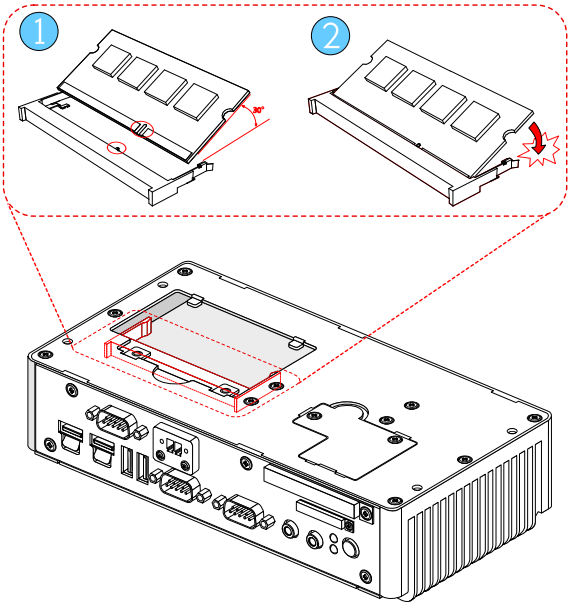
Step 2

Remove the 2 screws from the memory access cover and lift up the cover.



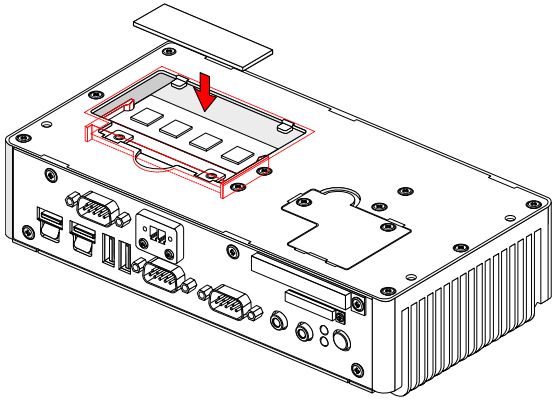
Step 3

Insert the memory module into the SODIMM socket at the 30 degree angle. Then push down until the memory module snaps into place. The SODIMM socket has two locking mechanisms that will click once the memory module has been fully inserted.



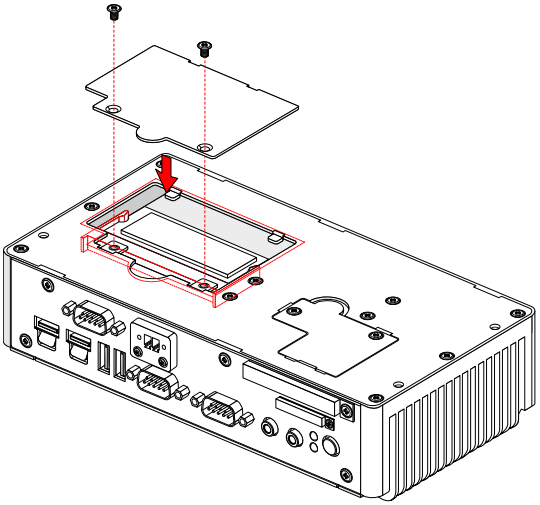
Step 4

Install the memory thermal pad on the memory module.



Step 5

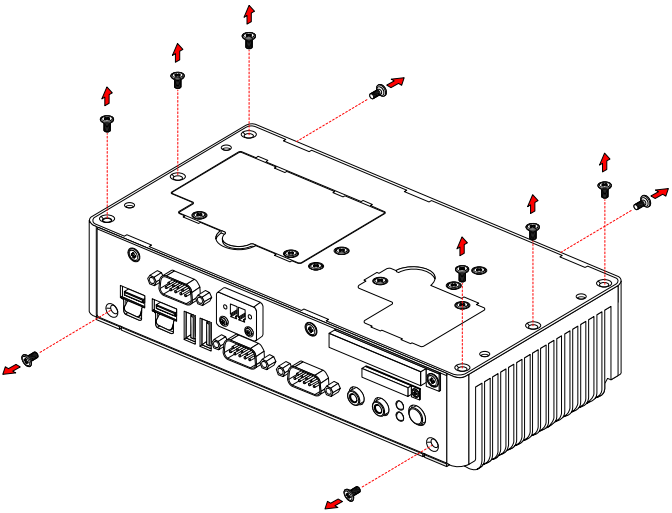
Align the memory access cover with the mounting holes on the chassis. Secure the memory access cover in place with two screws.



3.2. How to remove the cover

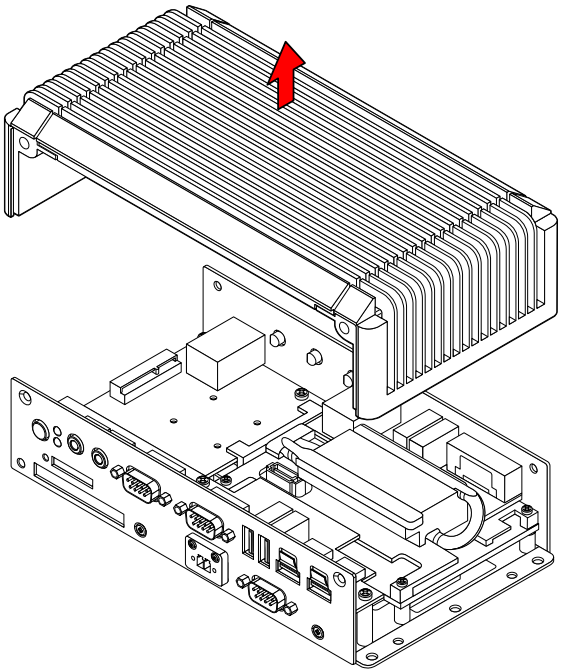
Step 1

Flip over the AMOS-3002 unit. Remove the ten screws from the bottom side and both face plates as indicated in the figure below.



Step 2

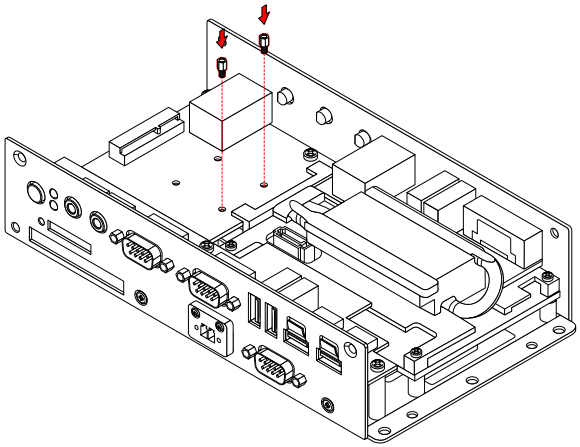
Turn it back to the top side and lift up the cover slowly and carefully.



3.3. How to install 3G and GPS kit

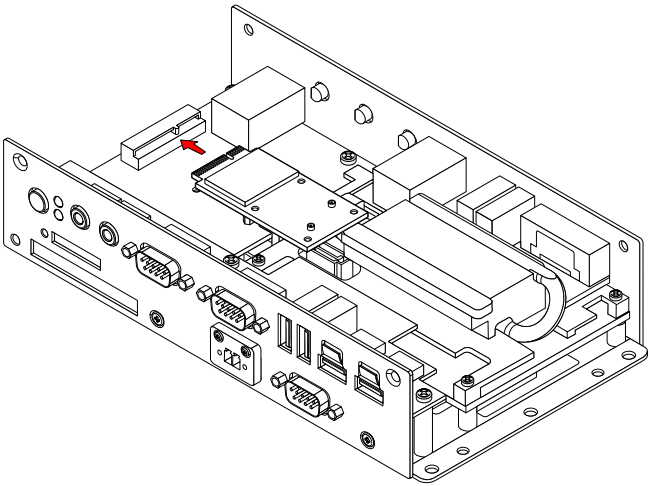
Step 1

Screw in the hex stand screws (x2) to the daughterboard.



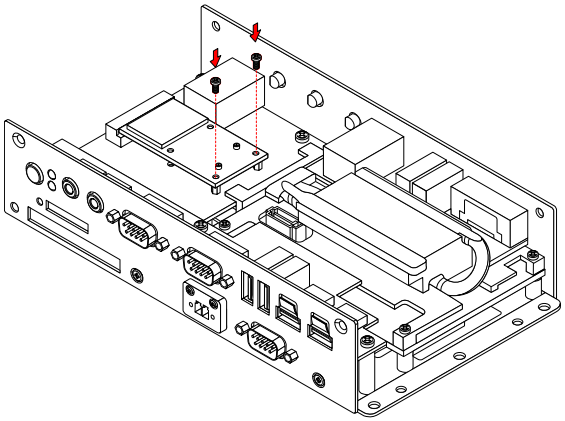
Step 2

Align the notch on the miniPCIe module with the notch on the Mini-PCIe slot then insert the module at 30° angle.



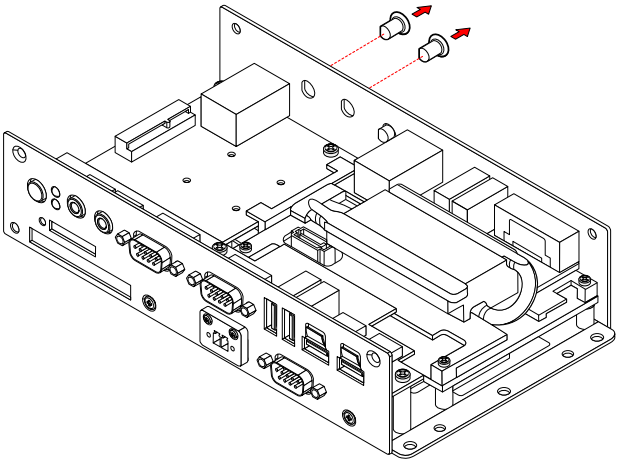
Step 2

Once the module has been fully inserted, push down the module until the screw holes align with the mounting holes on the hex spacer screws. Secure the module with two screws to the standoffs.



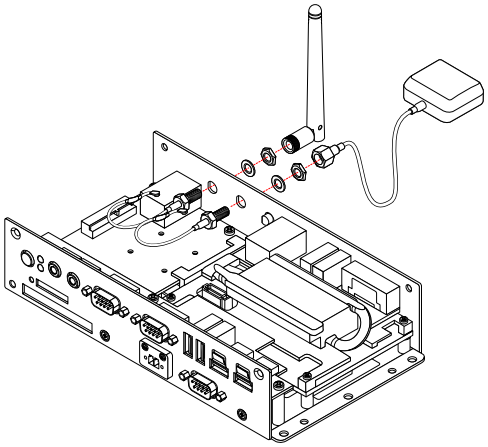
Step 3

Remove the 3G and GPS antenna hole covers from the rear chassis. To facilitate removing the cover, use a pair of needle-nose pliers to depress both locking clips simultaneously.



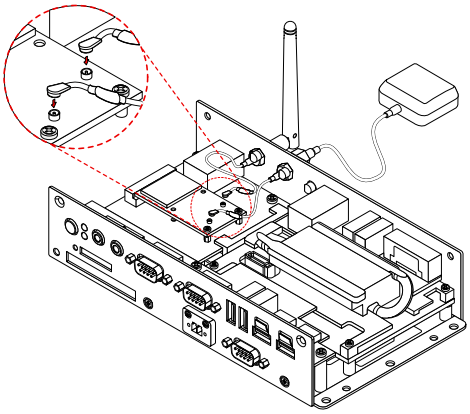
Step 4

Insert the antenna cables into the 3G and GPS antenna holes from the inside. Make sure the flat side of the antenna jack matches the flat side of the antenna hole. Secure the 3G and GPS antenna jack to the chassis with the toothed washer and nut.



Step 5

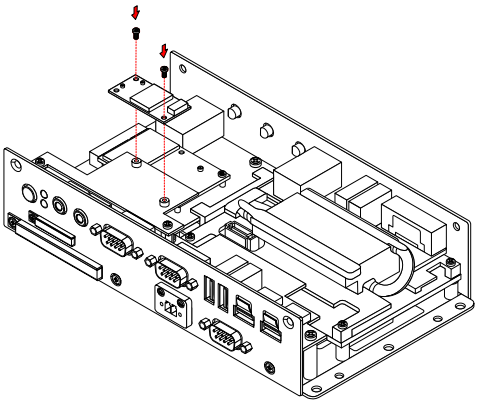
Connect the mini-coaxial cables of the 3G and GPS port connectors to the mini RF connectors on the 3G and GPS miniPCIe module.



3.4. How to install WLAN kit

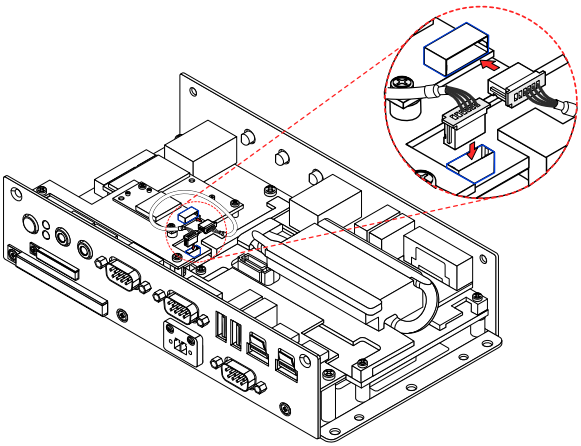
Step 1

Secure the WLAN module with two screws to the standoffs.



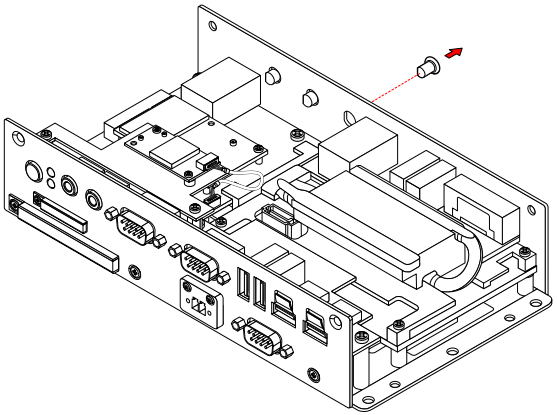
Step 2

Attach the board-to-board cable to the Wi-Fi USB connector on the P900-B daughterboard. Gently attach the other end of the board-to-board cable to the Wi-Fi mini connector on the Wi-Fi module.



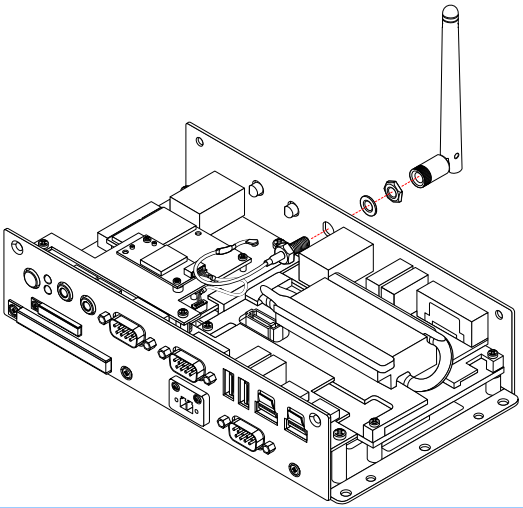
Step 3

Remove the Wi-Fi antenna hole cover from the rear chassis. To facilitate removing the cover, use a pair of needle-nose pliers to depress both locking clips simultaneously



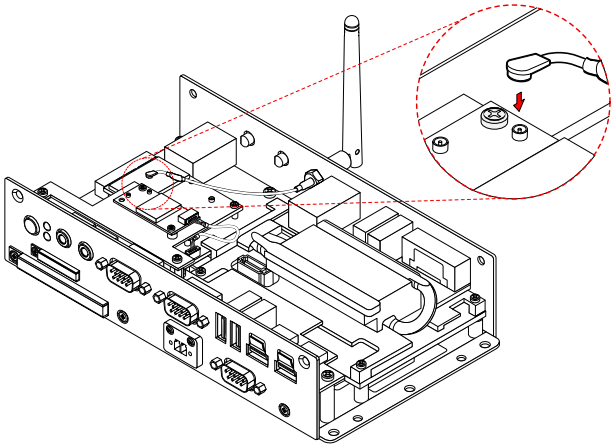
Step 4

Insert the antenna cable (provided with the WLAN kit) into the WLAN antenna hole from the inside. Make sure the flat side of the antenna jack matches the flat side of the antenna hole.



Step 5

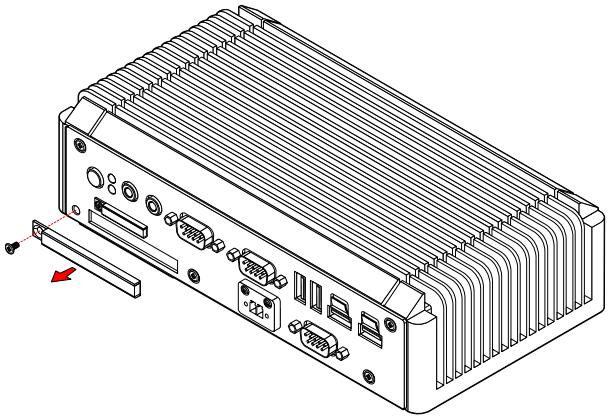
Connect the mini-coaxial cable of the WLAN port connector to the mini RF connector on the WLAN module.



3.5. How to install CFast Card

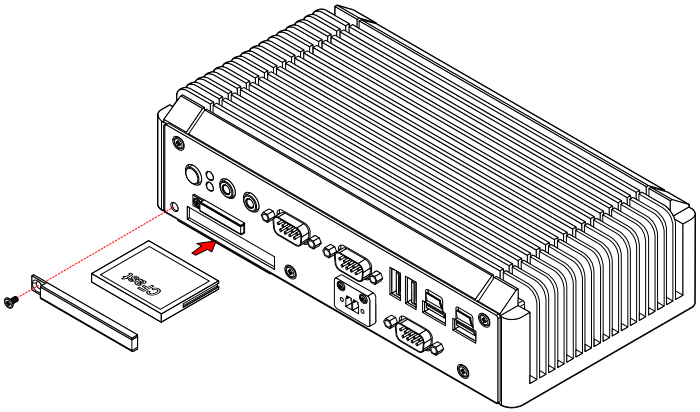
Step 1

Remove the CFast card cover from the front chassis plate.



Step 2

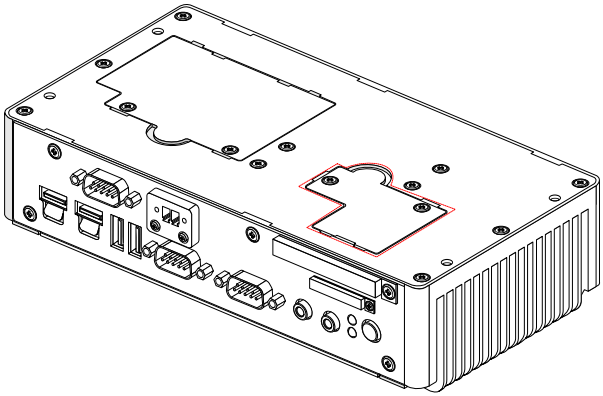
Insert the CFast card into the CFast socket. Ensure the orientation is correct before inserting the card. Install back the CFast socket cover and secure it with screw.



3.6. How to install CFast thermal pad

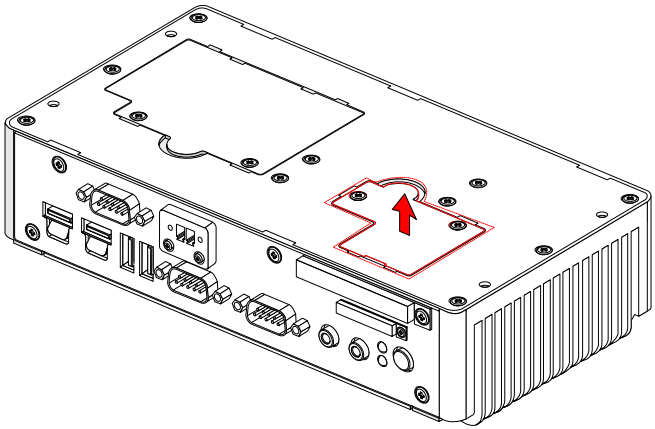
Step 1

Flip over the AMOS-3002, a CFast access hole is located at the bottom side of the unit.



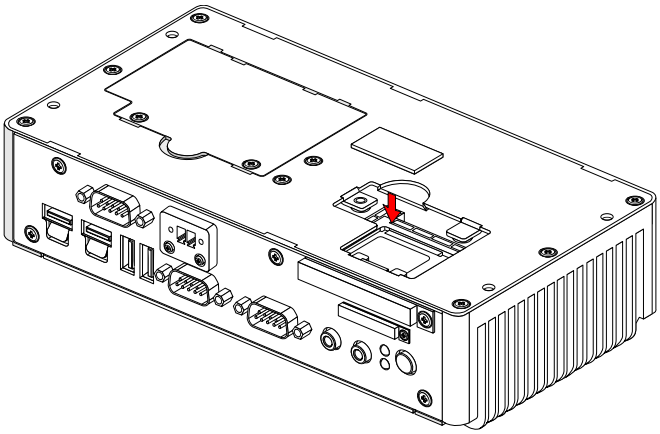
Step 2

Remove the 2 screws from the CFast access hole cover and lift up the cover.



Step 3

Install the CFast thermal pad in the CFast access hole.



Step 4

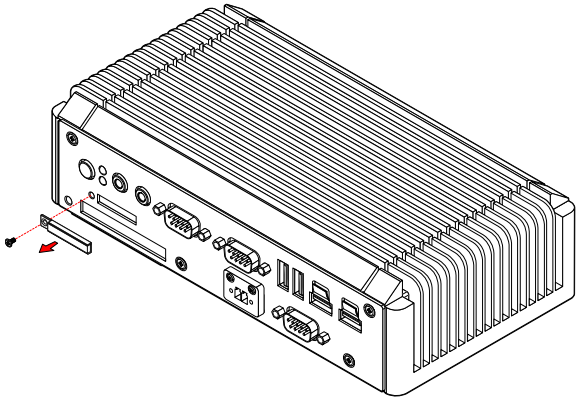
Align the CFast access hole cover with the mounting holes on the chassis. Secure the CFast access hole cover in place with two screws.

Note:
Before removing the CFast Card, remember to take off the thermal pad first.

3.7. How to install SIM Card

Step 1

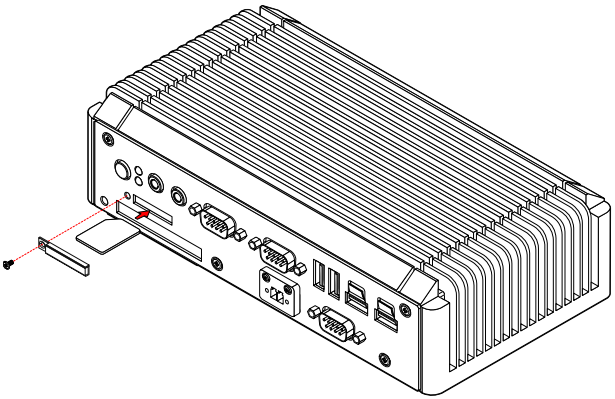
Remove the SIM card cover from the front chassis plate.



Note:
Please unplug the power first before inserting the SIM card, otherwise it may cause malfunction to the device.

Step 2

Insert the SIM card into the SIM socket. Ensure the orientation is correct before inserting the card. Install back the SIM socket cover and secure it with screw.



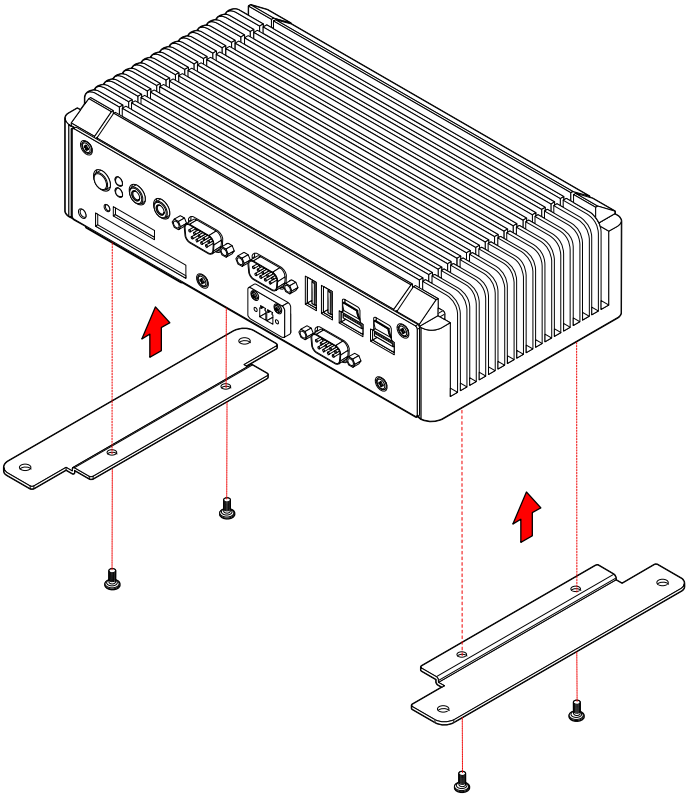
3.8. How to install the Mounting Brackets

Step 1

Prepare the left and right brackets and the four screws.

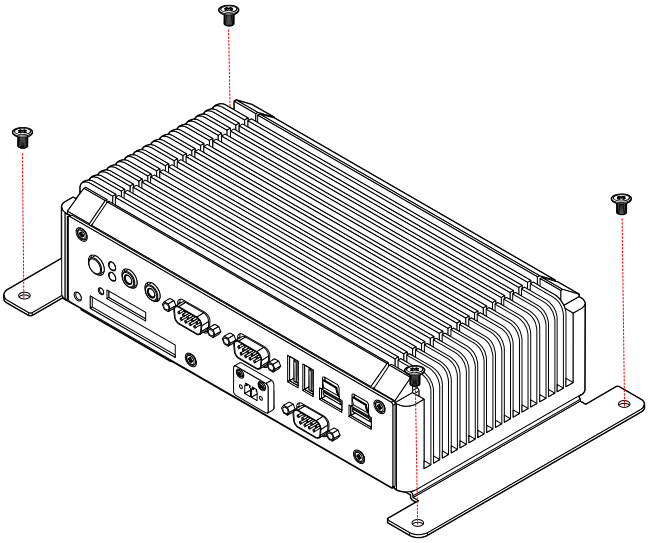
Step 2

Fasten the mounting brackets to bottom side of the AMOS-3002 chassis by using 4 screws (M3x6) as shown below.



Step 3

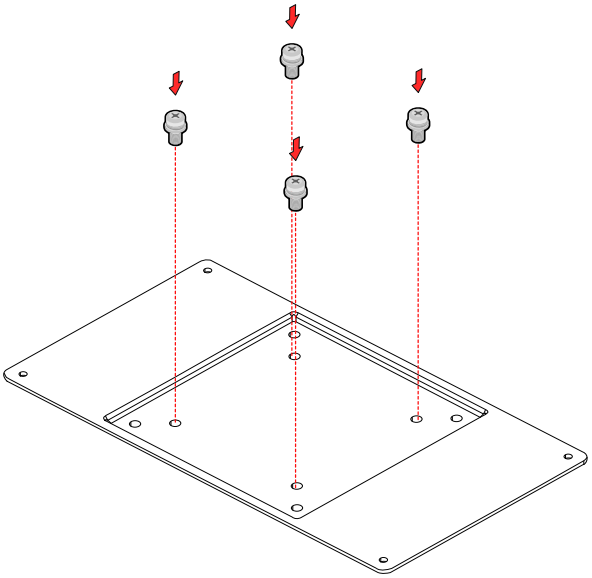
Secure both mounting brackets to the wall/table with four screws (M4X8).



3.9. How to install the VESA plate

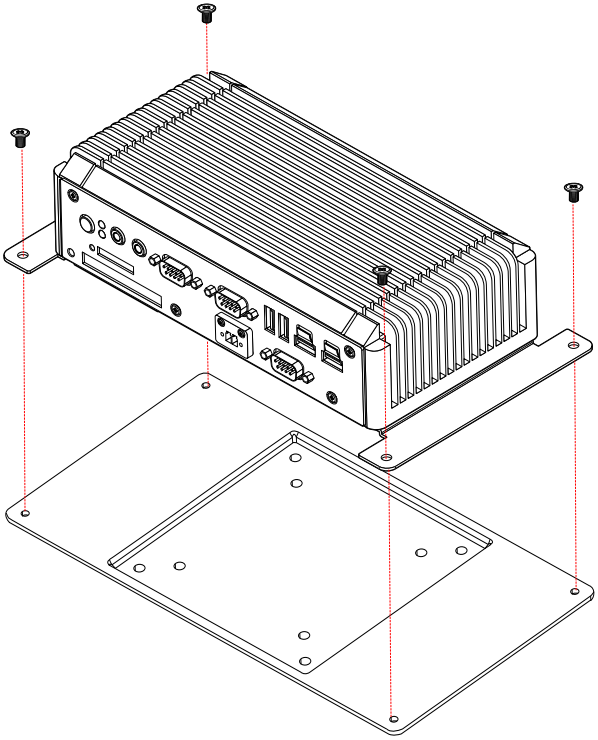
Step 1

Fasten the VESA mounting plate to a VESA mountable device with four screws.



Step 2

Secure the mounting brackets to the VESA mounting plate with four screws.



4. BIOS Setup

This chapter gives a detailed explanation of the BIOS setup functions.

4.1. Entering the BIOS Setup Menu

Power on the computer and press **Delete** during the beginning of the boot sequence to enter the BIOS setup menu. If you missed the BIOS setup entry point, restart the system and try again.

4.2. Control Keys

Up Move up one row

Down Move down one row

Left Move to the left in the navigation bar

Right Move to the right in the navigation bar

Enter Access the highlighted item

Esc Jumps to the Exit screen or returns to the previous screen

+[1] Increase the numeric value

-[1] Decrease the numeric value

F1 General help[2]

F7 Discard changes

F9 Load optimized defaults

F10 Save all the changes and exit

Note:

1. Must be pressed using the 10-key pad.
2. The General help contents are only for the Status Page and Option Page setup menus.

4.3. Getting Help

The BIOS Setup Utility provides a "General Help" screen. This screen can be accessed at any time by pressing **F1**. The help screen displays the keys for using and navigating the BIOS Setup Utility. Press **Esc** to exit the help screen.

4.4. System Overview

The System Overview screen is the default screen that is shown when the BIOS Setup Utility is launched. This screen can be accessed by traversing the navigation bar to the "Main" label.

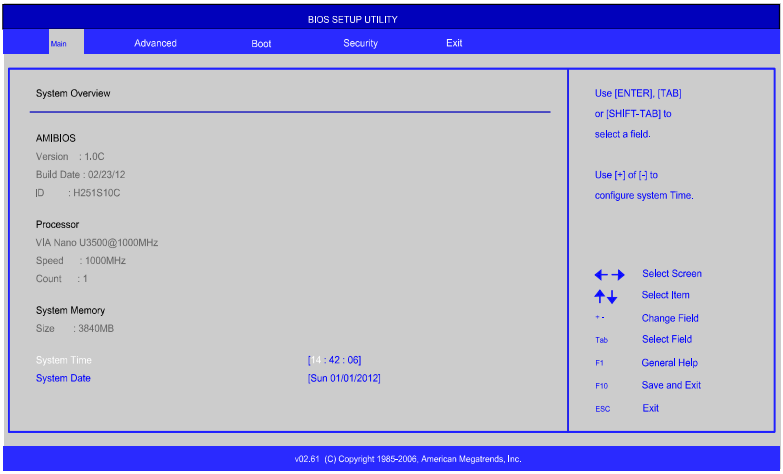


Figure 18: Illustration of the Main menu screen

4.4.1. AMIBIOS

The content in this section of the screen shows the current BIOS version, build date, and ID number.

4.4.2. Processor

This content in this section shows the CPU information that has been detected.

4.4.3. System Memory

This section shows the amount of available memory that has been detected.

4.4.4. System Time

This section shows the current system time. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the hour, minute, and second segments. The **+** and **-** keys on the number pad can be used to change the values. The time format is [Hour : Minute : Second].

4.4.5. System Date

This section shows the current system date. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the month, day, and year segments. The **+** and **-** keys on the number pad can be used to change the values. The weekday name is automatically updated when the date is altered. The date format is [Weekday, Month, Day, Year].

4.5. Advanced Settings

The Advanced Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.

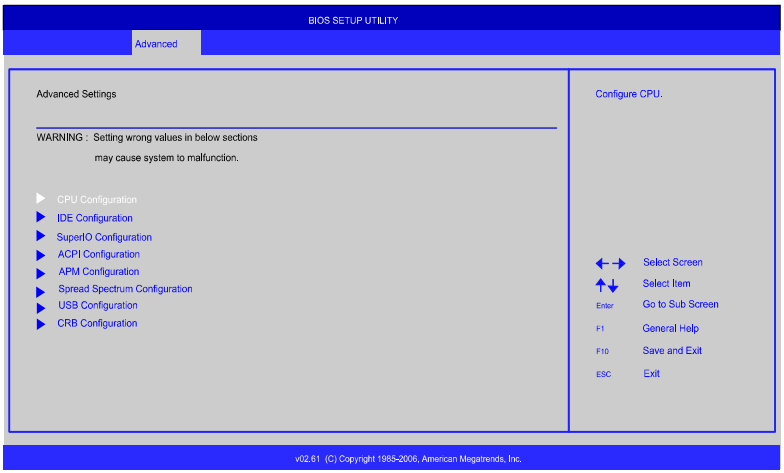


Figure 19: Illustration of the Advanced Settings screen

The Advanced Settings screen contains the following links:

- CPU Configuration
- IDE Configuration
- SuperIO Configuration
- ACPI Configuration
- APM Configuration
- Spread Spectrum Configuration
- USB Configuration
- CRB Configuration

4.5.1. CPU Configuration

The CPU Configuration screen shows detailed information about the built-in processor.

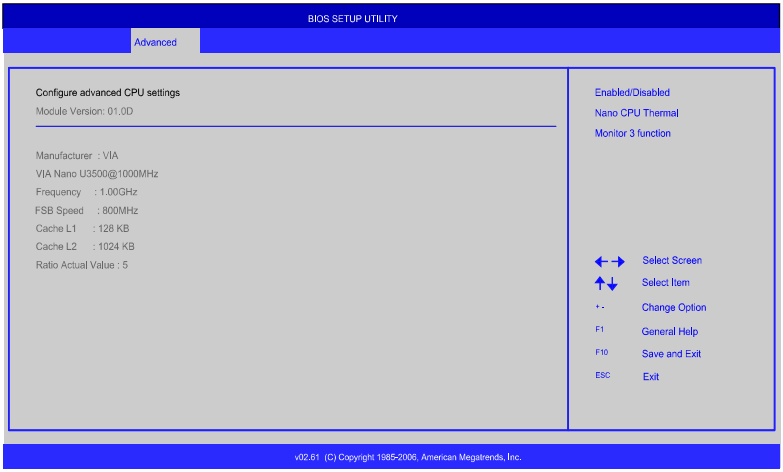


Figure 20: Illustration of the CPU Configuration screen

4.5.2. IDE Configuration

The IDE Configuration screen shows links to the primary master and slave IDE hard drive information screens.

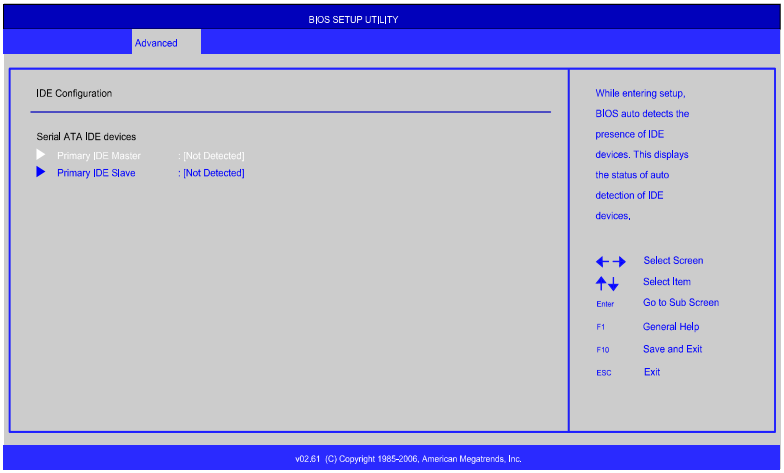


Figure 21: Illustration of IDE Configuration screen

Available submenus include the following:

Primary IDE Master

Primary IDE Slave

4.5.3. SuperIO Configuration

The SuperIO Configuration screen shows the specific addresses and IRQs of the onboard serial ports.

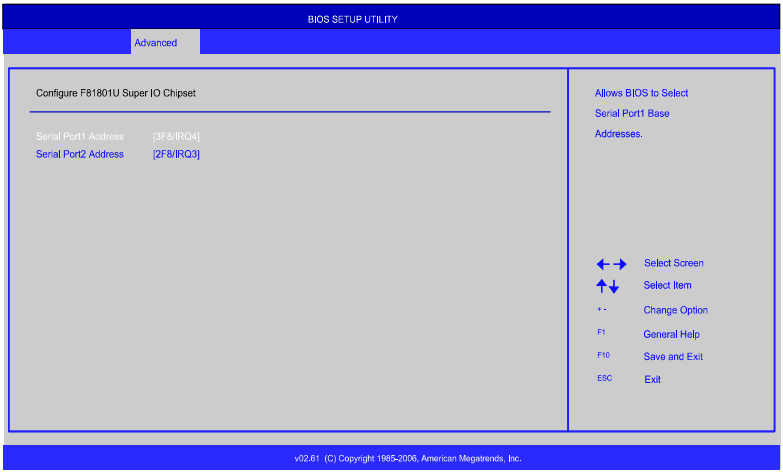


Figure 22: Illustration of SuperIO Configuration screen

4.5.3.1. Serial Ports 1 to 2

Serial Port1 Address

3F8/IRQ4, 3E8/IRQ4, 2E8/IRQ3, Disabled.

Serial Port2 Address

2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Disabled.

4.5.4. ACPI Configuration

ACPI grants the operating system direct control over system power management. The ACPI Configuration screen can be used to set a number of power management related functions.

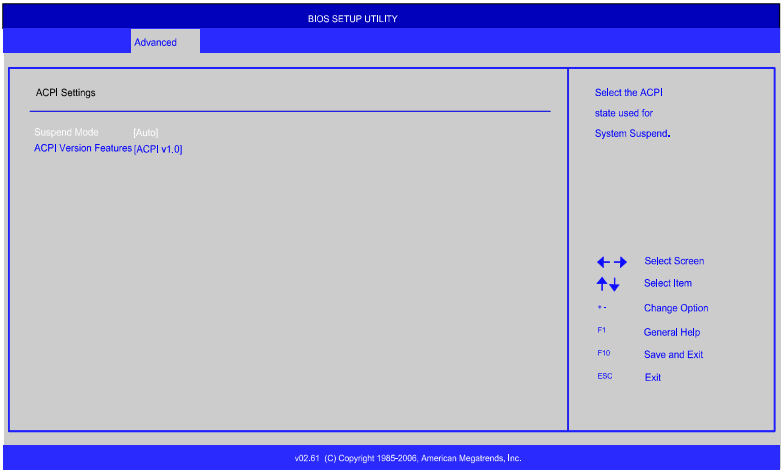


Figure 23: Illustration of ACPI Configuration screen

4.5.4.1. Suspend Mode

The Suspend Mode field has three selectable options.

S1(POS)

S1/Power On Suspend (POS) is a low power state. In this state, no system context (CPU or chipset) is lost and hardware maintains all system contexts.

S3(STR)

S3/Suspend To RAM (STR) is a power-down state. In this state, power is supplied only to essential components such as main memory and wakeup-capable devices. The system context is saved to main memory, and context is restored from the memory when a "wakeup" event occurs.

Auto

When the Suspend Mode is set to Auto, the operating system will control the power state.

4.5.4.2. ACPI Version Features

The ACPI Version Features enables the BIOS to support the designated ACPI specification. There are three versions to choose from: ACPI v1.0, ACPI v2.0, and ACPI v3.0.

4.5.5. APM Configuration

APM enables the operating system to co-work with the BIOS to control the system power management. The APM Configuration screen can be used to set a number of power management functions.

Figure 24: Illustration of APM Configuration screen

4.5.5.1. Power Button Mode

The Power Button Mode has three options.

On/Off

When On/Off is selected, pressing the power button will instantly cause the system to power on or off.

Standby

When Standby is selected, the power button must be pressed and held down for 4 seconds before the system will power off.

Suspend

When Suspend is selected, pressing the power button will instantly cause the system to enter suspend mode.

4.5.5.2. Restore on AC/Power Loss

Restore on AC/Power Loss defines how the system will respond after AC power has been interrupted while the system is on. There are three options.

Power Off

The Power Off option keeps the system in an off state until the power button is pressed again.

Power On

The Power On option restarts the system when the power has returned.

Last State

The Last State option restores the system to its previous state when the power was interrupted.

4.5.5.3. Resume on LAN

Resume on LAN wakes up a system that has been put into suspend or standby mode. When this feature is enabled, the system can be restored to an active state when a PCIE wake up signal is detected on the LAN.

4.5.5.4. Resume on RTC Alarm

Resume on RTC Alarm can only be used if **Resume on Software RTC Alarm** is not enabled. This feature enables the BIOS to automatically power on the system at a scheduled time. When enabled, the **RTC Alarm Date** and **System Time** features will be unlocked.

4.5.5.5. RTC Alarm Date (Days)

The RTC Alarm Date feature is visible only when **Resume on RTC Alarm** is enabled. This feature enables the user to specify a specific date each month or daily recurrence. Use the **+** and **-** keys on the number pad to change the value of the RTC Alarm Date.

Every Day

The Every Day option triggers the RTC Alarm daily.

1 – 31

When a specific numeric date is selected, the RTC Alarm will be triggered on that day of the month.

4.5.5.6. System Time

The System Time option enables the user to specify the time the system should power on for the date that is set in **RTC Alarm Date**.

4.5.6. Spread Spectrum Configuration

The Spread Spectrum Configuration screen enables access to the CPU Spread Spectrum Setting feature.

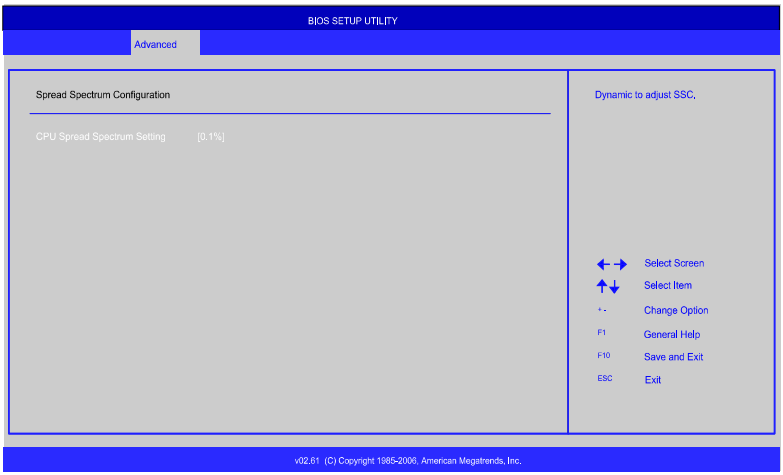


Figure 25: Illustration of CPU Spread Spectrum Configuration screen

4.5.6.1. CPU Spread Spectrum Setting

The CPU Spread Spectrum Setting feature enables the BIOS to modulate the clock frequencies originating from the mainboard. The settings are in percentages of modulation. Higher percentages result in greater modulation of clock frequencies. This feature has settings that range from 0.1% to 0.9%.

4.5.7. USB Configuration

The USB configuration page detects all connected USB device.

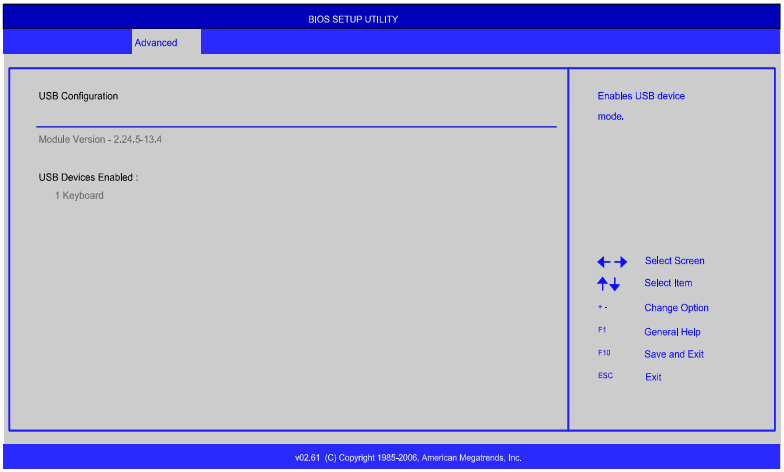


Figure 26: Illustration of USB Configuration screen

4.5.8. CRB Configuration

The CRB Configuration screen includes chipset settings.

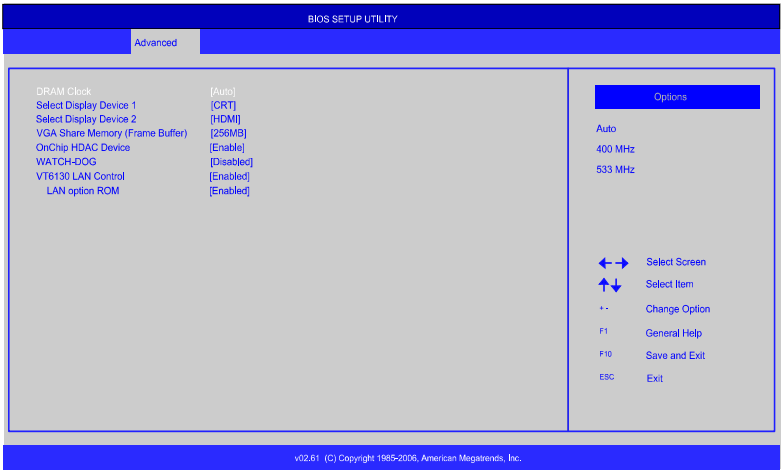


Figure 27: Illustration of CRB Configuration screen

4.5.8.1. DRAM Clock

The DRAM Clock option enables the user to determine how the BIOS handles the memory clock frequency. The memory clock can either be dynamic or static. This feature has three options.

Auto

The Auto option enables the BIOS to select a compatible clock frequency for the installed memory.

400 MHz

The 400 MHz option forces the BIOS to be fixed at 800 MHz for DDR3 memory modules.

533 MHz

The 533 MHz option forces the BIOS to be fixed at 1066 MHz for DDR3 memory modules.

4.5.8.2. Select Display Device 1 and 2

The Select Display Device feature enables the user to choose a specific display interface. This feature has two options: CRT and HDMI. If both Select Display Device 1 and Select Display Device 2 are set to the same interface, then any display device connected to the other interface will not function. For example, if both Select Display 1 and 2 are set to CRT, then no data will be sent to the HDMI port.

4.5.8.3. VGA Share Memory (Frame Buffer)

The VGA Share Memory feature enables the user to choose the amount of the system memory to reserve for use by the integrated graphics controller. The selections of memory amount that can be reserved are 128MB, 256MB and 512MB.

4.5.8.4. OnChip HDAC Device

The OnChip HDAC Device feature enables the BIOS to control the high definition audio codec in the chipset. This feature has two options: "Enable" or "Disable".

4.5.8.5. WATCH-DOG

The WATCHDOG Timer Enable feature unlocks three other features that enable the BIOS to monitor the state of the system. This feature has two options: "Enabled" or "Disabled".

4.5.8.6. VT6130 LAN Control

The VT6130 LAN Control feature determines whether the onboard LAN controller will be used or not.

4.5.8.7. LAN Option ROM

The LAN Option ROM feature will only be visible if the **VT6130 LAN Control** feature is enabled. If the LAN Option ROM feature is enabled, then the system will load a separate ROM for the LAN controller in order to boot through the Gigabit Ethernet.

4.6. Boot Settings

The Boot Settings screen has two links that goes to the **Boot Settings Configuration** and **Boot Device Priority** screens.

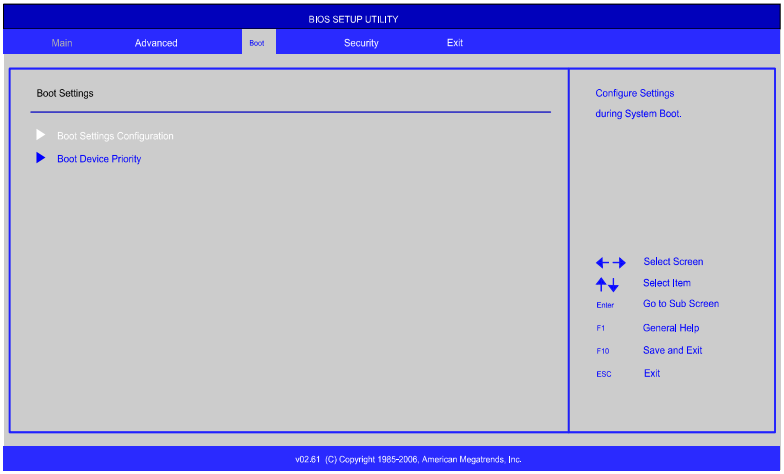


Figure 28: Illustration of Boot Settings screen

4.6.1. Boot Settings Configuration

The Boot Settings Configuration screen has several features that can be run during the system boot sequence.

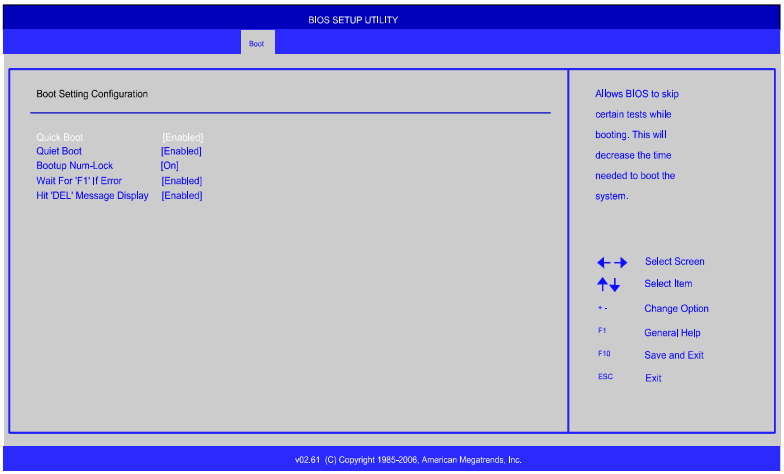


Figure 29: Illustration of Boot Settings Configuration screen

4.6.1.1. Quick Boot

The Quick Boot feature enables the BIOS to skip certain tests in order to speed up the boot sequence. This feature has two options: enabled and disabled.

4.6.1.2. Quiet Boot

The Quiet Boot feature hides all of the Power-on Self Test (POST) messages during the boot sequence. Instead of the POST messages, the user will see an OEM logo. This feature has two options: enabled and disabled.

4.6.1.3. Bootup Num-Lock

The Bootup Num-Lock feature determines how the 10-key pad will behave. When the feature is enabled, the 10-key pad will behave as a number pad. When the feature is disabled, the 10-key pad will behave as cursor navigation keys.

4.6.1.4. Wait for 'F1' if Error

This feature determines how the system will respond if an error is detected during the boot sequence. If this feature is enabled, the BIOS will pause booting and wait for the user to press F1 to enter the BIOS setup menu. This feature has two options: enabled and disabled.

4.6.1.5. Hit 'DEL' Message Display

This feature determines if the BIOS will display a POST message that informs the user how to access the BIOS Setup Utility.[1] This feature has two options: enabled and disabled.

Note:

1. if the Quiet Boot option is enabled, the settings of this feature will have no effect.

4.6.2. Boot Device Priority

The Boot Device Priority screen lists all bootable devices.

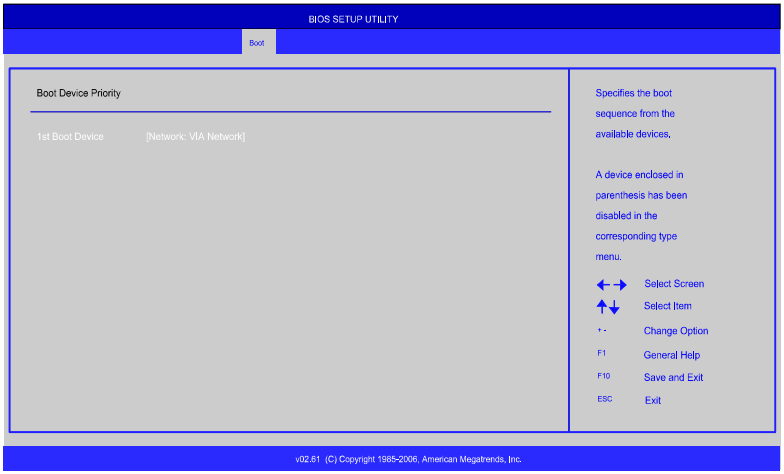


Figure 30: Illustration of the Boot Device Priority screen

4.6.2.1. 1st Boot Device

This feature specifies the boot sequence from the available devices. The available boot devices are detected dynamically and bootable devices will be listed accordingly.

4.7. Security Settings

The Security Settings screen provides a way to restrict access to the BIOS or even the entire system.

Figure 31: Illustration of Security Settings screen

4.7.1. Change Supervisor Password

This option is for setting a password for accessing the BIOS setup utility. When a password has been set, a password prompt will be displayed whenever the BIOS setup utility is launched. This prevents an unauthorized person from changing any part of the system configuration.

When a supervisor password is set, the **Password Check** option will be unlocked.

4.7.2. User Access Level

This feature controls the level of access a user (without the supervisor password) is granted to the BIOS setup utility. This feature has four options.

No Access

The No Access option completely locks the BIOS setup utility. The supervisor password is required to access and change the BIOS settings.

View Only

The View Only option only allows access to view the BIOS settings. Users with this permission level cannot make changes to the BIOS.

Limited

The Limited option only allows non-critical BIOS settings to be changed. Changes are allowed to the following BIOS features:

- System Time
- System Date
- Quick Boot
- Display Logo

Full Access

The Full Access option allows all BIOS settings to be changed except for the Change Supervisor Password and User Access Level options.

4.7.3. Change User Password

This option is for setting a password for non-supervisors. When a user password is set, the **Clear User Password** and **Password Check** options will be unlocked.

4.7.4. Clear User Password

This option is only available when the user accesses the BIOS Setup Utility when the user password has been specified.

4.7.5. Password Check

This feature is compulsory when the **Change Supervisor Password** option is set. The user will have up to three chances to enter the correct password before the BIOS forces the system to stop booting. If the user does not enter the correct password, the keyboard will also lock up. The only way to get past this is to do a hard reboot (i.e., use the system reset button or cut off the power to the system). A soft reboot (i.e., Ctrl+Alt+Del) will not work because the keyboard will be locked. This feature has two options.

Setup

The Setup option forces users to enter a password in order to access the BIOS Setup Utility.

Always

The Always option forces users to enter a password in order to boot up the system.

4.8. Exit Options

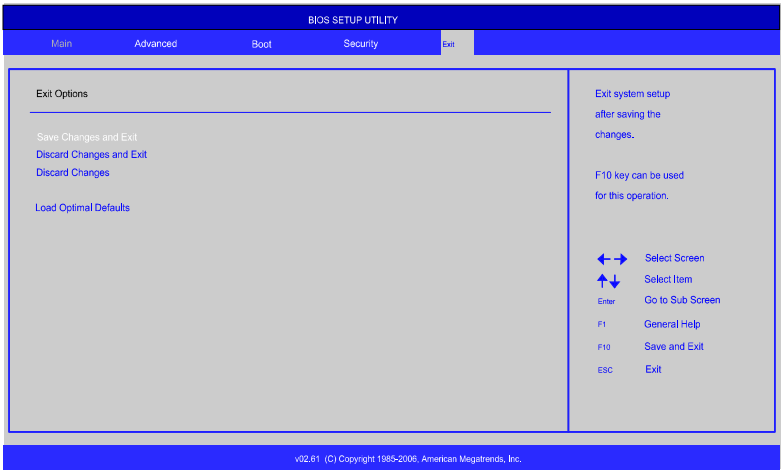


Figure 32: Illustration of Exit Options screen

4.8.1. Save Changes and Exit

Save all changes to the BIOS and exit the BIOS Setup Utility. The "F10" hotkey can also be used to trigger this command.

4.8.2. Discard Changes and Exit

Exit the BIOS Setup Utility without saving any changes. The "Esc" hotkey can also be used to trigger this command.

4.8.3. Discard Changes

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched. The "F7" hotkey can also be used to trigger this command.

4.8.4. Load Optimal Defaults

Load optimal default values for all the setup items. The default optimized values are defined by the mainboard manufacturer to provide optimized environment for a basic system. The "F9" hotkey can also be used to trigger this command.

5. Driver Installation

5.1. Microsoft Driver Support

The AMOS-3002 is compatible with Microsoft operating systems. The latest Windows drivers can be downloaded from the VEPD website at www.viaembedded.com.

For embedded operating systems, the related drivers can be found in the VIA Embedded website at www.viaembedded.com.

5.2. Linux Driver Support

The AMOS-3002 is compatible with many Linux distributions.

Support and drivers are provided through various methods including:

- Drivers provided by VIA
- Using a driver built into a distribution package
- Visiting www.viaembedded.com for the latest updated drivers
- Installing a third party driver (such as the ALSA driver from the Advanced Linux Sound Architecture project for integrated audio)
- Debian Linux 6 (Kernel 2.6.32-5-686)

For OEM clients and system integrators developing a product for long term production, other code and resources may also be made available. You can submit a request to your VEPD support contact.

6. Troubleshooting

For Windows7 or Windows Server 2008 R2 Service Pack 1 users only:
If encounter the issue such as the system reboots automatically instead of entering sleep mode. Install the hotfix released by Microsoft to address this issue. The hotfix is available at the following link:

http://support.microsoft.com/kb/2502664/en-us

VIA Embedded

Taiwan Headquarters
1F, 531 Zhong-Zheng Road
Xindian District, New Taipei City 231,
Taiwan

TEL: 886.2.2218.5452
FAX: 886.2.2218.5453
Email: embedded@via.com.tw

USA
940 Mission Court
Fremont, CA 94539
USA

TEL: 1.510.683.3300
FAX: 1.510.687.4654
Email: embedded@viatech.com

Europe
In den Dauen 6
53117 Bonn
Germany

TEL: 49.228.688565.0
FAX: 49.228.688565.19
Email: embedded@via-tech.de

China
Tsinghua Science Park Bldg. 7
No. 1 Zongguancun East Road
Haiden District, Beijing, 100084
China

TEL: 86.10.59852288
FAX: 86.10.59852299
Email: embedded@viatech.com.cn

Japan
3-15-7 Ebisu MT Bldg. 6F
Higashi, Shibuya-ku
Tokyo 150-0011
Japan

TEL: 81.3.5466.1637
FAX: 81.3.5466.1638
Email: embedded@viatech.co.jp

Korea
2F, Sangjin Bldg., 417
Dogok Dong, Gangnam-Gu
Seoul 135-854
South Korea

TEL: 82.2.571.2986
FAX: 82.2.571.2987
Email: embedded@via-korea.com