



MODEL:
IVS-100-BT

Advanced Auto Data Server with Intel® Atom™ E3826 CPU, 2.0 GB DDR3L Memory, 802.11b/g/n Wi-Fi, Two GbE LAN Ports, One HDMI Output, One VGA Output, Two SIM Card Slots, On-board GPS, One 2.5" SATA HDD/SSD Bay, RoHS Compliant

User Manual

Revision

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August 24, 2015	1.01	Updated description for IVS-UHF01-R10 on page 13
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This equipment has been tested and found to comply with 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 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 circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any change or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radiation Exposure Statement

This equipment complies With FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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Chapter

1

Introduction

1.1 Overview



Figure 1-1: IVS-100-BT Advanced Auto Data Server

The IVS-100-BT is an embedded system designed for in-car use. At the heart of the system is the Intel® Atom™ E3826 processor, offering low power in a powerful package. The IVS-100-BT is preinstalled with 2 GB DDR3L memory and a 32 GB 2.5" SATA SSD.

The system supports HDMI and VGA display outputs and 802.11b/g/n wireless networking capability. It also offers Global Position System (GPS), On-Board Diagnostic System (OBD) technology and 3G mobile telecommunications network connection (optional).

Other peripherals include four USB 3.0 ports, two GbE ports, one RS-422/485 and GPIO connector, two RS-232 COM ports, optional video capture port and audio line-in and line-out jacks.

1.2 Model Variations

The model variations of the IVS-100-BT are listed below.

Model	CPU	2 GB DDR3L Memory Preinstalled
IVS-100-BT-E3/2G-R10	1.46 GHz Intel® Atom™ E3826	Yes
IVS-100-BT- R10	1.46 GHz Intel® Atom™ E3826	No

Table 1-1: Model Variations

IVS-100-BT Advanced Auto Data Server

1.3 Features

All of the IVS-100-BT models feature the following:

- Advanced auto data server with 1.46 GHz Intel® Atom™ E3826 CPU
- 2 GB DDR3L memory preinstalled
- 32 GB 2.5" SATA SSD preinstalled
- Windows® Embedded Standard 7 OS preinstalled
- Built-in GPS
- Optional Wi-Fi, Bluetooth and 3G network
- Supports vehicle power
- Optional 4-channel software compression video capture card
- One SDHC card slot for data storage
- Two 10/100/1000 Mbps Ethernet ports
- VGA and HDMI output ports
- Two SIM card slots
- Two RS-232 COM ports
- One RS-422/485 and GPIO connector
- Four USB 3.0 ports
- Audio line-in and line-out
- Four RFID connectors for optional UHF RFID antenna
- Supports vehicle bus protocol (OBD-II/J1939/FMS)
- RoHS compliant

1.4 Front Panel

The following are found on the front panel.

- 1 x DC power input connector
- 2 x Gigabit Ethernet RJ-45 ports
- 1 x GPS antenna connector (COM3, COM5)
- 1 x HDMI connector
- 1 x 3G antenna connector (optional)
- 1 x Line-out jack
- 1 x Line-in jack
- 1 x OBD-II connector (COM4)

- 1 x Power button
- 2 x RS-232 COM ports (COM1, COM2) (DB-9)
- 1 x RS-422/485 (COM6) and GPIO connector
- 1 x VGA connector
- 1 x Video capture connector (optional)
- 2 x Wi-Fi and Bluetooth antenna connectors (optional)
- 4 x UHF RFID antenna connectors (optional)
- 4 x USB 3.0 ports

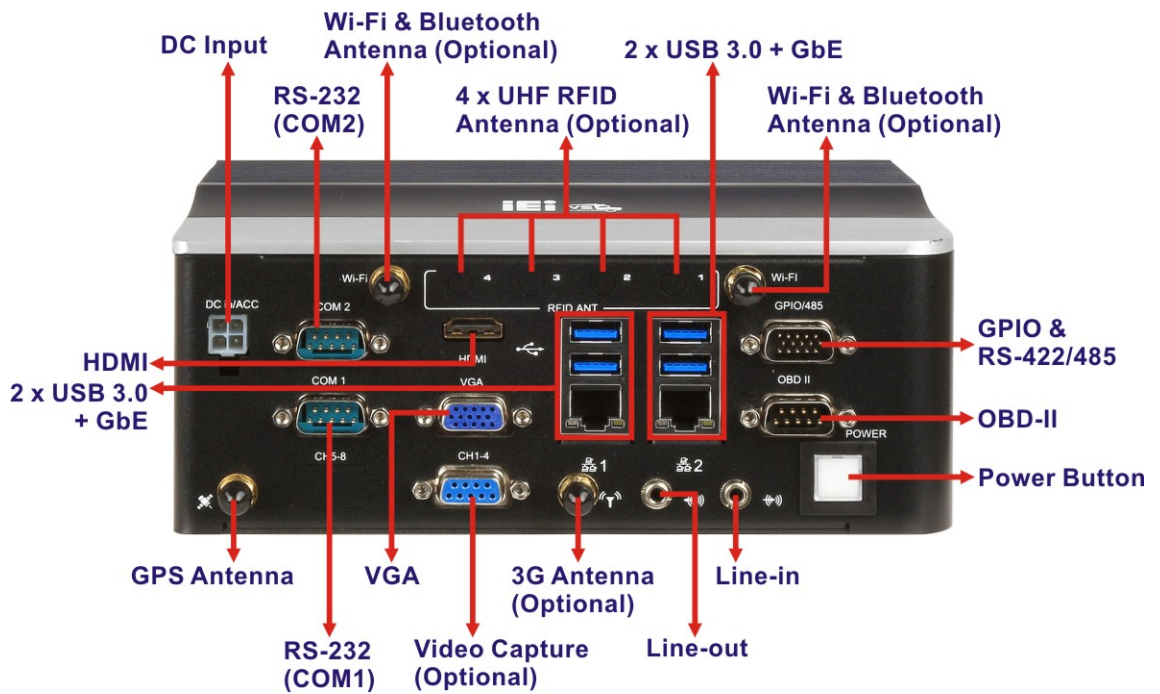


Figure 1-2: Front Panel

IVS-100-BT Advanced Auto Data Server

1.5 Side Panel

The left side panel has an SDHC card slot for SD storage card installation (Figure 1-3).

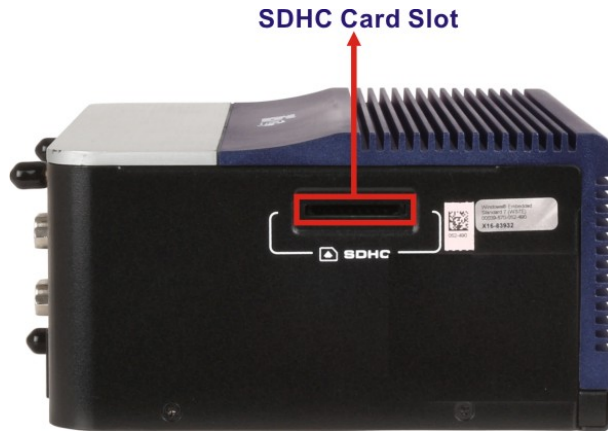


Figure 1-3: Side View

1.6 Bottom Panel

The bottom panel has VESA mounting screw holes for mounting.

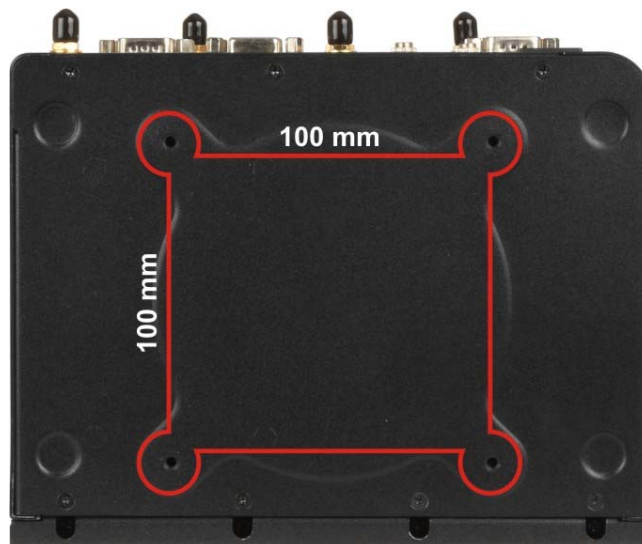


Figure 1-4: Bottom View

1.7 System Specifications

The IVS-100-BT technical specifications are listed in **Table 1-2**.

System	
CPU	1.46 GHz Intel® Atom™ E3826 (dual-core, 1MB cache, TDP=7W)
Memory	2 x 204-pin 1067 MHz DDR3L SO-DIMM slots (preinstalled with 2 GB memory for IVS-100-BT-E3/2G-R10)
OS	Preinstalled Windows® Embedded Standard 7 E
Storage	1 x 2.5" SATA 6Gb/s HDD/SSD bay (preinstalled 32 GB 2.5" SATA SSD) 1 x SDHC card slot (system max. 32 GB) 1 x mSATA slot (SATA 3Gb/s)
Communication	
Ethernet	2 x GbE RJ-45
Wireless LAN	PCIe Mini, 802.11b/g/n, 1T1R Wi-Fi module (optional)
Bluetooth	Bluetooth v2.0 (integrated with WWAN)
WWAN+Bluetooth	PCIe Mini, WCDMA/HSDPA/HSUPA+Bluetooth module (optional) 2 x SIM card slots (support Bluetooth voice)
GPS	On-board GPS module
Data Collection	
RFID	4 x UHF RFID connectors for optional UHF RFID antenna
Video Capture	Optional 4-channel software compression video capture card (max. 8 channels)
Connectors and Buttons	
Antenna Connectors	1 x GPS antenna connector 1 x WWAN antenna connector (optional) 4 x UHF RFID antenna connectors (optional) 2 x Wi-Fi and Bluetooth antenna connectors (optional)
I/O Ports	1 x 9 V ~ 30 V DC power input connector with ACC control 2 x Gigabit Ethernet RJ-45 ports 1 x HDMI connector 1 x Line-in jack 1 x Line-out jack 1 x OBD-II connector (COM4)

IVS-100-BT Advanced Auto Data Server

	<p>1 x Power button with LED</p> <p>2 x RS-232 COM port (COM1, COM2) (DB-9)</p> <p>1 x RS-422/485 (COM6) and GPIO connector (DB-15)</p> <p>1 x SDHC card slot</p> <p>1 x Video capture connector (optional)</p> <p>1 x VGA connector (resolution: up to 2560x1600@60Hz)</p> <p>4 x USB 3.0 ports</p>
Power	
Power Input	<p>9 V ~ 30 V DC input with ACC control</p> <p>Cigarette lighter power or ACC power</p>
Environmental and Physical Specifications	
Mounting	VESA 100 mm x 100 mm
Dimensions (WxDxH)	200.0 mm x 155.0 mm x 76.6 mm
Weight (Net/Gross)	2.1 kg/3.6 kg
Operating Temperature	-20°C ~ 60°C (with air flow)
Storage Temperature	-30°C ~ 70°C
Humidity	5% ~ 95% (non-condensing)
Operating Shock	Half-sine wave shock 5 G, 11 ms, 3 shocks per axis
Operating Vibration	MIL-STD-810F 514.5C-2 (with SSD)
Safety	CE, FCC, e-MARK

Table 1-2: Technical Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions



WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- **Wear an anti-static wristband:** Wearing an anti-static wristband can prevent electrostatic discharge.
- **Self-grounding:** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- **Use an anti-static pad:** When configuring any circuit board, place it on an anti-static mat.
- **Only handle the edges of the PCB:** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the IVS-100-BT is unpacked, please do the following:

- Follow the anti-static guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

IVS-100-BT Advanced Auto Data Server





2.3 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IVS-100-BT was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The IVS-100-BT is shipped with the following components:

Quantity	Item	Image
1	IVS-100-BT advanced auto data server	
1	ACC power cable (P/N: 32002-001900-100-RS)	
1	OBD-II cable (P/N: 32025-000300-100-RS)	
1	Video capture cable (P/N: 32007-001400-100-RS)	






Quantity	Item	Image
1	3G and GPS integration antenna (P/N: 32506-000100-100-RS)	
1	User manual CD and driver CD	

Table 2-1: Packing List

2.4 Optional Items

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

Item	Image
Cigarette lighter power cable (P/N: 32002-001800-100-RS)	
J1939/FMS cable (P/N: 32025-000400-100-RS)	
Power adapter with 4-pin transfer cable (P/N: IVIPOWER-4PIN-R10)	

IVS-100-BT Advanced Auto Data Server




Item	Image
UHF RFID patch antenna with cable, 915 MHz (P/N: AVL-2000PLUS-FCC01-R10)	
UHF RFID module without antenna, 915 MHz (P/N: IVS-UHF01-R10)	
OS image of Windows® Embedded Standard 7 E for IVS-100-BT (P/N: IVS-100-WES7E-R10)	
802.11/b/g/n, 1T1R, wireless kit (assemble-to-order) (P/N: IVS-WIFI-KIT01-R10)	
WWAN kit (assemble-to-order) (P/N: IVS-3G-KIT01-R10)	
4-channel video capture card, software compression, PCIe Mini interface (assemble-to-order) (P/N: IVS-SC01-R10)	
IVI dead reckoning box, USB output (P/N: IVI-DR-R10)	

Table 2-2: Optional Items

Chapter

3

Installation

3.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the maintenance of the IVS-100-BT may result in permanent damage to the IVS-100-BT and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IVS-100-BT. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IVS-100-BT 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 IVS-100-BT, place it on an anti-static pad. This reduces the possibility of ESD damaging the IVS-100-BT.
- **Only handle the edges of the PCB:** - When handling the PCB, hold the PCB by the edges.

3.2 Installation Precautions

When installing the IVS-100-BT, please follow the precautions listed below:

- **Power turned off:** When installing the IVS-100-BT, 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 IVS-100-BT, to configure the jumpers or plug in added peripheral devices, ground themselves first and wear an 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 SIM card and an SDHC card (optional)
- Step 3:** Mount the system
- Step 4:** Connect peripheral devices
- Step 5:** Power up the system

3.4 SDHC Card Installation

To install an SDHC card, follow the instructions below.

- Step 1:** Locate the SDHC card slot on the left side panel. See **Figure 1-3**.
- Step 2:** Insert an SDHC card into the slot (**Figure 3-1**).



Figure 3-1: SDHC Card Installation

IVS-100-BT Advanced Auto Data Server

3.5 SIM Card Installation



WARNING:

The IVS-100-BT is not compatible with a micro-SIM (3FF) adapter or a nano-SIM (4FF) adapter. Please install a mini-SIM (2FF or Standard SIM) card for proper network connection.

The IVS-100-BT has two SIM card sockets inside the chassis. To install a SIM card, follow the instructions below.



NOTE:

The IVS-100-BT provides an application for setting which SIM card to use. Refer to **Section 5.3.2** for details.

Step 1: Turn the IVS-100-BT over.

Step 2: Remove the bottom panel retention screws (**Figure 3-2**) and gently lift the bottom panel.

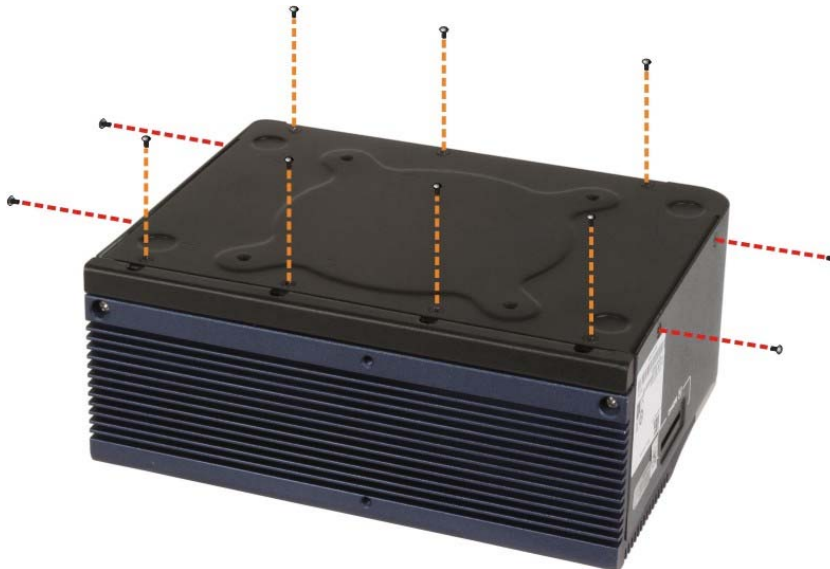


Figure 3-2: Bottom Panel Retention Screws

Step 3: Disconnect the SATA connector and the SATA power connector from the motherboard to entirely remove the bottom panel.

Step 4: The SIM card sockets are located under the 3G card (if installed). Remove the 3G card by removing the two 3G card retention screws (**Figure 3-3**).

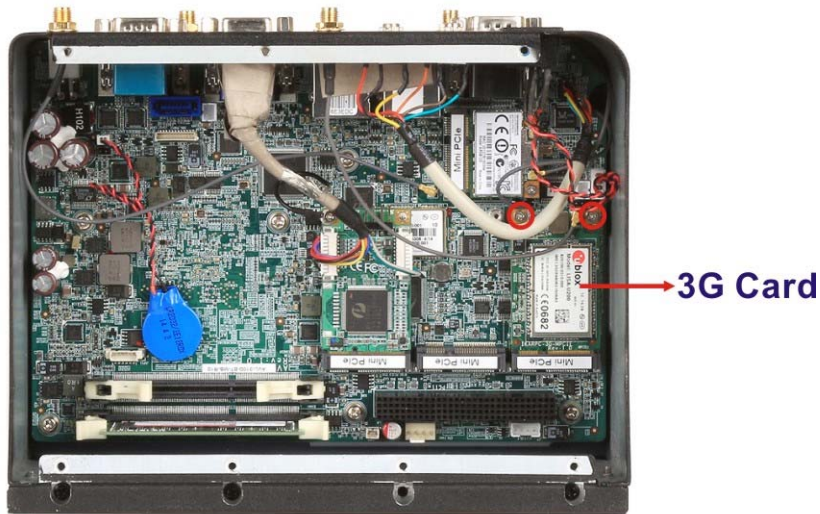


Figure 3-3: 3G Card Retention Screws

Step 5: There are two SIM card slots in the IVS-100-BT (**Figure 3-4**). Insert the SIM card into the slot as indicated in **Figure 3-4**.

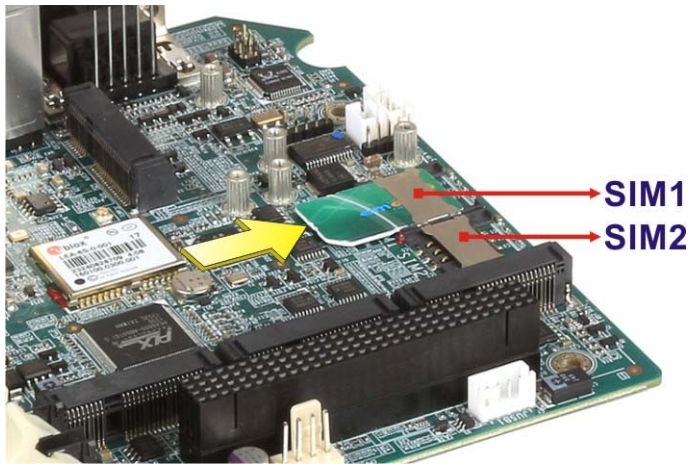


Figure 3-4: SIM Card Socket Locations

IVS-100-BT Advanced Auto Data Server

3.6 Mounting the System

The IVS-100-BT is VESA (Video Electronics Standards Association) compliant and can be mounted on a device with a 100 mm interface pad. The VESA mounting screw holes are located on the bottom panel as shown in **Figure 3-5**. Please follow the user manual came with the mounting device to mount the IVS-100-BT.

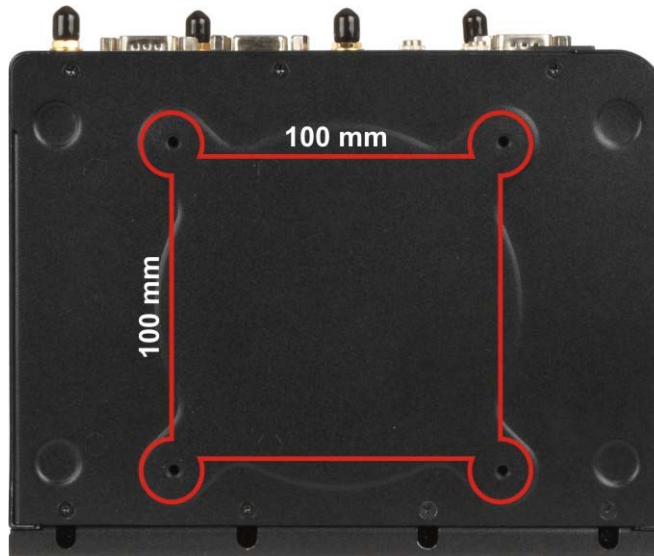


Figure 3-5: VESA Mounting Screw Holes



NOTE:

When purchasing the mounting device, please ensure that it is VESA compliant and that the device has a 100 mm interface pad. If the mounting device is not VESA compliant, it cannot be used to support the IVS-100-BT.

3.7 I/O Interface Connectors

This section provides an overview of the I/O interface connectors of the IVS-100-BT.



NOTE:

The following lists the device ports for the corresponding connectors.

- RS-422/485: COM6
- OBD-II/CAN: COM4
- GPS: COM3, COM5 for data
- 3G: USB port

3.7.1 Audio

The IVS-100-BT has two audio jacks – line-out jack and line-in jack. The audio jack locations are shown in **Figure 3-6**.

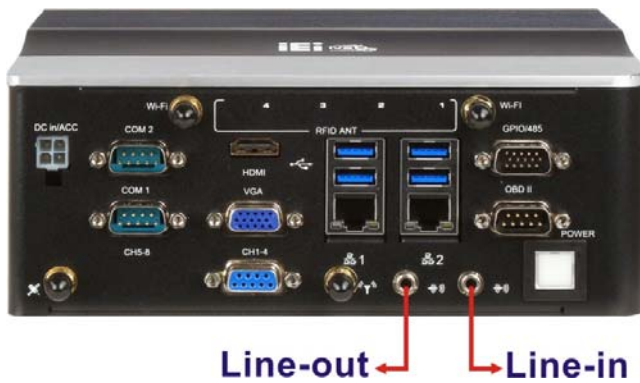


Figure 3-6: Audio Connectors

3.7.2 HDMI

The HDMI connector transmits a digital signal to compatible HDMI display devices such as a TV or computer screen. The pinouts for the HDMI connector are listed in **Table 3-1**.

Pin	Description	Pin	Description
1	HDMI_DATA2	2	GND
3	HDMI_DATA2#	4	HDMI_DATA1

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Pin	Description	Pin	Description
5	GND	6	HDMI_DATA1#
7	HDMI_DATA0	8	GND
9	HDMI_DATA0#	10	HDMI_CLK
11	GND	12	HDMI_CLK#
13	N/C	14	N/C
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+5
19	HDMI_HPD	20	HDMI_GND
21	HDMI_GND	22	HDMI_GND
23	HDMI_GND		

Table 3-1: HDMI Connector Pinouts

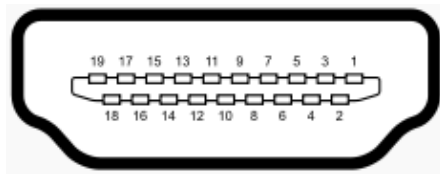


Figure 3-7: HDMI Connector Pinout Locations

3.7.3 LAN

The IVS-100-BT has two external RJ-45 LAN connectors. The RJ-45 connector enables connection to an external network. The pinouts for the LAN connector are listed in **Table 3-2**.

Pin	Description	Pin	Description
1	MD0+	2	MD0-
3	MD1+	4	MD1-
5	MD2+	6	MD2-
7	MD3+	8	MD3-

Table 3-2: LAN Connector Pinouts

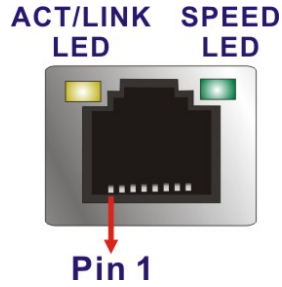


Figure 3-8: RJ-45 Ethernet Connector

3.7.4 OBD-II (COM4)

The IVS-100-BT has one DB-9 male connector for OBD-II connection. The pinouts for OBD-II connector are listed in **Table 3-3**.

Pin	Description
1	GND
2	GND
3	OBD-CAN_H
4	ISO-9141-2-K
5	OBD-CAN_L
6	J1850-
7	J1850+
8	ISO-9141-2-L
9	NC

Table 3-3: OBD-II Connector Pinouts

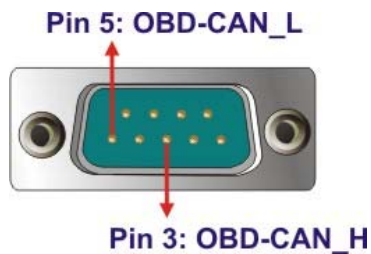


Figure 3-9: OBD-II Connector Pinout Locations

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To connect the OBD-II connector, use the OBD-II cable (**Figure 3-10**) in the package to connect the IVS-100-BT with the vehicle. The J1939/FMS cable can be purchased separately from IEI.

OBD-II Cable

J1939/FMS Cable (Optional)



Figure 3-10: OBD-II Cable and J1939/FMS Cable

The pinout locations of the OBD-II cable connector and the optional J1939/FMS cable connector are shown below.

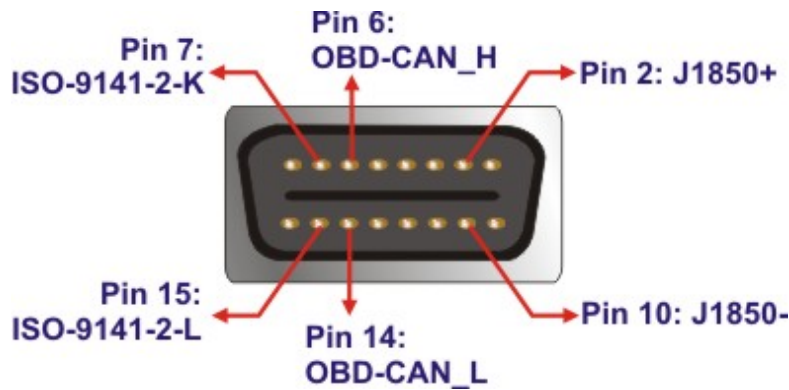


Figure 3-11: OBD-II Connector Pinouts

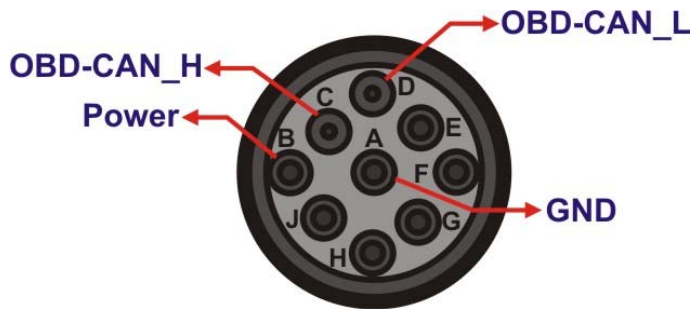


Figure 3-12: J1939/FMS Connector Pinouts

3.7.5 Power Input

The IVS-100-BT has one 9 V ~ 30 V DC input connector on the front panel. The pinouts for the power input connector are shown in **Figure 3-13**.

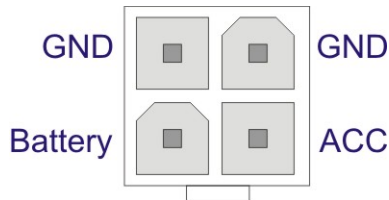


Figure 3-13: Power Input Connector

The IVS-100-BT can use either ACC power or DC power from the vehicle. To use ACC power, connect the IVS-100-BT to the vehicle through the ACC power cable. See **Figure 3-14**.

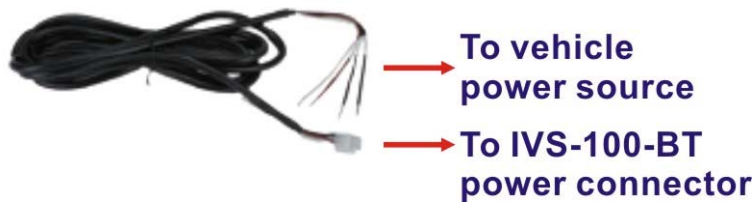


Figure 3-14: ACC Power Cable

To use DC power, connect the IVS-100-BT to the vehicle cigarette lighter connector through the optional cigarette lighter cable. See **Figure 3-15**.



Figure 3-15: Cigarette Lighter Cable (Optional)

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3.7.6 RS-232 COM Port (COM1, COM2)

The IVS-100-BT has two DB-9 RS-232 COM ports on the front panel for serial devices. The pinouts for the COM port connector are shown in **Table 3-4**.

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 3-4: RS-232 COM Port (COM1, COM2) Pinouts

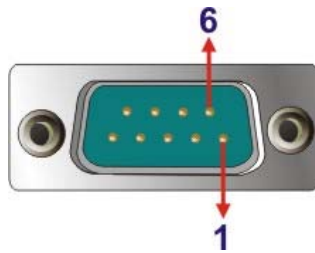


Figure 3-16: RS-232 COM Port (COM1, COM2) Pinout Locations

3.7.7 RS-422/485 (COM6) & GPIO

The IVS-100-BT has one male DB-15 connector on the front panel for connecting to RS-422/485 serial devices and digital I/O devices. The pinouts for the male DB-15 connector are listed in **Table 3-5**.

Pin	GPIO	RS-422	RS-485
1	D_IN0		
2	D_IN1		
3	D_IN2		
4	D_IN3		
5	+5V		
6	D_OUT0		
7	D_OUT1		
8	D_OUT2		

Pin	GPIO	RS-422	RS-485
9	D_OUT3		
10	GND	GND	GND
11		TXD-	Data-
12		TXD+	Data+
13		RXD-	
14		RXD+	
15	NC	NC	NC

Table 3-5: RS-422/485 & GPIO Connector Pinouts

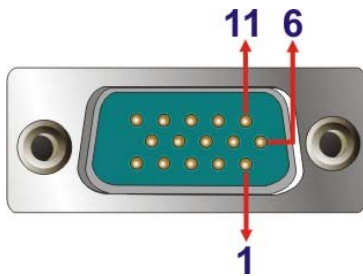


Figure 3-17: RS-422/485 & GPIO Connector Pinout Locations

3.7.8 USB 3.0

The IVS-100-BT has four external USB 3.0 connectors. The pinouts for the USB 3.0 connector are listed in **Table 3-6**.

Pin	Description	Pin	Description
1	VCC_USB	10	VCC_USB
2	Data0-	11	Data1-
3	Data0+	12	Data1+
4	GND	13	GND
5	USB3P0_RXDN1	14	USB3P0_RXDN2
6	USB3P0_RXDP1	15	USB3P0_RXDP2
7	GND	16	GND
8	USB3P0_TXDN1	17	USB3P0_TXDN2
9	USB3P0_TXDP1	18	USB3P0_TXDP2

Table 3-6: USB 3.0 Port Pinouts

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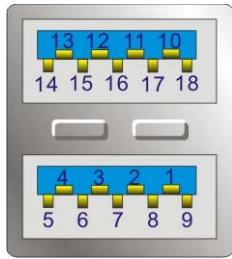


Figure 3-18: USB 3.0 Port Pinout Locations

3.7.9 Video Capture (Optional)

The IVS-100-BT has one DB-9 female connector for video capture connection. The pinouts for the video connector are listed in **Table 3-7**.

Pin	Description
1	CN1_A
2	CN1_B
3	CN1_C
4	CN1_D
5	SIN1_A
6	GND
7	GND
8	GND
9	GND

Table 3-7: Video Connector Pinouts

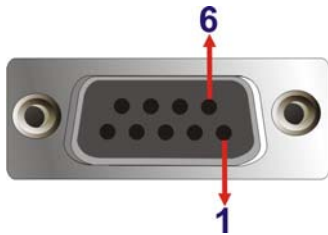


Figure 3-19: Video Connector Pinout Locations

To connect the video capture connector, use the video cable (**Figure 3-20**) in the package to connect the IVS-100-BT with devices.



Figure 3-20: Video Capture Cable

3.7.10 VGA

The IVS-100-BT has a female DB-15 VGA connector on the front panel. The VGA connector is connected to a CRT or VGA monitor. The pinouts for the VGA connector are listed in **Table 3-8**.

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-8: VGA Connector Pinouts

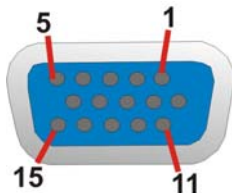


Figure 3-21: VGA Connector Pinout Locations

3.8 Power-On Procedure

3.8.1 Installation Checklist

**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.

To power on the IVS-100-BT, please make sure of the following:

- The SIM card is installed
- The bottom cover is installed
- All peripheral devices (antenna, serial communications devices etc.) are connected
- The system is securely mounted
- The power cables are plugged in

3.8.2 Power-on Procedure

To power-on the IVS-100-BT please follow the steps below:

Step 1: Connect either the ACC power cable or the optional cigarette lighter power cable from the IVS-100-BT to the vehicle.

Step 2: To turn on the system, long press the power button for **five seconds** until the power button lights up in blue. See **Figure 3-22**.

9 V ~ 30 V DC Input



Figure 3-22: Power Connector and Power Button

3.8.3 Power State

The following table shows the relation of the power state and vehicle ignition system. The auto start-up and shut-down time delay can be set by the IVS-100-BT BIOS options.

	LOCK	ACC	ON	START
ACC Signal	Off	On	On	Off
Car Cigarette Lighter	Off	On	On	Off
5 V Standby Power	Off	On after 1 second	On	On
Auto Start-up	--	After 10 seconds ~ 60 minutes (configured by BIOS option*)		--
Auto Shut-down	After 20 seconds ~ 18 hours (configured by BIOS option*)	--	--	--

*Please refer to **Section 4.3.4: Power Management BIOS Menu**

Table 3-9: Power State and Ignition System

Chapter

4

BIOS

4.1 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.

4.1.1 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.

4.1.2 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
-	Decrease the numeric value or make changes

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Key	Function
Page Up key	Move to the previous page
Page Dn key	Move to the next page
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	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 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** key.

4.1.4 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.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- 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.

4.2 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.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Main	Advanced	Chipset Security Boot Save & Exit
BIOS Information		Set the Date. Use Tab to switch between Date elements.
BIOS Vendor	American Megatrends	
Core Version	5.009	
Compliance	UEFI 2.3; PI 1.2	
Project Version	B313AT13.ROM	
Build Date and Time	05/20/2014 09:39:19	
CPU Configuration		
Microcode Patch	Not loaded	
BayTrail SoC	Unknown	
Memory Information		----- →←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Total Memory	2048 MB (LPDDR3)	
TXE Information		
Sec RC Version	00.05.00.00	
TXE FW Version	01.00.02.1060	
System Date	[Thu 04/23/2015]	
System Time	[16:10:27]	
Access Level	Administrator	
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

BIOS Menu 1: Main

The **Main** menu 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.

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4.3 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.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit

> ACPI Settings
> Super IO Configuration
> Hardware Monitor
> Power Management
> SMS/RTC Wake Settings
> Serial Port Console Redirection
> CPU Configuration
> IDE Configuration
> USB Configuration

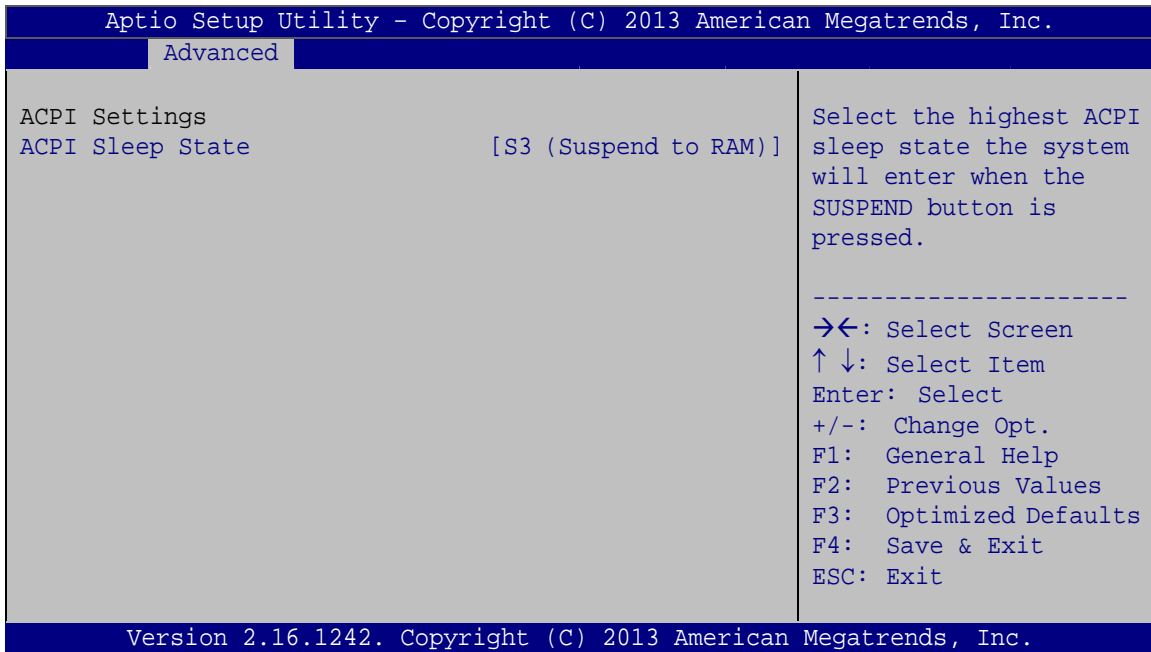
System ACPI Parameters.
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
    
```

BIOS Menu 2: Advanced

4.3.1 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 [S3 (Suspend to RAM)]

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

- **S3 (Suspend to RAM)** **DEFAULT** 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.

IVS-100-BT Advanced Auto Data Server

4.3.2 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced
-----
Super IO Configuration                               Set Parameters of Serial
                                                    Port 1 (COMA)
                                                    -----
Super IO Chip                                     F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 6 Configuration(RS422/RS485)
                                                    -----
                                                    →←: Select Screen
                                                    ↑ ↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

```

BIOS Menu 4: Super IO Configuration

4.3.2.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 5**) to configure the serial port n.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced
-----
Serial Port n Configuration                       Enable or Disable Serial
                                                    Port (COM)
                                                    -----
Serial Port                                     [Enabled]
Device Settings                               IO=3F8h; IRQ=4
Change Settings                               [Auto]
                                                    -----
                                                    →←: Select Screen
                                                    ↑ ↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

```

BIOS Menu 5: Serial Port n Configuration Menu

4.3.2.1.1 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,
5, 6, 7, 9,
10, 11, 12** Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- ➔ **IO=2F8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12** Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- ➔ **IO=3E8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12** Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- ➔ **IO=2E8h;
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12** Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

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4.3.2.1.2 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,
5, 6, 7, 9,
10, 11, 12 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- **IO=2F8h;**
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- **IO=3E8h;**
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- **IO=2E8h;**
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

4.3.2.1.3 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=2E0h;**
IRQ=10 Serial Port I/O port address is 2E0h and the interrupt address is IRQ10
- **IO=3F8h;**
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- **IO=2F8h;**
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- **IO=3E8h;**
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- **IO=2E8h;**
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12 Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

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- ➔ **IO=3E0h;** Serial Port I/O port address is 3E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12
- ➔ **IO=2E0h;** Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
IRQ=3, 4,
5, 6, 7, 9,
10, 11, 12

4.3.3 Hardware Monitor

The **Hardware Monitor** menu (**BIOS Menu 6**) displays the CPU and system temperatures.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
Advanced
PC Health Status
CPU Temperature           : +55 C
System Temperature       : +53 C
+SOC_VCC                  : +0.896 V
+V5S                      : +5.107 V
+12S                      : +12.729 V
+1.5S                    : +1.531 V
VCC3V                    : +3.312 V
VSB3V                    : +3.344 V
VSB5V                    : +5.064 V
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

```

BIOS Menu 6: Hardware Monitor

➔ PC Health Status

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

- CPU Temperature
- System Temperature
- Voltages:

- +SOC_VCC
- +V5S
- +12S
- +1.5S
- VCC3V
- VSB3V
- VSB5V

4.3.4 Power Management

Use the **Power Management** menu (**BIOS Menu 7**) to configure the power management function.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced
Current Voltage           : +12.5 V
Auto Power Off Voltage   [9V]
Set Auto Power Off
Voltage 8V~37V
*** Delay Time Setting ***
Auto Power On Delay      [10 sec]
Auto Power Off Delay     [20 sec]
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
  
```

BIOS Menu 7: Power Management

➔ Auto Power Off Voltage [9V]

Use the **Auto Power Off Voltage** option to set the automatic power-off voltage from 8V to 37V. If the system voltage is lower than the value set here, the system will be powered off automatically.

➔ Auto Power On Delay [10 sec]

Use the **Auto Power On Delay** option to set the automatic power-on delay time. Configuration options are listed below.

IVS-100-BT Advanced Auto Data Server

- 10 sec **DEFAULT**
- 30 sec
- 1 min
- 5 min
- 10 min
- 15 min
- 30 min
- 1 hour

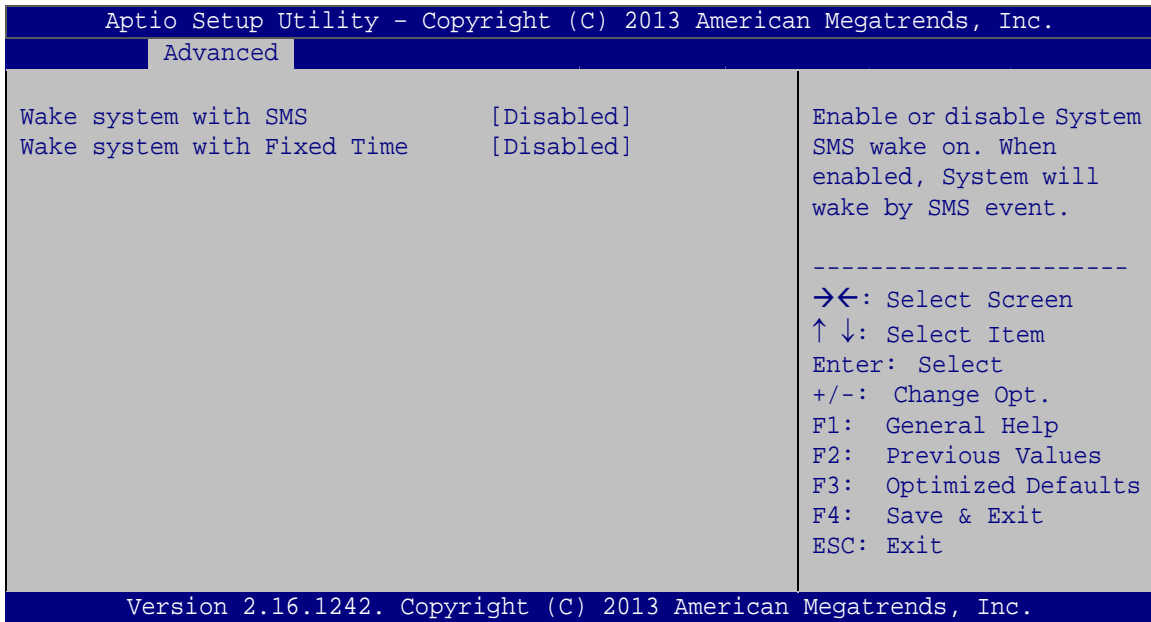
→ Auto Power Off Delay [20 sec]

Use the **Auto Power Off Delay** option to set the automatic power-off delay time. Configuration options are listed below.

- 20 sec **DEFAULT**
- 1 min
- 5 min
- 10 min
- 30 min
- 1 hour
- 6 hour
- 18 hour

4.3.5 SMS/RTC Wake Settings

The **SMS/RTC Wake Settings** menu (**BIOS Menu 8**) enables the system to wake at the specified time.



BIOS Menu 8: SMS/RTC Wake Settings

→ Wake system with SMS [Disabled]

Use the **Wake system with SMS** option to enable or disable the system wake on SMS event.

- **Disabled** **DEFAULT** The SMS cannot generate a wake event
- **Enabled** The SMS can generate a wake event

→ Wake system with Fixed Time [Disabled]

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

- **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event
- **Enabled** If selected, the **Wake up every day** option appears

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allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear 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.

4.3.6 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 9**) 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.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced
-----
COM1
  Console Redirection          [Disabled]
> Console Redirection Settings
  Console Redirection          [Disabled]
> Console Redirection Settings

COM2
  Console Redirection          [Disabled]
> Console Redirection Settings

-----
-><: Select Screen
↑ ↓: Select Item
Enter: Select
+/-: Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit

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```

BIOS Menu 9: 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

The following options are available in the **Console Redirection Settings** submenu when the **Console Redirection** option is enabled.

→ 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 serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

- **9600** Sets the serial port transmission speed at 9600.
- **19200** Sets the serial port transmission speed at 19200.
- **38400** Sets the serial port transmission speed at 38400.
- **57600** Sets the serial port transmission speed at 57600.
- **115200** **DEFAULT** Sets the serial port transmission speed at 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.

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→ 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.

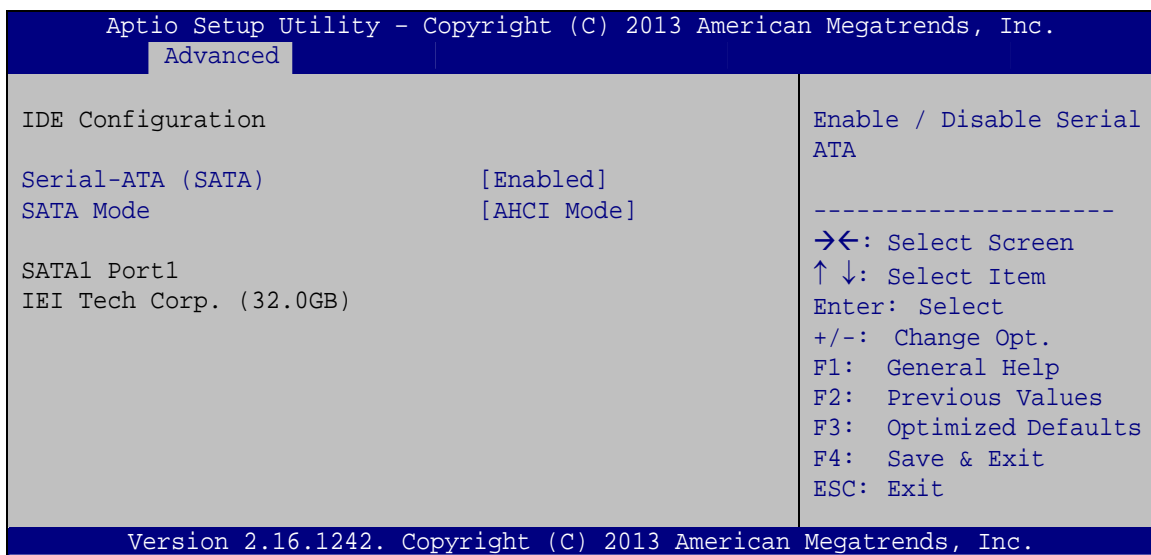
- | | | | |
|---|----------|----------------|------------------------------------|
| → | 1 | DEFAULT | Sets the number of stop bits at 1. |
| → | 2 | | Sets the number of stop bits at 2. |

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- ➔ **Disabled** Disables Enhanced Intel SpeedStep® Technology.
- ➔ **Enabled** **DEFAULT** Enables Enhanced Intel SpeedStep® Technology.

4.3.8 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 11**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 11: IDE Configuration

➔ Serial-ATA (SATA) [Enabled]

Use the **Serial-ATA (SATA)** option to configure the SATA controller.

- ➔ **Enabled** **DEFAULT** Enables the on-board SATA controller.
- ➔ **Disabled** Disables the on-board SATA controller.

➔ SATA Mode [AHCI Mode]

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

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

4.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced
-----
USB Configuration
USB Devices:
  1 Keyboard, 2 Hubs
Legacy USB Support                [Enabled]
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
-----
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
  
```

BIOS Menu 12: USB Configuration

➔ **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.

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- ➔ **Enabled** **DEFAULT** Legacy USB support enabled
- ➔ **Disabled** Legacy USB support disabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 13**) to access the PCH-IO and System Agent (SA) Subsystem 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) 2013 American Megatrends, Inc.
Main   Advanced  Chipset  Security  Boot   Save & Exit
-----
> North Bridge
> South Bridge

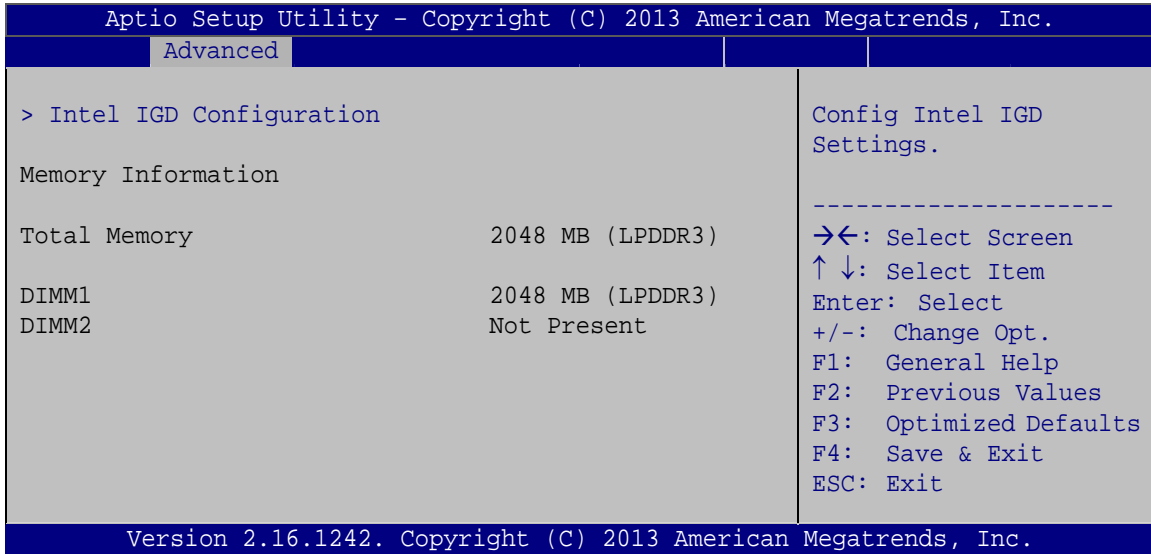
North Bridge Parameters
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
  
```

BIOS Menu 13: Chipset

4.4.1 North Bridge

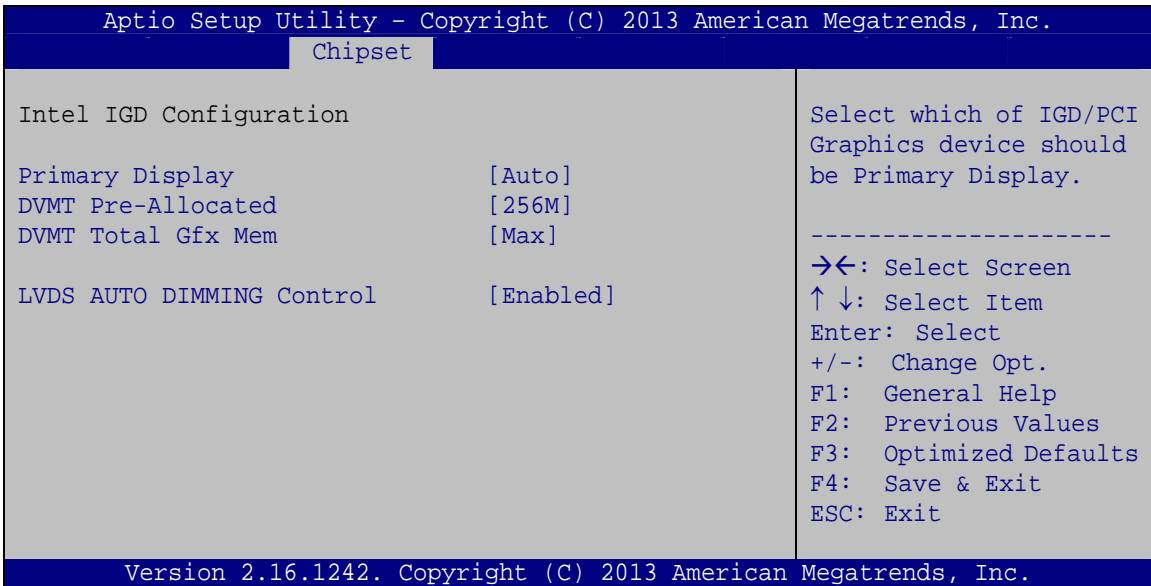
Use the **North Bridge** menu (**BIOS Menu 14**) to configure the north bridge parameters and view the memory information.



BIOS Menu 14: North Bridge

4.4.1.1 Intel IGD Configuration

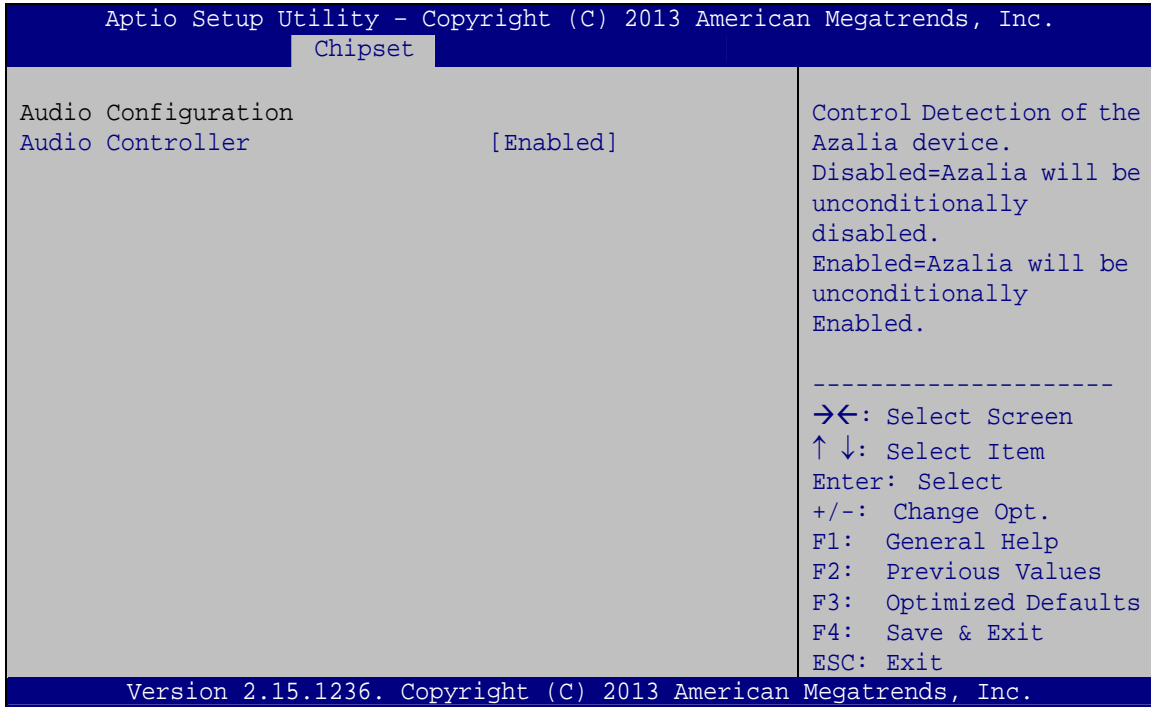
Use the **Intel IGD Configuration** submenu (**BIOS Menu 15**) to configure the graphics settings.



BIOS Menu 15: Intel IGD Configuration

4.4.2 South Bridge

Use the **South Bridge** menu (**BIOS Menu 16**) to configure the PCH chipset.



BIOS Menu 16: South Bridge

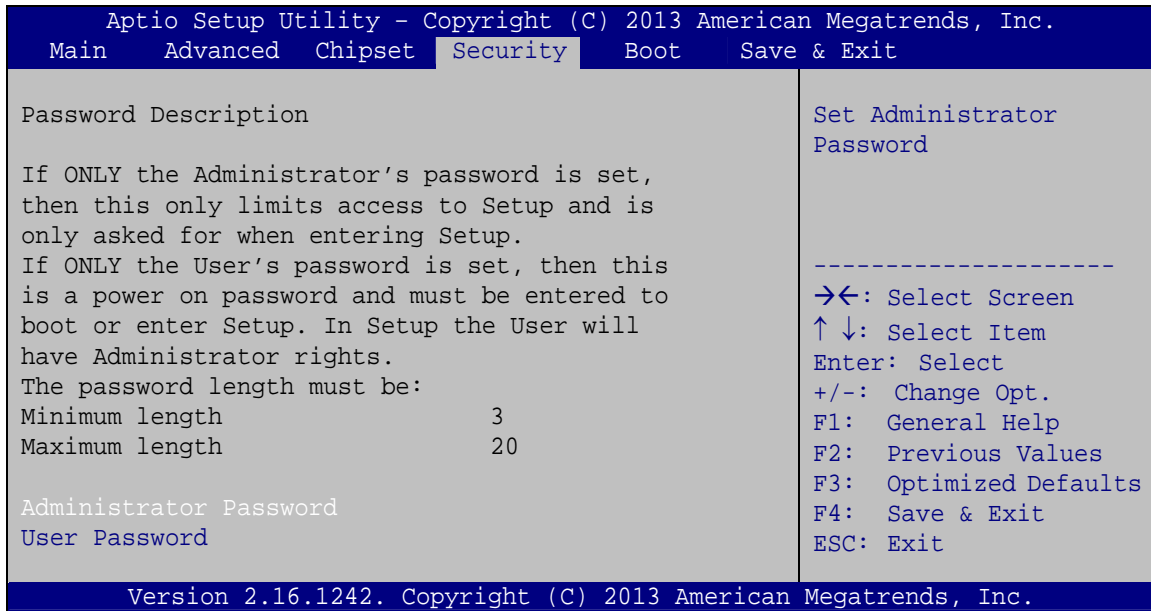
→ Audio Controller [Enabled]

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

- **Disabled** The onboard High Definition Audio controller is disabled
- **Enabled** **DEFAULT** The onboard High Definition Audio controller is detected automatically and enabled

4.5 Security

Use the **Security** menu (**BIOS Menu 17**) to set system and user passwords.



BIOS Menu 17: Security

→ Administrator Password

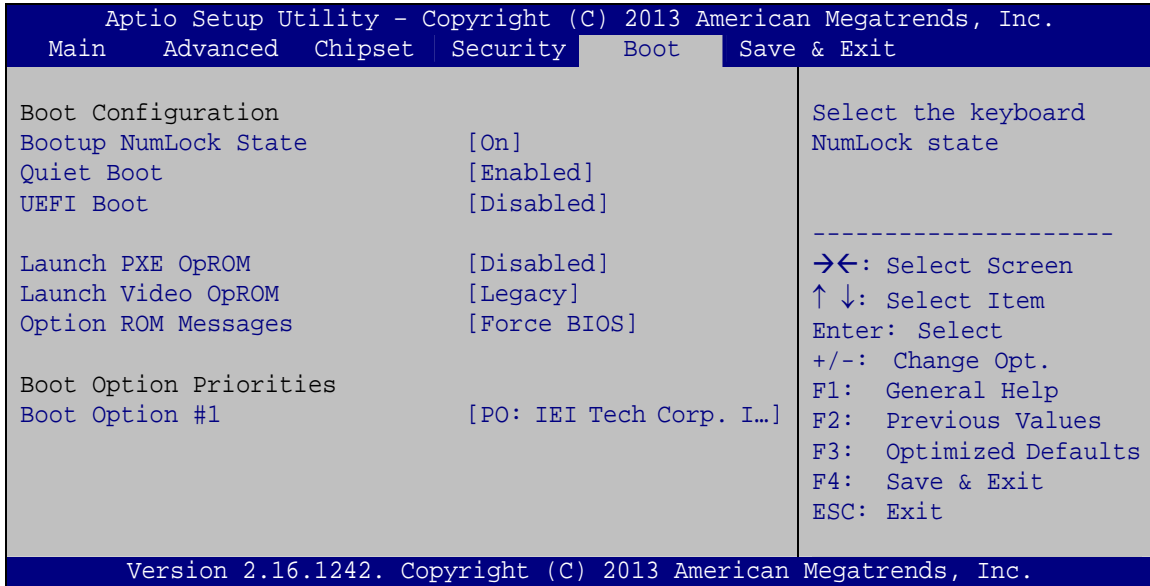
Use the **Administrator Password** to set or change a administrator password.

→ User Password

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

4.6 Boot

Use the **Boot menu (BIOS Menu 18)** to configure system boot options.



BIOS Menu 18: 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.

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→ 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

→ UEFI Boot [Disabled]

Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

- **Enabled** Enables to boot from the UEFI devices.
- **Disabled** **DEFAULT** Disables to boot from the UEFI devices.

→ Launch PXE OpROM [Disabled]

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

- **Disabled** **DEFAULT** Ignore all PXE Option ROMs
- **Enabled** Load PXE Option ROMs.

→ Launch Video OpROM [Legacy]

Use the **Launch Video OpROM** option to control the execution of UEFI and Legacy Video OpROM.

- **Do not launch** Ignore all Legacy Video Option ROMs
- **UEFI** Load the execution of UEFI.
- **Legacy** **DEFAULT** Load Legacy Video Option ROMs.

→ 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.

4.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 19**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
Main   Advanced  Chipset  Security  Boot   Save & Exit
-----
Save Changes and Reset
Discard Changes and Reset

Restore Defaults
Save as User Defaults
Restore User Defaults

Reset the system after
saving the changes.

-----
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
    
```

BIOS Menu 19: Exit

→ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

→ **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.

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→ 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.

Chapter

5

Drivers and Utilities

IVS-100-BT Advanced Auto Data Server

5.1 Utility CD Auto Run

**NOTE:**

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

All the drivers and utilities for the IVS-100-BT are included in the CD that came with the system. To install the drivers or utilities, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

**NOTE:**

If the system does not initiate the "autorun" program when the CD is inserted, click the Start button, select Run, then type X:\autorun.exe (where X:\ is the system CD drive) to access the IEI Driver CD main menu.

Step 2: The driver main menu appears (**Figure 5-1**).



Figure 5-1: Utility CD Menu

Step 3: Click an option from the menu to install the drivers or utilities.

5.2 Drivers

The utility CD contains drivers for Windows® 7 and Windows® 8 operating systems. Please select the corresponding drivers for the system.

The following drivers can be installed on the **Windows® 7** operating system:

- Chipset
- Graphics
- Audio
- LAN
- WLAN
 - iKarPC-3G-mPCIe: for installing Bluetooth driver, ublox LISA-200 3.75G module driver and IEI Mobile AP application tool
 - ublox_LISA-U200: 3.75G module driver
 - VIA_VN9485: wireless LAN module driver
- Video capture
- Bluetooth

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- Others:
 - TXE
 - USB 3.0
 - I/O driver

The following drivers can be installed on the **Windows 8** operating system:

- Chipset
- Graphics
- Audio
- LAN
- WLAN
 - iKarPC-3G-mPCIe: for installing Bluetooth driver, ublox LISA-200 3.75G module driver and IEI Mobile AP application tool
 - ublox_LISA-U200: 3.75G module driver
 - VIA_VN9485: wireless LAN module driver
- Others:
 - I/O driver

5.3 Mobile AP

IEI provides an application tool, Mobile AP, for the users of the IVS-100-BT with 3.75G module installed to manage mobile network and make a phone call.

5.3.1 Installation

To install this application tool, please locate the following folder in the utility CD:
x:\IVS-100-BT-R10 V1.0\CD_Boot\AutoPlay\Docs\5.WLAN\iKarPC-3G-mPCIe. This folder contains two files for different operating systems.

- **IEI_Mobile_AP_Setup_x86_v1.0.exe** for 32-bit Windows OS
- **IEI_Mobile_AP_Setup_x64_v1.0.exe** for 64-bit Windows OS

Double click the .exe file that is corresponding to the OS version, then the system starts to extract the file. After extracting, it starts to install Bluetooth driver followed by the installation of ublox LISA-200 3.75G module driver, and IEI Mobile AP application tool.

It is recommended to follow the step-by-step procedure to install all of these three drivers/applications.

5.3.2 Usage

To launch the application tool, double click the **MobileAP** icon on the Windows desktop. The user interface appears as shown in **Figure 5-2**. The functions are described below.

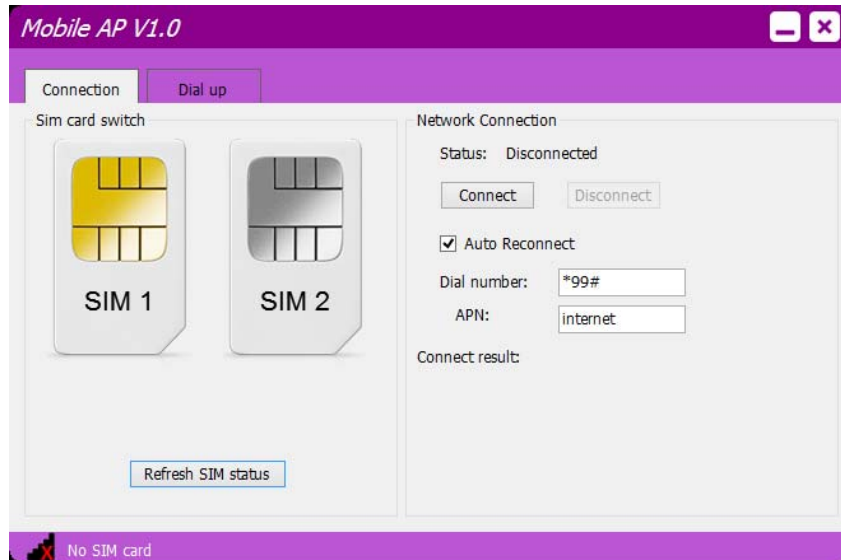


Figure 5-2: Mobile AP – Connection

- **Sim card switch:**
 - Tap a SIM card to designate a SIM card to use or tap the **Refresh SIM status** button to let the system detect automatically.
- **Network Connection:**
 - **Status:** shows the connection status. Tap the **Connect** button to connect the selected SIM card to network.
 - **Auto Reconnect:** allows the system to reconnect automatically.
 - **Dial number:** provided by the ISP for mobile network. The default value is ***99#**.
 - **APN (Access Point Name):** provided by the ISP for mobile network. The default value is **internet**.
 - **Connect result:** displays the connection result.

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The Mobile AP also allows the user to make a phone call. To use Mobile AP to make a phone call, tap the **Dial up** tab in the Mobile AP. Then, the user interface appears as shown in **Figure 5-3**. The functions are described below.

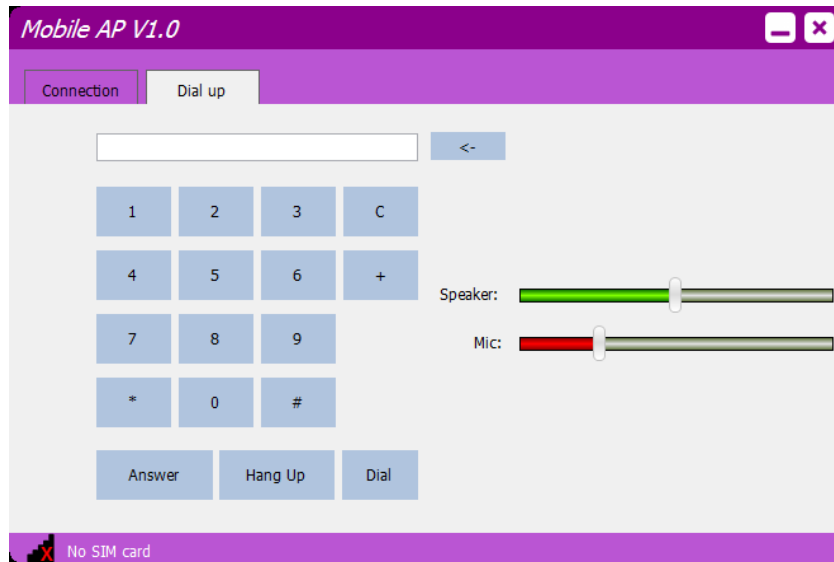


Figure 5-3: Mobile AP – Dial Up

- **<-:**
Tap to delete the previously entered number.
- **Dial:**
Tap to place a phone call after entering the phone number.
- **Hang Up:**
Tap to end a phone call.
- **Answer:**
Tap to answer a phone call.
- **Speaker:**
Drag to adjust the volume of the Bluetooth headset paired with the IVS-100-BT.
- **Mic:**
Drag to adjust the microphone volume of the Bluetooth headset paired with the IVS-100-BT.

Chapter

6

Maintenance

**WARNING:**

Take anti-static precautions whenever maintenance is being carried out on the system components. Failure to take anti-static precautions can cause permanent system damage. For more details on anti-static precautions, please refer to **Section 3.1**

6.1 System Maintenance Overview

**NOTE:**

When doing maintenance operations on the system, please follow the instructions in this chapter. Failure to follow these instructions may lead to personal injury and system damage.

To preserve the working integrity of the IVS-100-BT, the system must be properly maintained. If internal components need replacement, the proper maintenance procedures must be followed to ensure the system can continue to operate normally.

6.2 Component Replacement Procedure

**WARNING!**

Users are not advised to attempt to repair or replace any internal or external components of the IVS-100-BT embedded system other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the IVS-100-BT from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@ieiworld.com.

The system components listed below can all be replaced if they fail:

- SO-DIMM module
- Hard disk drive

6.2.1 SO-DIMM Replacement



WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the IVS-100-BT. Please make sure the purchased SO-DIMM complies with the memory specifications of the IVS-100-BT.

To replace a SO-DIMM memory module into a SO-DIMM socket, please follow the steps below.

Step 1: Remove the bottom panel retention screws (**Figure 6-1**) and lift the bottom panel.

Step 2: Disconnect the SATA connector and the SATA power connector from the motherboard to entirely remove the bottom panel.

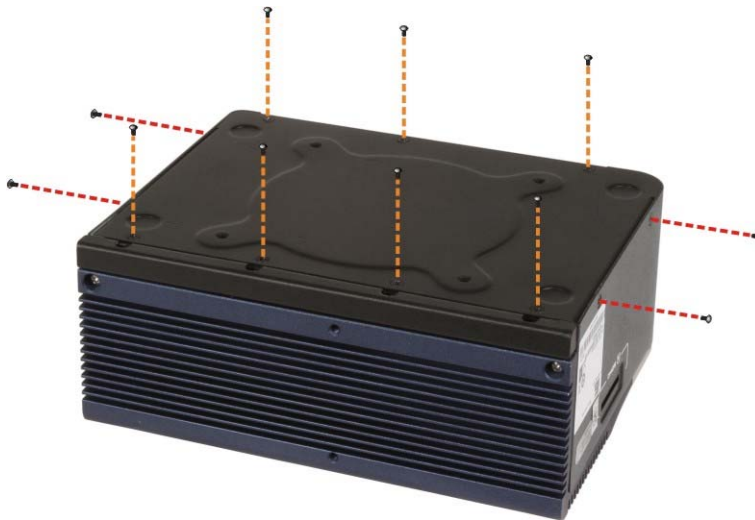
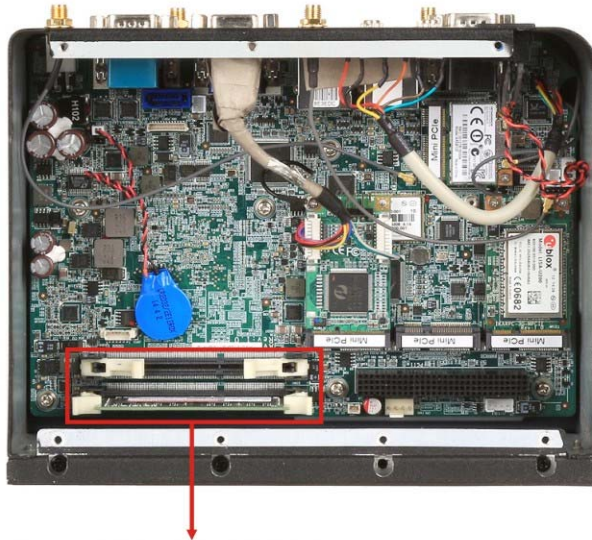


Figure 6-1: Bottom Panel Retention Screws

Step 3: Locate the SO-DIMM inside the bottom panel (**Figure 6-2**).

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**Two DDR3L SO-DIMM Slots
(One pre-installed with 2 GB DDR3L Memory)**

Figure 6-2: SO-DIMM Location

- Step 4:** Push two handles outward. The memory module is ejected by a mechanism in the socket. Remove the SO-DIMM.
- Step 5:** Align a new SO-DIMM so the notch on the memory lines up with the notch on the memory slot (**Figure 6-3**).
- Step 6:** Once aligned, press down until the SO-DIMM is properly seated. Clip the two handles into place (**Figure 6-3**).

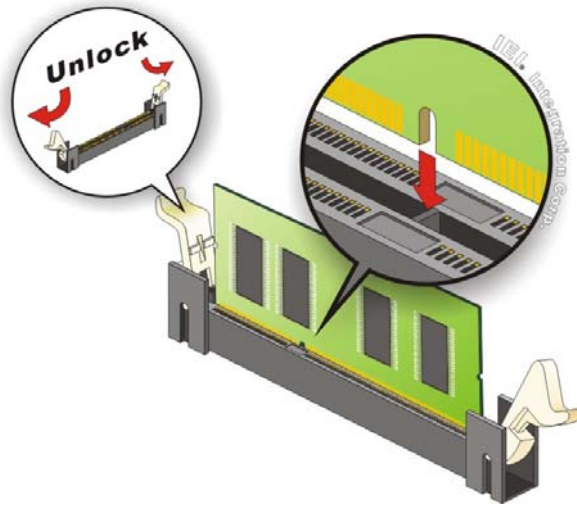


Figure 6-3: SO-DIMM Installation

6.2.2 HDD Replacement

The IVS-100-BT is preinstalled with a 32 GB 2.5" SATA SSD. If the HDD is failed, it must be replaced. To replace the HDD, please follow the steps below.

Step 1: Remove the bottom panel retention screws (Figure 6-4) and lift the bottom panel.

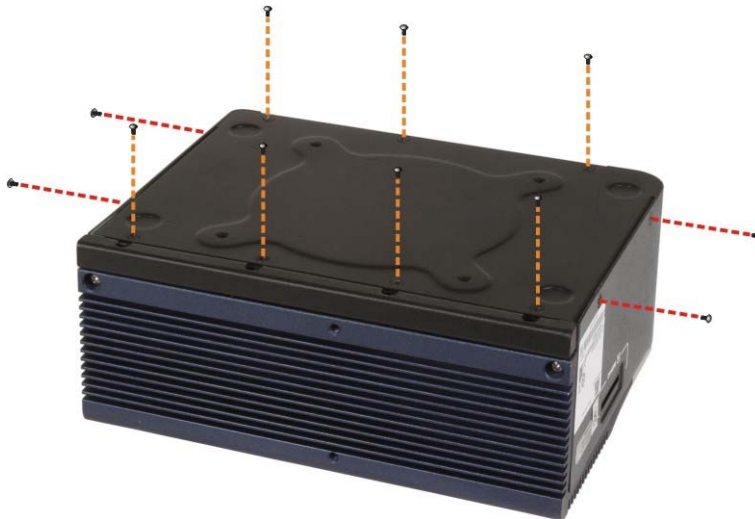


Figure 6-4: Bottom Panel Retention Screws

Step 2: The HDD is preinstalled inside the bottom surface. Locate the HDD.

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- Step 3:** Disconnect the SATA connector and the SATA power connector from the motherboard to entirely remove the bottom panel.
- Step 4:** Remove the four HDD bracket retention screws (**Figure 6-5**) to remove the HDD bracket and the HDD.

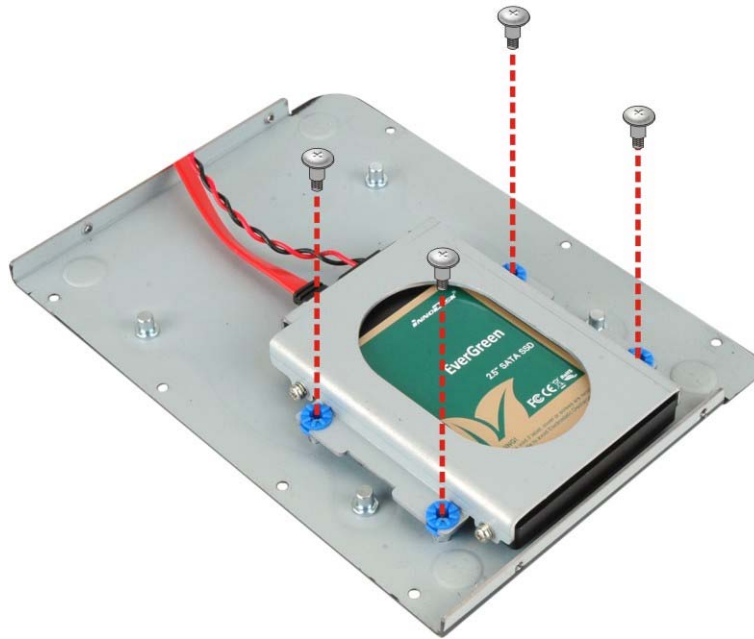


Figure 6-5: HDD Bracket Retention Screw Removal

- Step 5:** Remove the four HDD retention screws. Slide the old HDD to remove the HDD from the bracket. See **Figure 6-6**.



Figure 6-6: HDD Retention Screw Removal

- Step 6:** Slide a new HDD into the HDD bracket and connect the HDD with the SATA cable on the bracket.
- Step 7:** Secure the HDD to the bracket with the four previously removed retention screws.
- Step 8:** Secure the HDD bracket to the bottom surface using the four previously removed retention screws.
- Step 9:** Connect the SATA connector and the SATA power connector to the motherboard.
- Step 10:** Reinstall the bottom panel.

Chapter

7

Interface Connectors

7.1 Peripheral Interface Connectors

The IVS-100-BT motherboard comes with a number of peripheral interface connectors. The connector locations are shown in **Figure 7-1** and **Figure 7-2**. The Pin 1 locations of the on-board connectors are also indicated in the diagrams. The connector pinouts for these connectors are listed in the following sections.

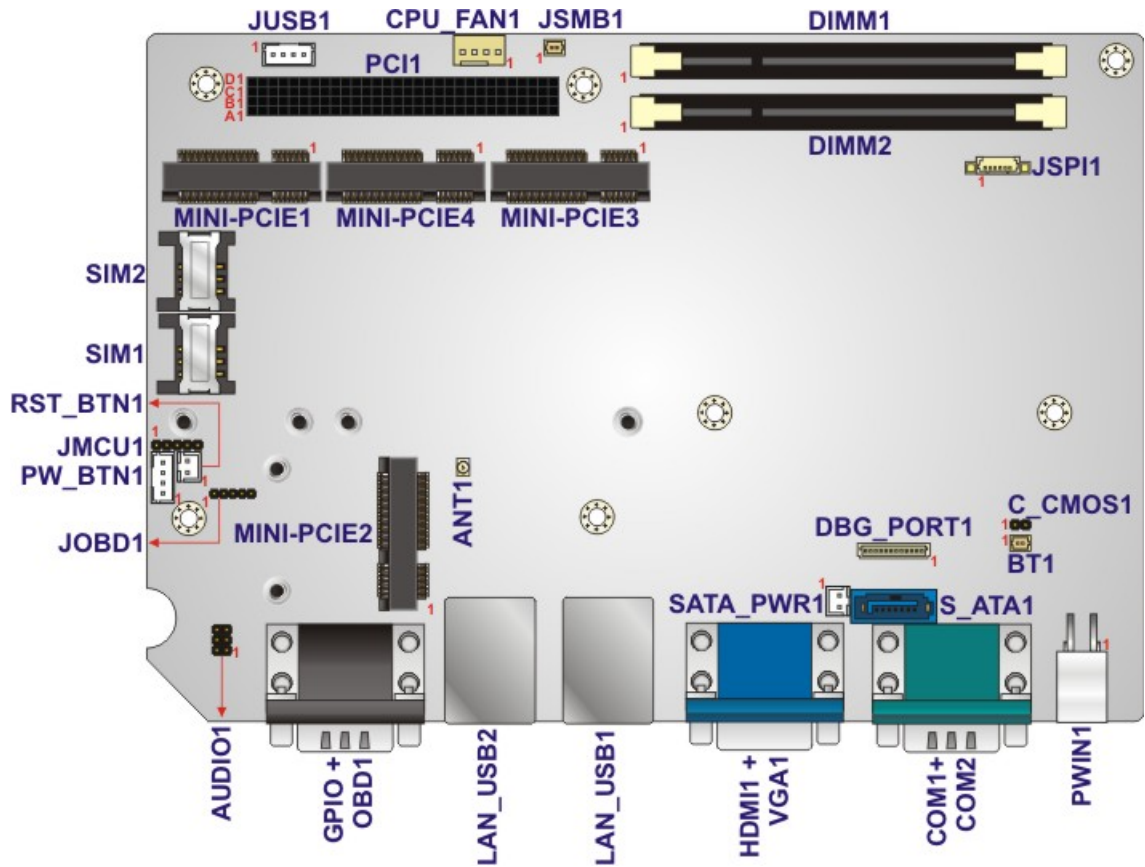


Figure 7-1: Main Board Layout Diagram (Front Side)

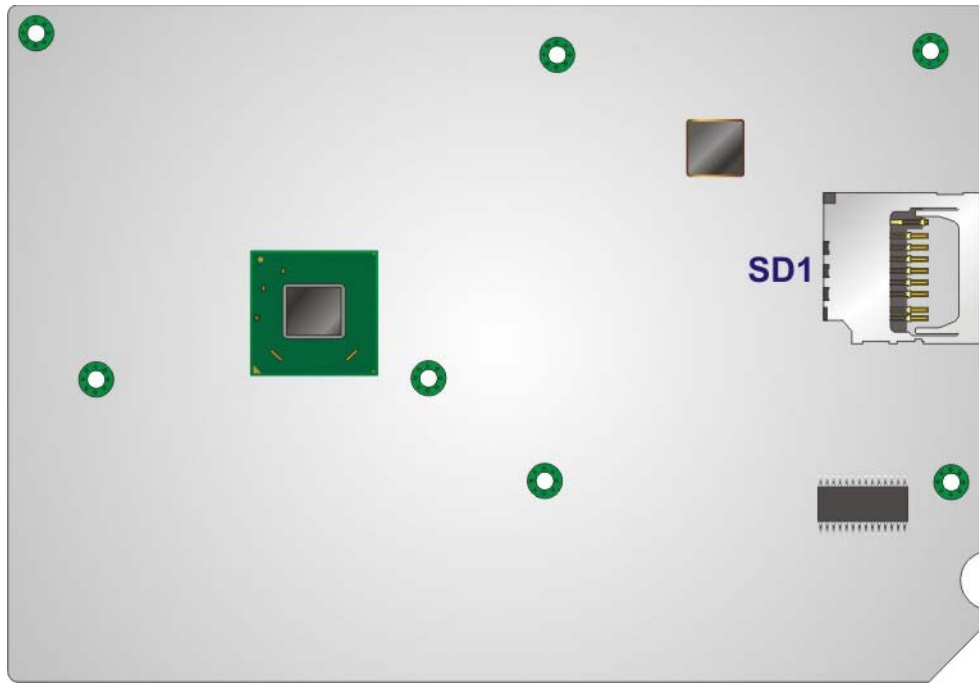


Figure 7-2: Main Board Layout Diagram (Solder Side)

7.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. The table below shows a list of the peripheral interface connectors on the IVS-100-BT motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
5 V SATA power connector	2-pin wafer	SATA_PWR1
Audio connector	6-pin header	AUDIO1
Battery connector	2-pin wafer	BT1
GPS antenna connector	Antenna connector	ANT1
LPC debug card connector	12-pin wafer	DBG_PORT1
Memory slots	204-pin DDR3L SO-DIMM	DIMM1, DIMM2
PCI-104 slot	PCI-104 slot	PCI1

Connector	Type	Label
PCIe Mini card slots (full-size)	52-pin full-size PCIe Mini slot	MINI-PCIE1, MINI-PCIE3, MINI-PCIE4
PCIe Mini card slot (half-size)	52-pin half-size PCIe Mini slot	MINI-PCIE2
Power button and LED connector	4-pin wafer	PW_BTN1
Programmer connectors	5-pin header	JOB1, JMCU1
Reset button	2-pin wafer	RST_BTN1
Serial ATA (SATA) drive connector	7-pin SATA	S_ATA1
SD card slot	SD card slot	SD1
SIM card slots	SIM card slot	SIM1, SIM2
SPI flash connector	6-pin wafer	JSPI1
USB 2.0 connector (for RFID)	4-pin wafer	JUSB1

Table 7-1: Peripheral Interface Connectors

7.2.1 5 V SATA Power Connector (SATA_PWR1)

PIN NO.	DESCRIPTION
1	VCC5
2	GND

Table 7-2: 5 V SATA Power Connector Pinouts

7.2.2 Audio Connector (AUDIO1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINEOUT_R	2	MIC_R
3	GND	4	GND
5	LINEOUT_L	6	MIC_L

Table 7-3: Audio Connector (AUDIO1) Pinouts

7.2.3 Battery Connector (BT1)

PIN NO.	DESCRIPTION
1	VBATT
2	GND

Table 7-4: Battery Connector (BT1) Pinouts

7.2.4 LPC Debug Card Connector (DBG_PORT1)

PIN NO.	DESCRIPTION
1	GND
2	CLK33M
3	RESET
4	FRAME
5	LAD0
6	LAD1
7	LAD2
8	LAD3
9	SERIRQ
10	GND
11	VCC3
12	N/A

Table 7-5: LPC Debug Card Connector (DBG_PORT1) Pinouts

7.2.5 PCIe Mini Card Slot for 3G Card (MINI_PCIE1)

The MINI_PCIE1 slot is 3G card/USB only interface and with voice function.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	VCC3
3	NC	4	GND
5	NC	6	VCC1.5
7	NC	8	SIM_VCC
9	GND	10	SIM_CIO
11	NC	12	SIM_CLK
13	NC	14	SIM_RST
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	NC	24	VCC3
25	NC	26	GND
27	GND	28	VCC1.5
29	GND	30	NC
31	NC	32	SMS_RING
33	NC	34	GND
35	GND	36	USB_DATA_N
37	GND	38	USB_DATA_P
39	VCC3	40	GND
41	VCC3	42	NC
43	NC	44	NC
45	NC	46	NC
47	NC	48	VCC1.5
49	NC	50	GND
51	NC	52	VCC3

Table 7-6: PCIe Mini Card Slot (MINI_PCIE1) Pinouts

7.2.6 PCIe Mini Card Slot for Wi-Fi Card (MINI_PCIE2)

The MINI_PCIE2 slot is a USB + PCIe interface.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	WAKE#	2	VCC3
3	NC	4	GND
5	NC	6	VCC1.5
7	NC	8	NC
9	GND	10	NC
11	CLK_PCIE_CLK_N	12	NC
13	CLK_PCIE_CLK_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	GPIO_WIFI
21	GND	22	PCIRST#
23	PCIE_RXN	24	VCC3
25	PCIE_RXP	26	GND
27	GND	28	VCC1.5
29	GND	30	SMB_CLK
31	PCIE_TXN	32	SMB_DATA
33	PCIE_TXP	34	GND
35	GND	36	USB_DATA_N
37	NC	38	USB_DATA_P
39	NC	40	GND
41	NC	42	NC
43	NC	44	NC
45	NC	46	NC
47	NC	48	VCC1.5
49	NC	50	GND
51	NC	52	VCC3

Table 7-7: PCIe Mini Card Slot (MINI_PCIE2) Pinouts

7.2.7 PCIe Mini Card Slot for Capture Card (MINI_PCIE3)

The MINI_PCIE3 slot is a USB + PCIe interface.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	WAKE#	2	VCC3
3	NC	4	GND
5	NC	6	VCC1.5
7	NC	8	NC
9	GND	10	NC
11	CLK_PCIE_CLK_N	12	NC
13	CLK_PCIE_CLK_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	DISABLE
21	GND	22	PCIRST#
23	PCIE_RXN	24	VCC3
25	PCIE_RXP	26	GND
27	GND	28	VCC1.5
29	GND	30	SMB_CLK
31	PCIE_TXN	32	SMB_DATA
33	PCIE_TXP	34	GND
35	GND	36	USB_DATA_N
37	NC	38	USB_DATA_P
39	NC	40	GND
41	NC	42	NC
43	NC	44	NC
45	NC	46	NC
47	NC	48	VCC1.5
49	NC	50	GND
51	NC	52	VCC3

Table 7-8: PCIe Mini Card Slot (MINI_PCIE3) Pinouts

7.2.8 PCIe Mini Card Slot for Capture Card or 3G Card (MINI_PCIE4)

The MINI_PCIE4 slot is a USB + PCIe interface.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	WAKE#	2	VCC3
3	NC	4	GND
5	NC	6	VCC1.5
7	NC	8	SIM_VCC
9	GND	10	SIM_CIO
11	CLK_PCIE_CLK_N	12	SIM_CLK
13	CLK_PCIE_CLK_P	14	SIM_RST
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	PCIE_RXN	24	VCC3
25	PCIE_RXP	26	GND
27	GND	28	VCC1.5
29	GND	30	NC
31	PCIE_TXN	32	NC
33	PCIE_TXP	34	GND
35	GND	36	NC
37	NC	38	NC
39	VCC3	40	GND
41	VCC3	42	NC
43	NC	44	NC
45	NC	46	NC
47	NC	48	VCC1.5
49	NC	50	GND
51	NC	52	VCC3

Table 7-9: PCIe Mini Card Slot (MINI_PCIE4) Pinouts

7.2.9 Power Button and LED Connector (PWR_BTN1)

PIN NO.	DESCRIPTION
1	PWRBTIN
2	GND
3	PWR_LED
4	GND

Table 7-10: Power Button and LED Connector (PWR_BTN1) Pinouts

7.2.10 Programmer Connectors (JOB1, JMCU1)

PIN NO.	DESCRIPTION
1	MCLR
2	VCC5
3	GND
4	ICSP_CLK
5	ICSP_DAT

Table 7-11: Programmer Connectors (JOB1, MCU1) Pinouts

7.2.11 Reset Button Connector (RST_BTN1)

PIN NO.	DESCRIPTION
1	SYSRST
2	GND

Table 7-12: Reset Button Connector (RST_BTN1) Pinouts

7.2.12 SATA Drive Connector (S_ATA1)

PIN NO.	DESCRIPTION
1	GND
2	SATA_TXP
3	SATA_TXN
4	GND
5	SATA_RXN
6	SATA_RXP
7	GND

Table 7-13: SATA Drive Connector (S_ATA1) Pinouts

7.2.13 SPI Flash Connector (JSPI1)

PIN NO.	DESCRIPTION
1	VCC3
2	CS
3	MISO
4	CLK
5	MOSI
6	GND

Table 7-14: SPI Flash Connector (JSPI1) Pinouts

7.2.14 USB 2.0 Connector (JUSB1)

PIN NO.	DESCRIPTION
1	VCC5
2	DATA-
3	DATA+
4	GND

Table 7-15: USB 2.0 Connector (JUSB1) Pinouts

7.3 External Interface Panel Connectors

The table below lists the rear panel connectors on the IVS-100-BT motherboard. Pinouts for these connectors can be found in **Section 3.7: I/O Interface Connectors**.

Connector	Type	Label
Ethernet and USB 3.0 connectors	RJ-45, USB 3.0	LAN_USB1, LAN_USB2
HDMI connector	HDMI	HDMI1
OBD-II connector	DB-9 male	OBD1
Power input connector	4-pin Molex	PWIN1
RS-422/485 & GPIO connector	15-pin male	GPIO
SD card slot (solder side)	SD card slot	SD1
Serial port connectors	DB-9 male	COM1, COM2
VGA connector	15-pin female	VGA1

Table 7-16: Rear Panel Connectors

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY



This equipment is in conformity with the following EU directives:

- EMC Directive 2004/108/EC
- Low-Voltage Directive 2006/95/EC
- RoHS II Directive 2011/65/EU
- Ecodesign Directive 2009/125/EC

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 R&TTE Directive 1999/5/EC.

English

IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Български [Bulgarian]

IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложими правила на Директива 1999/5/EC.

Česky [Czech]

IEI Integration Corp tímto prohlašuje, že tento zařizení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.

Dansk [Danish]

IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

Deutsch [German]

IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.

Eesti [Estonian]

IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

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Español [Spanish]

IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

Ελληνική [Greek]

IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.

Français [French]

IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Italiano [Italian]

IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Latviski [Latvian]

IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 1999/5/EK.

Lietuvių [Lithuanian]

IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 1999/5/EB 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 1999/5/EG.

Malti [Maltese]

IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.

Magyar [Hungarian]

IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

Polski [Polish]

IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.

Português [Portuguese]

IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

Româna [Romanian]

IEI Integration Corp declară că acest echipament este în conformitate cu cerințele esențiale și cu celelalte prevederi relevante ale Directivei 1999/5/CE.

Slovensko [Slovenian]

IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.

Slovensky [Slovak]

IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.

Suomi [Finnish]

IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 1999/5/EY 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 1999/5/EG.

Appendix

B

Safety Precautions

**WARNING:**

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the IVS-100-BT.

**WARNING:**

This is Class A Product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

B.1 Safety Precautions

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.

- ***Follow the electrostatic precautions*** outlined below whenever the IVS-100-BT is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the IVS-100-BT is being installed, moved or modified.
- ***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 the IVS-100-BT chassis is opened when the IVS-100-BT is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the IVS-100-BT.
- ***If considerable amounts of dust, water, or fluids enter the IVS-100-BT,*** turn off the power supply immediately, unplug the power cord, and contact the IVS-100-BT vendor.

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- **DO NOT:**
 - Drop the IVS-100-BT against a hard surface.
 - Strike or exert excessive force onto the LCD panel.
 - Touch any of the LCD panels with a sharp object
 - 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 IVS-100-BT may result in permanent damage to the IVS-100-BT and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IVS-100-BT. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IVS-100-BT 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 anti-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.

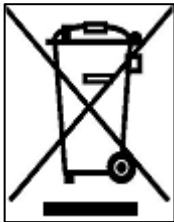
B.1.3 Product Disposal

**CAUTION:**

Risk of explosion if battery is replaced by an 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:



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 display products, 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 IVS-100-BT, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the IVS-100-BT, please read the details below.

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- Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.
- The interior of the IVS-100-BT does not require cleaning. Keep fluids away from the IVS-100-BT interior.
- Be cautious of all small removable components when vacuuming the IVS-100-BT.
- Turn the IVS-100-BT off before cleaning the IVS-100-BT.
- Never drop any objects or liquids through the openings of the IVS-100-BT.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the IVS-100-BT.
- Avoid eating, drinking and smoking within vicinity of the IVS-100-BT.

B.2.2 Cleaning Tools

Some components in the IVS-100-BT 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 IVS-100-BT.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the IVS-100-BT.
- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the IVS-100-BT.
- **Using solvents** – The use of solvents is not recommended when cleaning the IVS-100-BT 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 IVS-100-BT. Dust and dirt can restrict the airflow in the IVS-100-BT 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

OBD-II Reader Command

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C.1 Select a Chip Initial Mode: UpDate F/W or RUN F/W

- AP sends query
- F/W receives query

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Enter Boot Mode	0x3																		
Enter RUN Mode	0x3																		
Mode	1																		
Mode	0																		

C.2 Boot Mode

- Launch AP: P1618QP (Pic18F Bootloader)
- Baud Rate:115200

C.3 Run Mode

Any mode in Run mode

- AP sends query
- F/W receives query

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Enter OBD-II	\$	M	A	0x0	0x0														
Enter CAN Standard V2.2.B	\$	M	B	0x0	0x0														
Request mode & version	\$	M	R	0x0	0x0														
				A	D														

F/W returns (after receiving query)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Select a mode to send	\$	M	0	0x0 0	Ver (1) 0x1 0	Ver (2) 0x0 6	0x0 A	0x0 D											
Tele mode response	\$	M	1	0x0 0	Ver (1) 0x1 0	Ver (2) 0x0 6	0x0 A	0x0 D											
CAN S mode response	\$	M	2	0x0 0	Ver (1) 0x1 0	Ver (2) 0x0 6	0x0 A	0x0 D											
Enter Tele mode to respond	\$	M	T	0x0 A	0x0 D														
Enter CAN S mode to respond	\$	M	C	0x0 A	0x0 D														

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C.4 Into CAN_Standard V2.2.B (CAN standard)

- AP sends query
- F/W receives query

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Sent by CAN	\$	C	T	0x0A	0x0D														
Set CAN baud	\$	C	B	xxx Baud	0x00 Reserved	0x0 A	0x0 D												
Set to send by CAN	\$	C	X	0x00 Reserved	TxIDE RTR B0 B1 DLC	ID(1)	ID(2)	ID(3)	ID(4)	D1	D2	D3	D4	D5	D6	D7	D8	0x0 A	0x0 D
Setup menu	\$	C	M	M1ID(1)	M1ID(2)	M1I D(3)	M1I D(4)	M1 F(1) D(1)	M1F 1ID(2)	M1 F(1) D(3)	M1F 1ID(4)	M1 F(2) D(1)	M1F 2ID(2)	M1F 2ID(3)	M1 F(2) D(4)	M2I D(1)	M2I D(2)	M2I D(3)	M2I D(4)
	M2 F(1) D(1)	M2F 1ID(2)	M2 F(1) D(3)	M2F1ID(4)	M2F2ID(1)	M2F 2ID(2)	M2F 2ID(3)	M2 F(2) D(4)	M3F 3ID(1)	M3 F(3) D(2)	M3F 3ID(3)	M3 F(3) D(4)	M3F 4ID(1)	M3F 4ID(2)	M3 F(4) D(3)	M3F 4ID(4)	Rxl DE xxx xxx x	0x0 A	0x0 D
Read setting	\$	C	R	0x0A	0x0D														
Setup read menu	\$	C	G	0x0A	0x0D														

- F/W returns (after receiving query)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Set CAN baud complete	\$	C	9	0x0A	0x0 D														
CAN query setup	\$	C	3	0x0A	0x0 D														

complete																			
Menu setup	\$	C	4	0x0A	0x0														
complete					D														
Read query	\$	C	5	xxx	TxID	ID(1)	ID(2)	ID(3)	ID(4)	D1	D2	D3	D4	D5	D6	D7	D8	0x0A	0x0
setup				Bau	E														D
				d	RTR														
					B0														
					B1														
					DLC														
Read menu	\$	C	7	M1I	M1I	M1I	M1I	M1F	M1F	M1F	M1F	M1F	M1F	M1F	M1F	M2I	M2I	M2I	M2I
setup				D(1)	D(2)	D(3)	D(4)	1ID(1)	1ID(2)	1ID(3)	1ID(4)	2ID(1)	2ID(2)	2ID(3)	2ID(4)	D(1)	D(2)	D(3)	D(4)
	M2F	M2F	M2F	M2F	M2F	M2F	M2F	M2F	M3F	M3F	M3F	M3F	M3F	M3F	M3F	M3F	RxID	0x0A	0x0
	1ID(1)	1ID(2)	1ID(3)	1ID(4)	2ID(1)	2ID(2)	2ID(3)	2ID(4)	3ID(1)	3ID(2)	3ID(3)	3ID(4)	4ID(1)	4ID(2)	4ID(3)	4ID(4)	E		D
																	xxx		
																	xxxx		
Read CAN	\$	C	6	xxx	IDE	ID(1)	ID(2)	ID(3)	ID(4)	D1	D2	D3	D4	D5	D6	D7	D8	0x0A	0x0
complete				Bau	RTR														D
				d	B0														
					B1														
					DLC														
CAN starts	\$	C	8	0x0A	0x0														
query					D														
CAN query	\$	C	E	0x0A	0x0														
error					D														
CAN query	\$	C	F	0x0A	0x0														
succeed					D														

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C.5 Into Telematics (Vehicle Information)

- F/W:Telematics
- AP: Telematics V1.005

- AP sends query
- F/W receives query

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Scan all	Z	0	0x0 D																	
Scan all	Z	0x0 D																		
Scan OBD-II	Z	1	0x0 D																	
Scan J1939	Z	2	0x0 D																	
Scan FMS	Z	1	0x0 D																	
OBD-II input PID-1	A	Mo de- 1	Mo de- 2	PI D-1	PI D-2	0x0 D														
OBD-II input PID-2	B	Mo de- 1	Mo de- 2	PI D-1	PI D-2	0x0 D														
OBD-II input PID-3	C	Mo de- 1	Mo de- 2	PI D-1	PI D-2	0x0 D														
OBD-II input PID-4	D	Mo de- 1	Mo de- 2	PI D-1	PI D-2	0x0 D														
Reserved	E																			
Reserved	F																			
Reserved	G																			

Reserved	H																		
J1939 input	I	P	P	P	P	0x0													
PSPF		-1	-2	-1	-2	D													
FMS input	J	P	P	P	P	0x0													
PSPF		-1	-2	-1	-2	D													
Version	Y	0x0																	
		D																	

▪ F/W returns (after receiving query)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
No device is scanned																				
Devices Scanned																				

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OBD packet format (ASCII code)

OBD packet has five different format, they are:

1. CAN 11bits 250
2. CAN 29bits 250
3. CAN 11bits 500
4. CAN 29bits 500
5. Scanning

Each format has its input code, they are:

CAN 11bits 250: **A**

CAN 29bits 250: **B**

CAN 11bits 500: **C**

CAN 29bits 500: **D**

Scanning: **Z**

Example 1: To get PID=0104 from CAN 29bits 500 format

Input: **D0104+CR** (Use **ASCII code** as the input format of the firmware)

Output: **CAN 29bits 500, 0104, 18DAF111 08 0241040000000000+LF+CR**

(Use **ASCII code** as the input format of the firmware)

■ ID number **■** Key-in value **■** ID **■** Len **■** Data

Other Information: Data include eight different bytes

Byte 1: Data include some return information. For example,

1. 18DAF110 08 **06**4100BE1B301300

Byte1 is 06 followed by six non-zero values.

2. 18DAF110 08 **03**41043200000000

Byte1 is 03 followed by three non-zero values.

Byte 2: Mode is related with the Key-in value. For example:

0104 18DAF110 08 03**41**043200000000

Key-in value is 01, Byte 2 value will change to 41. The main difference is: 0 means to send out by query side, 4 means to send out by receiver side

Byte 3: PID is the same with the Key-in value. For example:

0104 18DAF110 08 0341**04**3200000000

Key-in value is 04, Byte 3 value will be 04.

Byte 4 define as A. (same with the PID code table on Wikipedia)

Byte 5 define as B. (same with the PID code table on Wikipedia)

Byte 6 define as C. (same with the PID code table on Wikipedia)

Byte 7 define as D. (same with the PID code table on Wikipedia)

As shown below:

01	24	4	O2S1_WR_lambda(1): Equivalence Ratio Voltage	0 0	2 8	N/A V	$((A*256)+B)/32768$ $((C*256)+D)/8192$
01	25	4	O2S2_WR_lambda(1): Equivalence Ratio Voltage	0 0	2 8	N/A V	$((A*256)+B)/32768$ $((C*256)+D)/8192$

Example 2: To Scan

Input: **Z+CR** (Use **ASCII code** as the input format of the firmware)

Output: CAN 11bits 250,1 NO SUPPORT+LF+CR

CAN 29bits 250,2 NO SUPPORT+LF+CR

CAN 11bits 500,3 NO SUPPORT+LF+CR

CAN 29bits 500,4 SUPPORT+LF+CR

(Use **ASCII code** as the input format of the firmware)

Appendix

D

Watchdog Timer



NOTE:

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

The Watchdog Timer is a hardware-based timer that attempts to restart the system when it stops working. The system may stop working because of external EMI or software bugs. The Watchdog Timer ensures that standalone systems like ATMs will automatically attempt to restart in the case of system problems.

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 D-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.

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**NOTE:**

The Watchdog Timer is activated through software. The software application that activates the Watchdog Timer must also deactivate it when closed. If the Watchdog Timer is not deactivated, the system will automatically restart after the Timer has finished its countdown.

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

E

Hazardous Materials Disclosure

E.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

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 table on the next page.

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Printed Circuit Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Metal Fasteners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cable Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fan Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Power Supply Assemblies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Battery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

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

IVS-100-BT Advanced Auto Data Server

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	○	○	○	○	○	○
显示	○	○	○	○	○	○
印刷电路板	○	○	○	○	○	○
金属螺帽	○	○	○	○	○	○
电缆组装	○	○	○	○	○	○
风扇组装	○	○	○	○	○	○
电力供应组装	○	○	○	○	○	○
电池	○	○	○	○	○	○

○: 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/T11363-2006 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/T11363-2006 标准规定的限量要求。