IEI Technology Corp.

MODEL:
IKARPC-W08A-MeeGo

In-Vehicle Panel PC with Touch Screen Intel® Atom™ CPU, Gigabit Ethernet, OBD-ll, DVB-T, USB, Audio, RS-232/422/485, RoHS Compliant, IP 54 Protection

User Manual

Rev. 1.11 – 9 November, 2011

RoHS Lead Free

Revision

Date	Version	Changes
9 November, 2011	1.11	Updated Figure 3-9: OBD-II Connector Pinouts Location
5 October, 2011	1.10	Updated for R11 version
3 May, 2011	1.00	Initial release

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Table of Contents

List of Figures

List of Tables

BIOS Menus

Chapter

1

Introduction

1.1 Overview

Figure 1-1: IKARPC-W08A-MeeGo Panel PC

The IKARPC-W08A-MeeGo is an 8" panel PC designed for in-car use.

At the heart of the system is the Intel® Atom™ processor, offering low power in a powerful package. The chipset is rounded off with the Intel® US15WP.

The IKARPC-W08A-MeeGo is a MeeGo system that offers a multimedia experience with a built-in camera, microphone and speakers. Other peripherals include two USB ports, an RS-232/422/485 port, one GbE port and an audio input. Wireless networking capabilities include Bluetooth 2.0 and 802.11 b/g/n.

1.2 Features

There are four models in the IKARPC-W08A-MeeGo. Both models feature the following:

- Intel® Atom™ processor
- Intel® US15WP chipset
- On-board 1.0 GB 533 MHz DDR2 memory
- 802.11 b/g/n wireless/Bluetooth combo
- Two USB 2.0 ports
- IP 54 compliant front panel
- 3.5G connectivity (supports HSUPA/CDMA)
- OBD-II connector
- DVB-T antenna connector

- Touch screen
- RoHS compliance

1.3 Front Panel

The front of the IKARPC-W08A-MeeGo is a flat panel screen with a plastic frame. The components on the front panel are list below:

- Top edge:
  - 30 K pixel webcam
  - Microphones
  - LED indicators (see **Section 1.3.1**)
  - Ambient light sensor
- Right edge:
  - 6 x Programmable buttons (refer to **Section 4.1.2.3**)
  - Directional button combo pad
- Bottom edge:
  - LCD on/off button
  - Brightness down button
  - Brightness up button
  - Volume down button
  - Volume up button
- Left edge:
  - Power button
  - Speaker

Figure 1-2: Front View

1.3.1 LED Indicators

The LED indicators on the front panel show the status of GPRS/HSUPA, Wi-Fi/Bluetooth and DVB-T connection as well as HDD activity.

Figure 1-3: LED Indicators

1.4 Rear Panel

The rear panel has VESA mounting screw holes and an access panel for upgrading or changing the peripheral cards inside.
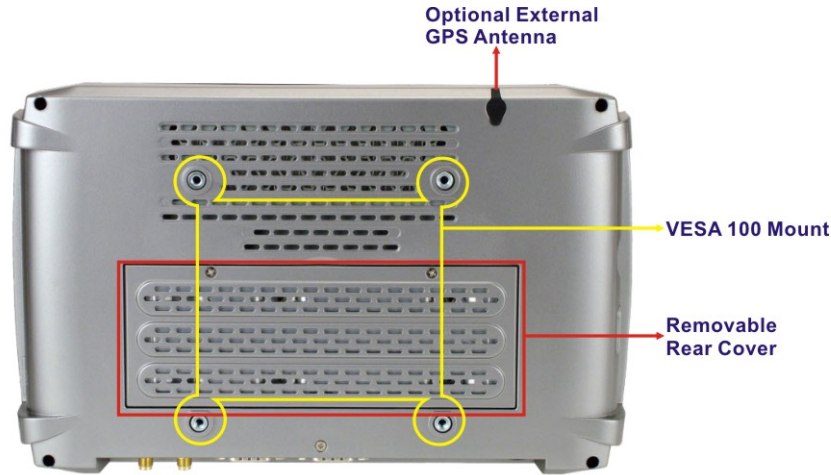
Figure 1-4: Rear View

1.5 Right Panel

The right panel has one USB host port and one smart card reader.

Figure 1-5: Right Panel

1.6 Left Panel

The left panel has a SD card slot, an audio line-out jack and an audio line-in jack.

Figure 1-6: Left Panel

1.7 Bottom Panel

The following are found on the bottom panel.

- 1 x 9 V~ 30 V DC input connector
- 1 x ACC/DC switch
- 1 x USB port
- 1 x Gigabit Ethernet RJ-45 port
- 1 x DB-9 connector (connects to OBD-II with included cable)
- 1 x DB-9 connector (RS-232/422/485, select via BIOS)
- 1 x DVB-T antenna connector
- 1 x GPRS antenna connector
- 1 x GPS antenna connector
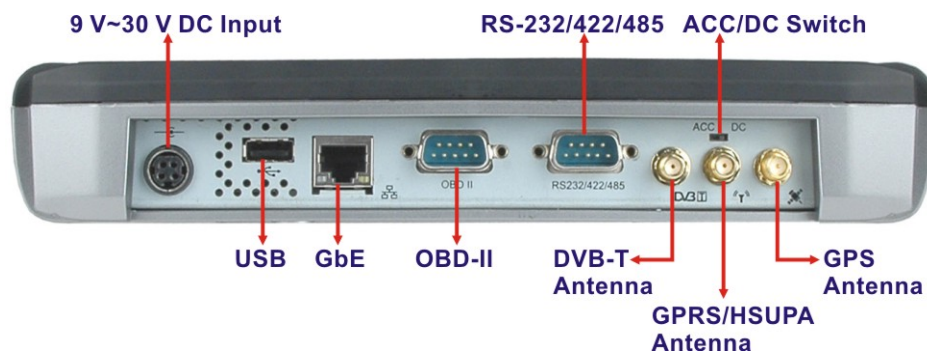
Figure 1-7: Bottom Panel

1.8 Internal Overview

After opening the rear access panel the following components are accessible.

- 1 x OBD-II card
- 1 x Wi-Fi/Bluetooth combo card (PCIe Mini)
- 1 x 3G network card (optional)
- 1 x DVB-T card (PCIe Mini) (optional)

1.9 System Specifications

The technical specifications for the IKARPC-W08A-MeeGo systems are listed in **Table 1-1.**

System	
CPU	1.1 GHz Intel® Atom™ Z510
Chipset	Intel® US15WP
Memory	On-board 1.0 GB 533 MHz DDR2 memory
OS	MeeGo IVI
Storage	1 x 4 GB CompactFlash® card (500x) preinstalled 1 x SD card slot
Audio	1 x Speaker (1 W)
Camera	1 x 30 K pixels webcam with digital microphones
Display	
LCD	8″ LCD with resistive touchscreen and auto-dimming
Max. Resolution	800 x 480 (WVGA)
Brightness (cd/m^2)	600 nits
Viewing Angle (H-V)	140 / 120
Surface Treatment	Anti-glare sunlight readable, hard coating
Communication	
LAN	1 x 10/100/1000 Mbps RJ-45
Wireless LAN	802.11b/g/n
Bluetooth	Bluetooth 2.1 + EDR Class 1
WWAN	HSPA/UMTS-800/850/900/1900/2100MHz Quad-band EDGE/GPRS/GSM-850/900/1800/1900MHz Dual-band EV-DO/CDMA
GPS	Support GPS with built-in antenna Expandable external antenna
Embedded Module	1 x OBD-II card 1 x Wi-Fi/Bluetooth combo card (PCIe Mini) 1 x 3G network card (optional) 1 x DVB-T card (PCIe Mini) (optional)

Power	
Power Input	9 V ~ 30 V DC input
Power Consumption	22.2 W (9 V @ 2.4685A, 12 V @ 1.8292A) ~ 23 W (30 V @ 0.7922A)
Physical Character	
Construction Material	ABS + PC plastic front frame
Mounting	Suction mount (VESA 100 mm x 100 mm)
Dimensions (W x H x D)	261.2 mm x 162 mm x 44.2 mm
Operation Temperature	-20°C ~ 60°C
Humidity	5% ~ 95% non-condense
Net weight	1.73 kg
IP level (front panel)	IP 54
Safety	CE-LVD, CB/CE-EMC, FCC, E-mark
Connectors and Buttons	
Antenna Connectors	1 x SMA 3.75G antenna connector 1 x SMA DVB-T antenna connector 1 x SMA GPS antenna connector
I/O Ports and Switches	1 x 9 V~ 30 V DC input connector 1 x ACC/DC switch 2 x USB Host ports 1 x Gigabit Ethernet RJ-45 port 1 x DB-9 connector (connects to OBD-II with included cable) 1 x DB-9 connector (RS-232/422/485) 1 x Audio line-in jack 1 x Audio line-out jack 1 x Smart card slot 1 x SD card slot
Front Panel Buttons	1 x Power button 1 x LCD on/off 2 x Brightness control 2 x Volume control 1 x Five-way navigation button 6 x Programmable buttons

Table 1-1: Technical Specifications

1.10 Dimensions

The dimensions are shown below.
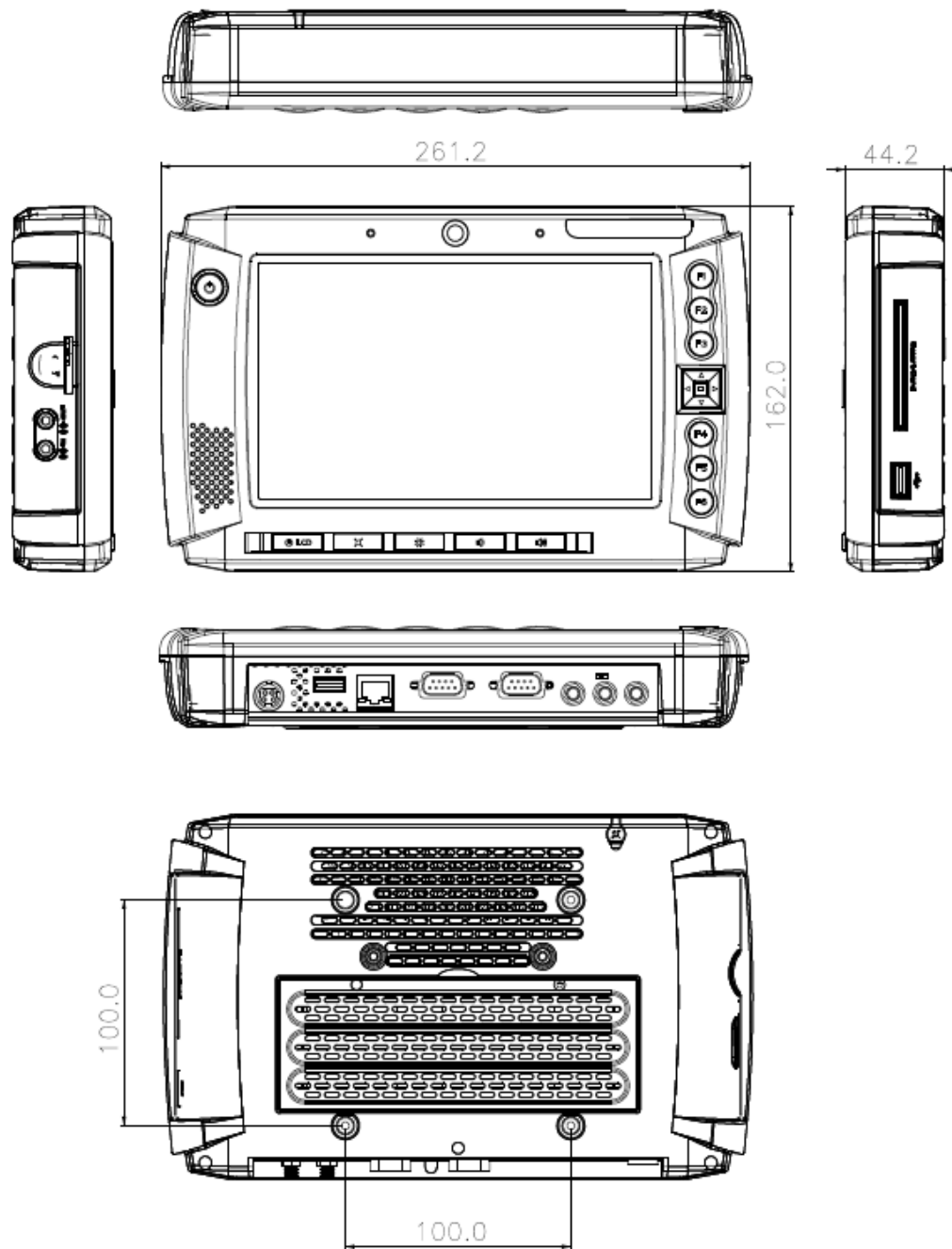
Figure 1-8: Dimensions (unit: mm)

Chapter

2

Unpacking

To unpack the panel PC, follow the steps below:

WARNING!

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the system has been properly installed. This ensures the screen is protected during the installation process.

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

Step 2: Open the external (second) box.

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

Step 4: Lift the monitor out of the boxes.

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

Step 6: Pull the plastic cover off the flat panel PC.

Step 7: Make sure all the components listed in the packing list are present. **Step 0:**

The IKARPC-W08A-MeeGo is shipped with the following components:

Quantity	Item	Image
1	IKARPC-W08A-MeeGo	
1	Cigarette lighter power cable (P/N: 32002-001700-100-RS)	

Quantity	Item	Image
1	ACC power cable (P/N: 32002-000901-100-RS)	
1	Remote control (P/N: 7Z000-8T00322ICP06G-RS)	
1	GPS/GSM antenna (P/N: 32506-000100-100-RS)	
1	DVB-T antenna (P/N: 32511-000100-100-RS)	
1	OBD-II cable (P/N: 32025-000300-100-RS)	
1	J1939/FMS cable (P/N: 32025-000400-100-RS)	
1	User manual CD and driver CD	

Table 2-1: Packing List

Item	Image
12 V DC power adapter with 4-pin DIN connector (P/N: 63000-FSP036RAB614-RS)	
Vehicle mounting kit (1) (P/N: IKARPC-W08A-MK01-R10)	
Vehicle mounting kit (2) (P/N: IKARPC-W08A-MK02-R10)	

Table 2-2: Optional Items

If any of these items are missing or damaged, contact the distributor or sales representative immediately.

Chapter

3

Installation

3.1 Anti-static Precautions

> ⚡ **WARNING:**
>
> Failure to take ESD precautions during the maintenance of the IKARPC-W08A-MeeGo may result in permanent damage to the IKARPC-W08A-MeeGo and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IKARPC-W08A-MeeGo. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IKARPC-W08A-MeeGo 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 IKARPC-W08A-MeeGo, place it on an antic-static pad. This reduces the possibility of ESD damaging the IKARPC-W08A-MeeGo.
- **Only handle the edges of the PCB**: - When handling the PCB, hold the PCB by the edges.

3.2 Installation Precautions

When installing the flat panel PC, please follow the precautions listed below:

- **Power turned off**: When installing the flat panel PC, 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 rear panel of the flat panel PC, to configure the jumpers or plug in added peripheral devices, ground themselves first and wear and anti-static wristband.

3.3 Installation and Configuration Steps

The following installation steps must be followed.

Step 1:   Unpack the system

Step 2:   Install a 3G SIM card (optional)

Step 3:   Configure the system

Step 4:   Connect peripheral devices

Step 5:   Mount the system

Step 6:   Power up the system

3.4 SIM Card Installation (Optional)

To install the SIM card, the cover plate must be removed. To remove the cover plate and install the SIM card, follow the instructions below.

Step 1:   Remove the retention screws and lift the cover off the IKARPC-W08A-MeeGo.

Figure 3-1: Back Cover Retention Screws

Step 2: If a DVB-T module is installed in the system, remove the DVB-T module by removing the antenna cable and two retention screws.
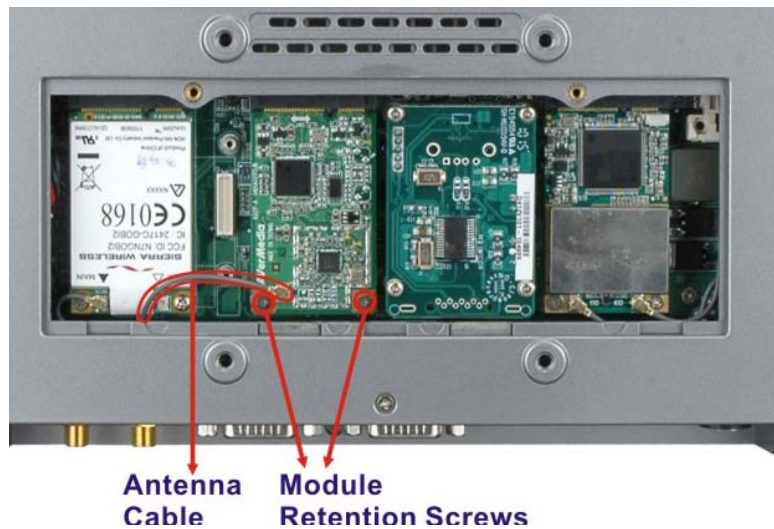
Figure 3-2: DVB-T Module Retention Screws

Step 3: Location the SIM card slot. Slide to the left to open the slot cover.

Figure 3-3: Open the SIM Card Slot Cover

Step 4: Insert the SIM card into the slot and close the slot cover. Slide the slot cover to the right to lock the cover.

Figure 3-4: Lock the SIM Card Slot Cover

Step 5: Once installed, reconnect the antenna cable to the DVB-T module first, then replace the DVB-T module with previously removed screws.

Step 6: Replace the back cover.

3.5 Mounting the System

To mount the system, please follow the steps below.

Step 1: Align the screw holes on the VESA mounting plate with the screw holes on the monitor rear panel.

Step 2: Insert the four monitor mounting screws into the four screw holes on the real panel and tighten until the screw shank is secured against the rear panel (**Figure 3-5**).
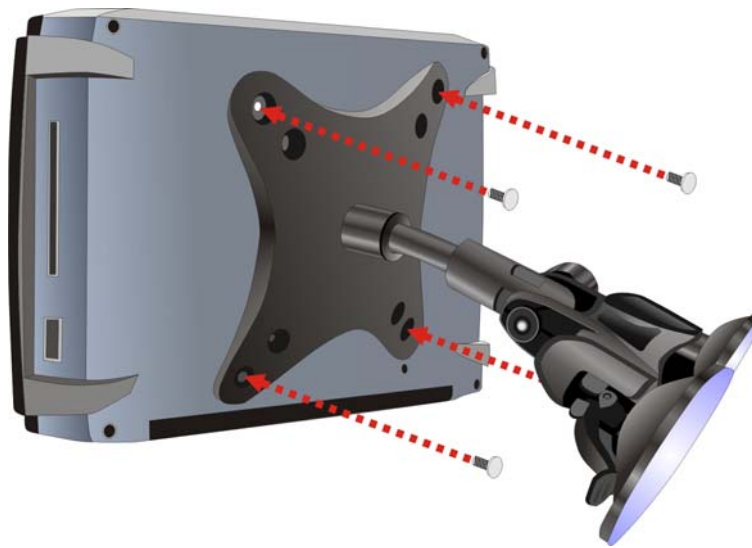
Figure 3-5: Secure the Mounting Kit

Step 3:   Select a suitable place on the windshield to mount the IKARPC-W08A-MeeGo, then clean and dry it.

Step 4:   Attach the suction cups to the windshield. Make sure the levers on the suction cups are against the windshield (**Figure 3-6**).

Step 5:   Press the suction cups and flip the levers toward the windshield to secure the mounting kit (**Figure 3-6**).
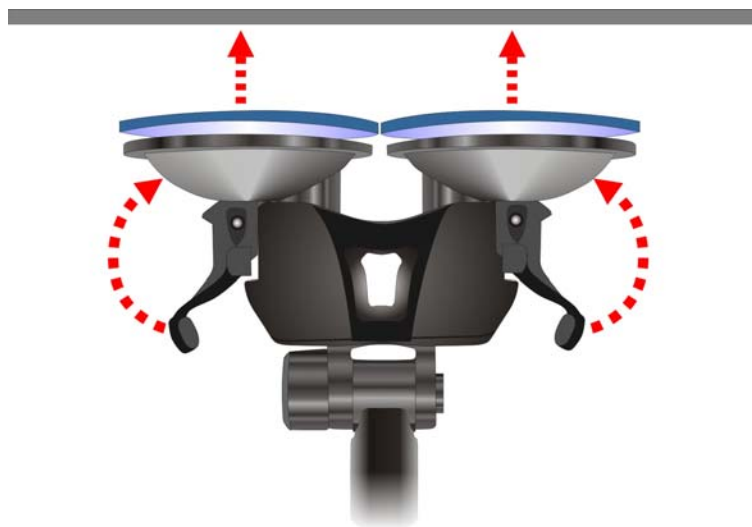
Figure 3-6: Attach the Suction Cups

3.6 Bottom Panel Connectors

This section provides and overview of the connectors on the bottom panel.

3.6.1 LAN Connection

The RJ-45 connector enables connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connector** on the bottom panel of the IKARPC-W08A-MeeGo.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with the RJ-45 connector on the bottom panel of the IKARPC-W08A-MeeGo.
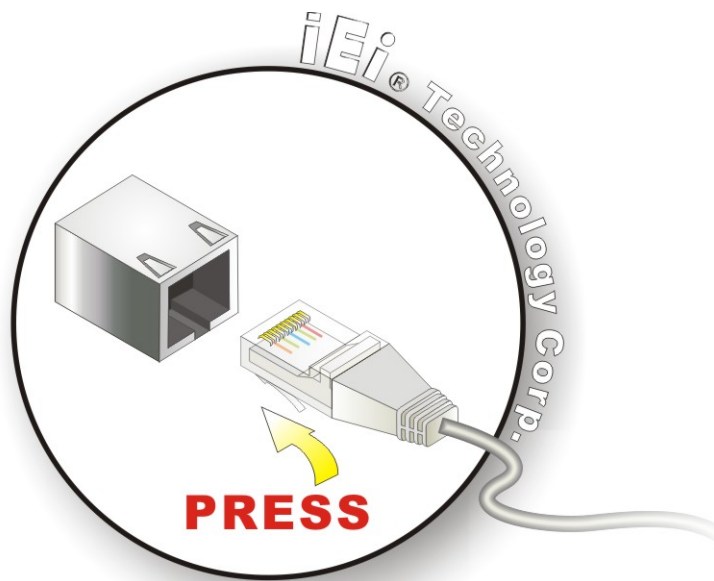
Figure 3-7: LAN Connection

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

3.6.2 OBD-II Connector

The IKARPC-W08A-MeeGo has one DB-9 connector for OBD-II connection. Use the OBD-II cable or J1939/FMS cable (**Figure 3-8**) in the package to connect the IKARPC-W08A-MeeGo with the vehicle.

OBD-II Cable   J1939/FMS Cable

Figure 3-8: OBD-II Cable and J1939/FMS Cable

The pinouts for OBD-II connector are listed in the table below.
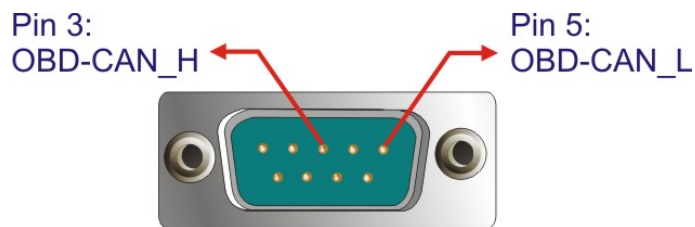
Figure 3-9: OBD-II Connector Pinouts Location

Pin	Description
1	NC
2	NC
3	E_OBD-CAN_H
4	NC
5	E_OBD-CAN_L
6	NC
7	NC
8	NC
9	NC

Table 3-1: OBD-II Connector Pinouts

The pinout locations of OBD-II cable connector and J1939/FMS cable connector are shown below.
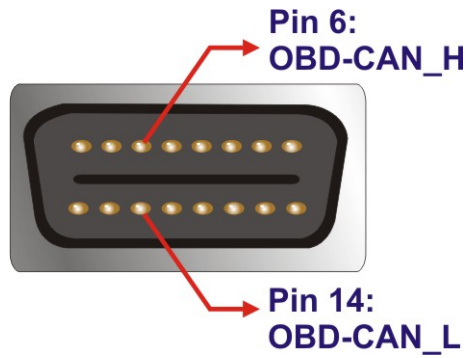
Figure 3-10: OBD-II Connector Pinouts
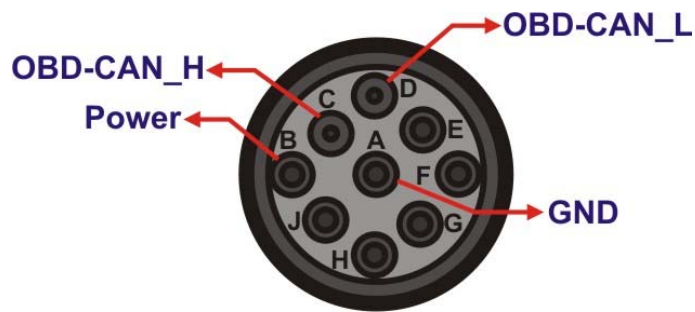
Figure 3-11: J1939/FMS Connector Pinouts

3.6.3 Power Input Connection

The IKARPC-W08A-MeeGo has one 9 V~30 V DC input connector on the bottom panel.
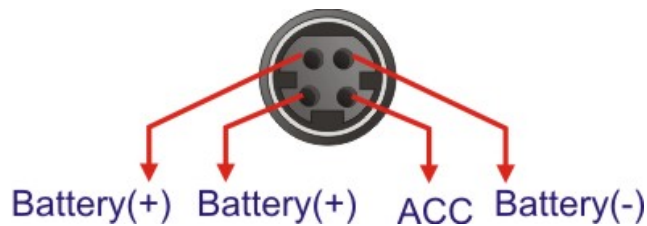
Figure 3-12: Power Input Connector

The IKARPC-W08A-MeeGo can use either ACC power or DC power from the vehicle. To use DC power, connect the IKARPC-W08A-MeeGo to the vehicle cigarette lighter connector through the cigarette lighter cable. See **Figure 3-13**.

Figure 3-13: Cigarette Lighter Cable

To use ACC power, connect the IKARPC-W08A-MeeGo to the vehicle through the ACC power cable. See **Figure 3-14**.

Figure 3-14: ACC Power Cable

3.6.4 Serial Device Connection

The IKARPC-W08A-MeeGo has one male DB-9 connector on the bottom panel for serial devices to be connected. Follow the steps below to connect a serial device to the IKARPC-W08A-MeeGo.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 1**.

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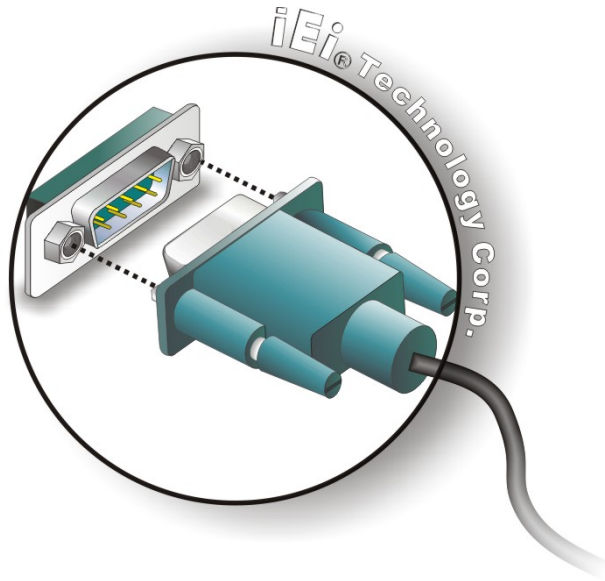
Figure 3-15: Serial Device Connector

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

3.6.4.1 COM1 Pinouts

The COM1 connector can be set as RS-232 (default), RS-422 or RS-485 in BIOS. The pinouts for COM1 are listed in the table below.

Pin	RS-232	RS-422	RS-485
1	DCD	RX-	
2	RX	RX+	
3	TX	TX-	DATA-
4	DTR		
5	GND	GND	GND
6	DSR		
7	RTS	TX+	DATA+
8	CTS		
9	RI		

Table 3-2: COM1 Connector Pinouts

3.6.5 USB Device Connection

There is one external USB connector. To connect a USB device, please follow the instructions below.

Step 1: **Located the USB connector**. The location of the USB connector is shown in **Chapter 1**.

Step 2: **Align the connectors.** Align the USB device connector with the connector on the bottom panel.
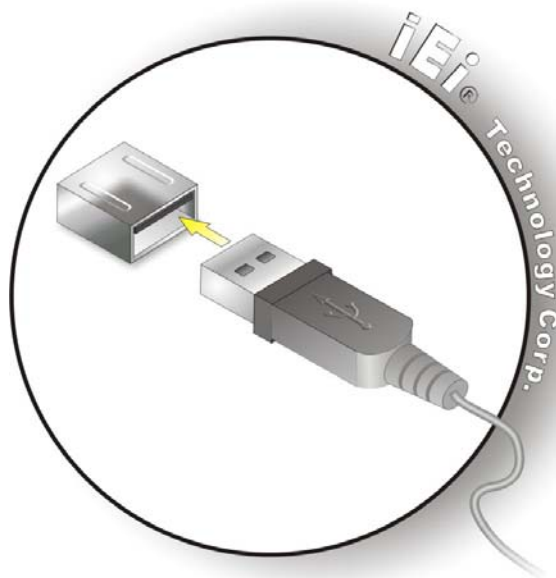
Figure 3-16: USB Device Connection

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

3.7 Power-On Procedure

3.7.1 Installation Checklist

![WARNING icon] **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 embedded system please make sure of the following:

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

3.7.2 Power-on Procedure

To power-on the IKARPC-W08A-MeeGo please follow the steps below:

Step 1: Connect either the cigarette lighter power cable or ACC power cable from the IKARPC-W08A-MeeGo to the vehicle.

Step 2: Make sure to adjust the ACC/DC switch to the right position.

- Use cigarette power cable: switch to DC mode
- Use ACC power cable: switch to ACC mode

Figure 3-17: Power Connector and ACC/DC Switch

Step 3:   Push the power button for **five seconds** until the power LED turns to blue. See

Figure 3-18.

Figure 3-18: Power Button

3.7.3 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 IKARPC-W08A-MeeGo software application.
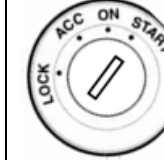
	LOCK	ACC	ON	START
ACC Signal	Off	On	On	Off
Car Cigarette Lighter	Off	On	On	Off
5 V Standby Power	Off	On after 1 second	On	On
Auto Start-up	--	After 10~60 seconds (selectable)		--
Auto Shut-down	After 10~180 secs (selectable)	--	--	--

Table 3-3: Power Sate and Ignition System

3.8 Remote Control

User can also use the remote control that comes with the IKARPC-W08A-MeeGo to control the system. **Figure 3-19** shows the overview of the remote control.

Figure 3-19: Remote Control

3.9 System Maintenance

If the components of the IKARPC-W08A-MeeGo fail, they must be replaced. Please contact the system reseller or vendor to purchase the replacement parts.

NOTE:

A user cannot replace a motherboard. If the motherboard fails it must be shipped back to IEI to be replaced. Please contact the system vendor, reseller or an IEI sales person directly.

Chapter

4

SDK and Driver

4.1 IKARPC SDK

IEI provides a SDK for the IKARPC-W08A-MeeGo. The SDK is developed with Qt framework which is also used by the MeeGo API. There are three demo applications developed by the SDK, including camera demo, hotkey demo and OBD demo. These demo applications are all installed in the IKARPC-W08A-MeeGo.

4.1.1 Camera Demo

In the camera demo application, VLC library is used to enable the front panel camera of the IKARPC-W08A-MeeGo to capture images.
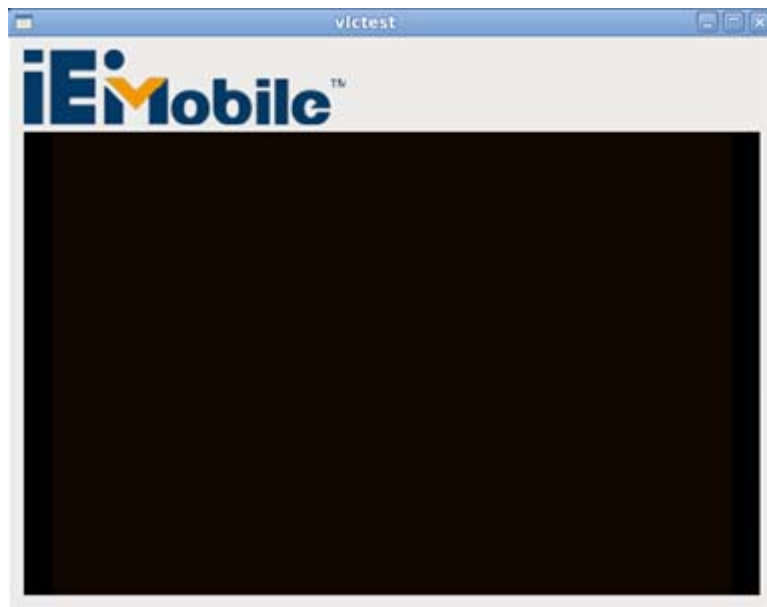
Figure 4-1: Camera Demo Application

4.1.1.1 Qt Environment Setup

1. Add LIBS in .pro file:

```
LIBS += -lvlc
```

2. Include header:

```
#include <vlc/vlc.h>
```

The SDK is compiled in the following VLC library versions:

- libvlccore.so.2.1.2
- libvlc.so.2.2.1

4.1.1.2 Use VLC API (playFile) to Enable Camera

Declare an instance of player in Qt:

```
Player p;
p.playFile("v4l2:///dev/video0");
```

4.1.1.3 Camera Demo Application

The camera demo application is located at:

/home/meego/Application_demo/camera_demo

```
#  cd /home/meego/Application_demo/
#  ./camera_demo
```

4.1.2 Hotkey Demo

The front panel of the IKARPC-W08A-MeeGo has several hotkeys, including

- Right edge:
  - Six programmable buttons
  - Directional button combo pad
- Bottom edge:
  - LCD on/off button
  - Brightness down button
  - Brightness up button
  - Volume down button
  - Volume up button

The following section describes how to program these hotkeys.
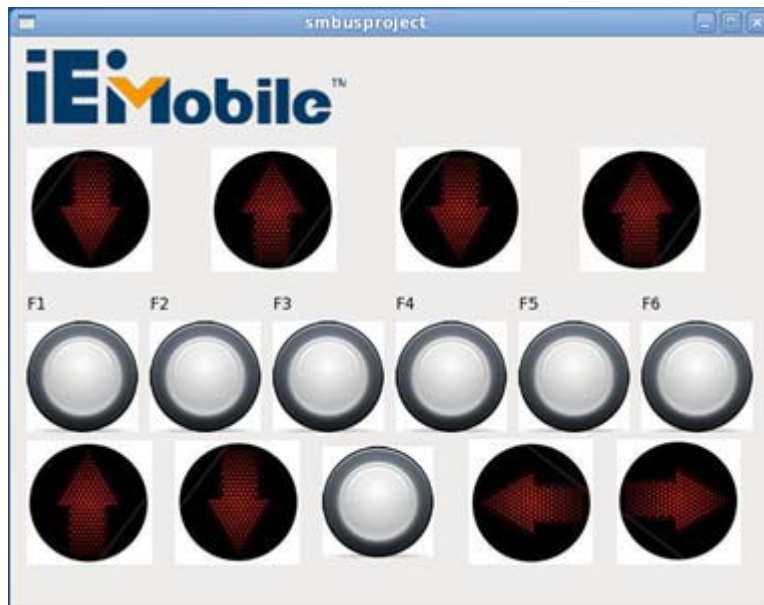
Figure 4-2: Hotkey Demo Application

4.1.2.1 Qt Environment Setup

1. Add LIBS in .pro file:

```
LIBS += -lsmbus
```

2. Include header:

```
#include <smbus.h>
```

The SDK is compiled in the following smbus library version:

- libsmbus.so.1.0.0

4.1.2.2 libsmbus.so.1.0.0 API

```
int read_smbus(char command)
input: char, command
output: void
return int, read data
```

Examples:

1. Read current brightness value:

```
brightness = read_smbus(0x01);
```

2. Read current volume value:

```
volume = read_smbus(0x02);
```

3. Read which function key was pressed:

```
pressed = read_smbus(0x1d);
```

```
Int write_smbus(char command, char data)
Input: char, command, char,  write in data
Output: void
Return: 0 for false, 1 for true
```

Examples:

1. Write brightness value in:

```
write_smbus(0x01, 10);
```

2. Write volume value in:

```
write_smbus(0x02, 8);
```

4.1.2.3 Hotkey Demo Application

The hotkey demo application is located at: /home/meego/Application_demo/hotkey_demo

```
#  cd /home/meego/Application_demo/
#  ./hotkey_demo
```

4.1.3 OBD Demo

The OBD demo application offers an interface to read OBD data from a vehicle.

Figure 4-3: OBD Demo Application

The OBD demo application is located at:

/home/meego/Application_demo/obd

```
#  cd /home/meego/Application_demo/
#  ./obd
```

4.2 IKARPC Driver

All the drivers required for the components of the IKARPC-W08A-MeeGo are installed in the system. However, some drivers are also included in the driver CD for future use. The driver CD includes:

Figure 4-4: Driver Menu

- EMGD: Intel® Embedded Media and Graphics Driver
- Touch: touchscreen driver
- Wi-Fi and Bluetooth driver

The components not listed above do not need any drivers to function once the MeeGo is installed.

4.3 Enable Network Connectivity

4.3.1 Enable 3G Connection

To enable the 3G connection, please run the following commands.

```
#  cd /home/meego/Utilities/
#  ./3g
#  ./pppca
```

4.3.2 Enable Wi-Fi Connection

To enable the Wi-Fi connection, please follow the steps below.

Step 1: Click "Tools" from the MeeGo taskbar.

Figure 4-5: MeeGo Taskbar - Tools

Step 2: Double click "Tools" to bring up the submenu.

Step 3: Click "Settings". Double click "Settings" to bring up the Settings window.
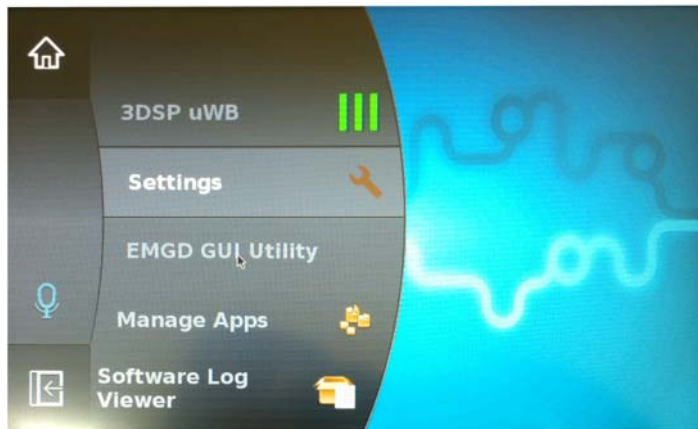
Figure 4-6: MeeGo Taskbar - Settings

Step 4: Click Connectivity.
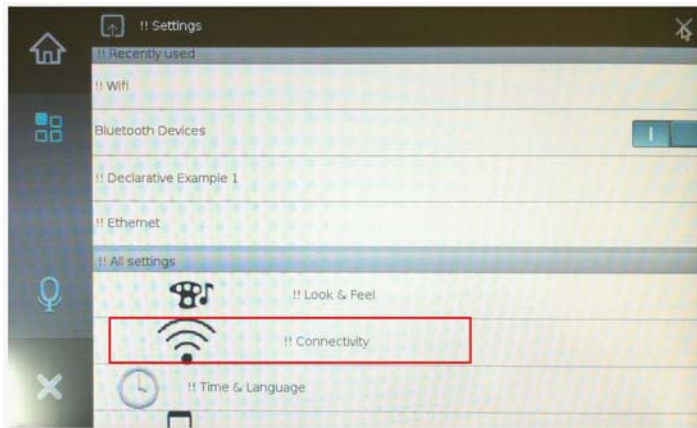
Figure 4-7: Settings - Connectivity

Step 5:   Click Wifi.
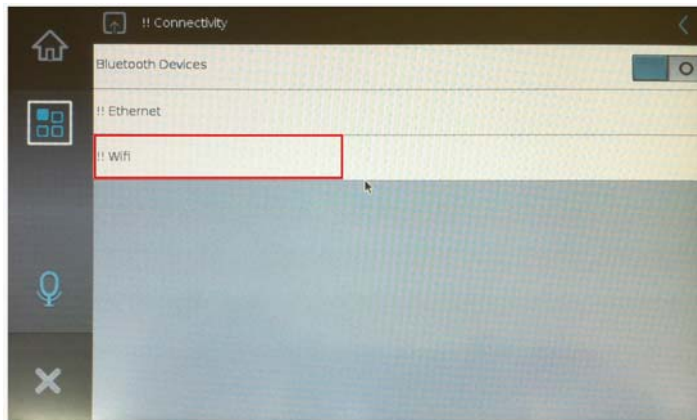
Figure 4-8: Connectivity – Wi-Fi

Step 6:   Swap the button to enable the Wi-Fi connection. The available wireless network

will show. Select one wireless network for the Wi-Fi connection.
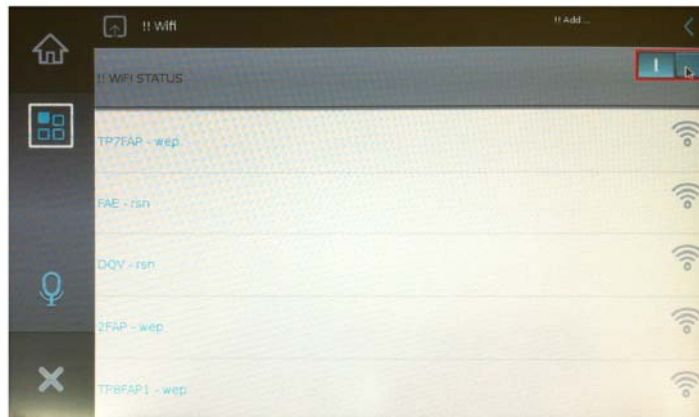
Figure 4-9: Wi-Fi Settings

4.3.3 Enable Bluetooth Connection

To enable the Bluetooth connection, please follow the steps below.

Step 1: Follow **Step 1 ~ Step 4** of the previous section (**Section 4.3.2**)

Step 2: Click Bluetooth.
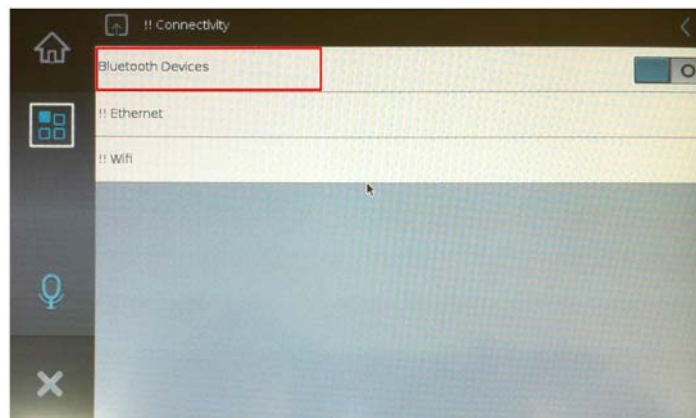
Figure 4-10: Connectivity – Bluetooth

Step 3: Swap the button to enable the Bluetooth connection. In the Bluetooth setting window, the user can also make the system visible or discover other Bluetooth-enabled devices.
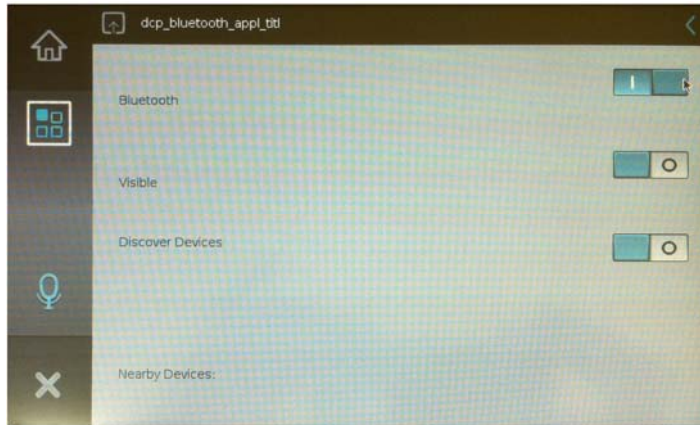
Figure 4-11: Wi-Fi Settings

4.4 Customize MeeGo Menu

4.4.1 Customize Taskbar Style

The MeeGo taskbar interface style can be customized. To customize the taskbar style, please access the "settings.xml" file at */usr/share/ivihome/settings.xml.* Edit the context of the settings.xml to change the interface style.

For example:

1. Edit the background color of the taskbar to blue.
Configure the code in the following line to "0000ffb1".
`<taskbar_bgcolor1>0000ffb1</taskbar_bgcolor1>`

2. Edit the width of the taskbar to 80 pixels.
Configure the code in the following line to "80".
`<taskbar_width>80</taskbar_width>`

4.4.2 Add/Customize Taskbar Application Icon

The user can add or edit the application icon of the MeeGo taskbar.

To edit the existing application icon, access the .desktop files in */usr/share/applications* to edit it.

To add a new application icon, create a .desktop file for the new application and add it to */usr/share/applications*.

4.5 Tool - Win32DiskImager

An image writing tool, Win32 Disk Imager, is provided in the utility CD. The Win32 Disk Imager is a Windows-based program that saves and restores images from removable drives, such as CF cards or USB drives.

The Win 32 Disk Imager can be found in the utility CD. Click the Tools button (**Figure 4-12**) to get the Win 32 Disk Imager.

It can also be downloaded from: https://launchpad.net/win32-image-writer

Figure 4-12: Utility CD - Tools

4.5.1 How to Use

Step 1: Launch the Win 32 Disk Imager by double clicking the icon.

Figure 4-13: The Win 32 Disk Imager Icon

Step 2: The Win 32 Disk Imager user interface appears.

Figure 4-14: Win 32 Disk Imager User Interface

Step 3: To write an image to a CF card, select a source image and the target device.

Click "Write" to write a bootable image into the device.

Step 4: To save an image to a CF card, name a target image file and select the source

device. Click "Read" to save the image.

Chapter

5

BIOS

5.1 Introduction

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

5.1.1 Starting Setup

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

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

If the message disappears before the DELETE key is pressed, restart the computer and try again.

5.1.2 Using Setup

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

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
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
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 /F3 key	Change color from total three colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

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

5.1.4 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.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Exit – Selects exit options and loads default settings

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

5.2 Main

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

```
                        BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot    Security  Chipset     Exit

 System Overview                                   Use [ENTER], [TAB] or
 ─────────────────────────────────────────────     [SHIFT-TAB] to select a
 AMIBIOS                                            field.
 Version     :08.00.15
 Build Date :08/12/10                              Use [+] or [-] to
 ID:         :H531MR11                             configure system time.

 Processor
 Intel(R) Atom(TM) CPU Z510 @ 1.10GHz
 Speed       :1100MHz
 Count       :1
                                                   ←→   Select Screen
 System Memory                                     ↑↓   Select Item
 Size         :1019MB                              Enter Go to SubScreen
                                                   F1    General Help
 System Time                    [14:20:27]         F10   Save and Exit
 System Time                    [Tue 05/06/2008]   ESC   Exit

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```

BIOS Menu 1: Main

➔ **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- ▪ AMI BIOS: Displays auto-detected BIOS information
    - ○ **Version:** Current BIOS version
    - ○ **Build Date:** Date the current BIOS version was made
    - ○ **ID:** Installed BIOS ID
- ▪ Processor: Displays auto-detected CPU specifications
    - ○ **Type:** Names the currently installed processor
    - ○ **Speed:** Lists the processor speed
    - ○ **Count:** The number of CPUs on the motherboard
- ▪ System Memory: Displays the auto-detected system memory.
    - ○ **Size:** Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

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

➔ **System Date [xx/xx/xx]**

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

5.3 Advanced

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

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

- CPU Configuration (see **Section 5.3.1**)
- IDE Configuration (see **Section 5.3.2**)
- Super IO Configuration (see **Section 5.3.3**)
- Hardware Health Configuration (see **Section 5.3.4**)
- Remote Access Configuration (see **Section 5.3.5**)
- USB Configuration (see **Section 5.3.6**)

```
                      BIOS  SETUP  UTILITY
   Main    Advanced   PCIPNP    Boot    Security  Chipset      Exit

 Advanced Settings                             Configure CPU
 _____

 WARNING: Setting wrong values in below sections may cause
 system to malfunction

 > CPU Configuration
 > IDE Configuration
 > SuperIO Configuration
 > Hardware Health Configuration           ←→   Select Screen
 > Remote Access Configuration             ↑↓   Select Item
 > USB Configuration                       Enter Go to SubScreen
                                           F1   General Help
                                           F10  Save and Exit
                                           ESC  Exit
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```
BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.

```
                      BIOS  SETUP  UTILITY
   Main    Advanced   PCIPNP    Boot    Security  Chipset      Exit

 Configure Advanced CPU Settings
 Module Version – 3F.14
 _____

 Manufacturer  :Intel®
 Intel(R) Atom(TM) CPU Z510 @ 1.10GHz
 Frequency     :1.10GHz
 FSB Speed     :400MHz
                                           ←→   Select Screen
 Cache L1      : 24KB                       ↑↓   Select Item
 Cache L2      : 512KB                      Enter Go to SubScreen
                                           F1   General Help
 Ratio Actual Value :11                     F10  Save and Exit
                                           ESC  Exit
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```
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer
- Brand String: Lists the brand name of the CPU being used

- Frequency: Lists the CPU processing speed
- FSB Speed: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.

```
                         BIOS SETUP UTILITY
    Main     Advanced   PCIPNP     Boot    Security  Chipset     Exit

 IDE Configuration                                      DISABLED: disable the
 ──────────────────────────────────────────────        integrated IDE
 ATA/IDE Configuration          [Enabled]               controller.
                                                        PRIMARY: enables only
 > Primary IDE Master           : [Hard Disk]           the Primary IDE
 > Primary IDE Slave            : [Not Detected]        controller
                                                        SECONDARY: enables only
                                                        the Secondary IDE
                                                        controller.
                                                        BOTH: enables both IDE
                                                        controllers

                                                        ←→   Select Screen
                                                        ↑ ↓   Select Item
                                                        Enter Go to SubScreen
                                                        F1    General Help
                                                        F10   Save and Exit
                                                        ESC   Exit
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```
    BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configurations [Enabled]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

➔ **Disabled**   Disables the on-board ATA/IDE controller.

➔ **Enabled**   DEFAULT   Enables the on-board ATA/IDE controller.

➔ **IDE Master and IDE Slave**

When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- ▪ Primary IDE Master
- ▪ Primary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.

```
                          BIOS SETUP UTILITY
   Main     Advanced    PCIPNP     Boot     Security  Chipset      Exit

 Primary IDE Master                                        Select the type of device
 _____   connected to the system
 Device       :Not Detected

 Type                         [Auto]
 LBA/Large Mode               [Auto]
 Block (Multi-Sector Transfer)[Auto]
 PIO Mode                     [Auto]          ←→   Select Screen
 DMA Mode                     [Auto]          ↑ ↓  Select Item
 S.M.A.R.T.                   [Auto]          Enter Go to SubScreen
 32Bit Data Transfer          [Enabled]       F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit

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```

BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**　　　　BIOS is prevented from searching for an IDE disk drive on the specified channel.

➔ **Auto**　　DEFAULT　　The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD**　　　　The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD**   This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

ZIP

LS-120

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**   BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto**   **DEFAULT**   BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**   BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto**   **DEFAULT**   BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** DEFAULT BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s

➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s

(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto** DEFAULT BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

➔ **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s

➔ **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s

➔ **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s

➔ **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s

➔ **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s

➔ **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s

➔ **UDMA0** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s

➔ **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s

➔ **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s

➔ **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto** DEFAULT BIOS auto detects HDD SMART support.

➔ **Disabled** Prevents BIOS from using the HDD SMART feature.

➔ **Enabled** Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** DEFAULT Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

```
                        BIOS SETUP UTILITY
    Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 Configure Super I/O Chipset                    Allows BIOS to select
 ─────────────────────────────────────         Serial Port Base
 Serial Port1 Address          [3F8]           Addresses
   Serial Port1 IRQ            [IRQ4]
 Select Serial port mode       [RS232]
 Select Serial port RI# mode   [RI#]

                                               ←→   Select Screen
                                               ↑ ↓  Select Item
                                               Enter Go to SubScreen
                                               F1   General Help
                                               F10  Save and Exit
                                               ESC  Exit

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```
   BIOS Menu 6: Super IO Configuration

➔   **Serial Port1 Address [3F8]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔   **Disabled**   No base address is assigned to Serial Port 1

➔   **3F8**   **DEFAULT**   Serial Port 1 I/O port address is 3F8

➔   **2F8**   Serial Port 1 I/O port address is 2F8

➔   **3E8**   Serial Port 1 I/O port address is 3E8

➔   **2E8**   Serial Port 1 I/O port address is 2E8

➔   **Serial Port1 IRQ [IRQ4]**

Use the **Serial Port1 IRQ** option to select the interrupt address for serial port 1.

➔   **IRQ3**   Serial port 1 IRQ address is 3

➔   **IRQ4**   **DEFAULT**   Serial port 1 IRQ address is 4

➔ **Select Serial Port Mode [RS232]**

Use the **Select Serial Port Mode** option to select the Serial Port 1 signaling mode.

➔ **RS422**   Serial Port 1 signaling mode is RS-422

➔ **RS485**   Serial Port 1 signaling mode is RS-485

➔ **RS232**   DEFAULT   Serial Port 1 signaling mode is RS-232

➔ **Select Serial Port RI# [RI#]**

Use the **Select Serial Port RI#** option to select the Serial Port 1 signaling mode.

➔ **5V**   Pin 9 on Serial Port 1 is designated as a 5 V power supply

➔ **RI#**   DEFAULT   Pin 9 on Serial Port 1 is set as the normal ring (RI) signal

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.

```
                        BIOS SETUP UTILITY
   Main     Advanced   PCIPNP     Boot    Security  Chipset    Exit

 Hardware Health Event Monitoring
 _____
 CPU Temperature Sensor          :51°C/123°F
 System Temperature Sensor       :50°C/122°F

 +VCC_CORE                       :1.104 V
 +5V                             :5.339 V
 +12V                            :12.936 V        ←→   Select Screen
 +1.8V                           :1.808 V         ↑ ↓  Select Item
 VCC                             :3.344 V         Enter Go to SubScreen
 VSB                             :3.360 V         F1   General Help
 VBAT                            :3.248 V         F10  Save and Exit
                                                  ESC  Exit

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```

BIOS Menu 7: Hardware Health Configuration

➔ **Hardware Health Monitoring**

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

- ▪ System Temperatures:
  - o CPU Temperature Sensor
  - o System Temperature Sensor
- ▪ Voltages:
  - o +VCC_CORE
  - o +5V
  - o +12V
  - o +1.8V
  - o VCC
  - o VSB
  - o VBAT

5.3.5 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 8**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.

```
                       BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot   Security  Chipset    Exit

Configure Remote Access type and parameters
──────────────────────────────────────────────────────
Remote Access                    [Disabled]


                                        ←→   Select Screen
                                        ↑↓   Select Item
                                        Enter Go to SubScreen
                                        F1    General Help
                                        F10   Save and Exit
                                        ESC   Exit
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```

BIOS Menu 8: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** DEFAULT Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below appear:

> Serial Port Number
>
> Serial Port Mode
>
> Redirection after BIOS POST
>
> Terminal Type

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

➔ **COM1** DEFAULT System is remotely accessed through COM1

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1

- ▪ 19200 8,n,1
- ▪ 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

---

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**   The console is not redirected after POST

➔ **Boot Loader**   Redirection is active during POST and during Boot Loader

➔ **Always**   DEFAULT   Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

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

➔ **ANSI**   DEFAULT   The target terminal type is ANSI

➔ **VT100**   The target terminal type is VT100

➔ **VT-UTF8**   The target terminal type is VT-UTF8

5.3.6 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 9**) to read USB configuration information and configure the USB settings.

```
                        BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot    Security  Chipset     Exit

USB Configuration                              Enables USB host
_____    controllers

Module Version – 2.24.3-13.4

USB Devices Enabled:
         None

USB Functions                  [Enabled]       ←→    Select Screen
USB 2.0 Controller             [Enabled]       ↑↓    Select Item
Legacy USB Support             [Enabled]       Enter Go to SubScreen
USB 2.0 Controller Mode        [HiSpeed]       F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit

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```

BIOS Menu 9: USB Configuration

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

▪ Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

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

➔ **USB Function [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled**　　　　　　　　USB function support disabled

➔ **Enabled**　　DEFAULT　　USB function support enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔ **Enabled**　　DEFAULT　　USB 2.0 controller enabled

➔ **Disabled**　　　　　　　　USB 2.0 controller disabled

➔ **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.

➔ **Disabled**   Legacy USB support disabled

➔ **Enabled**   DEFAULT   Legacy USB support enabled

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

➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed**   The controller is capable of operating at 12 Mb/s

➔ **HiSpeed**   DEFAULT   The controller is capable of operating at 480 Mb/s

5.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 10**) to configure advanced PCI and PnP settings.

> ⚡ **WARNING!**
>
> Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.

```
                        BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot    Security   Chipset    Exit

 Advanced PCI/PnP Settings                        Available: Specified IRQ
 _____      is available to be use
                                                  the PCI/PnP devices
 WARNING: Setting wrong values in below sections  Reserved: Specified IRQ
          may cause system to malfunction         is reserved for use by
 IRQ3                          [Reserved]          legacy ISA devices
 IRQ4                          [Reserved]
 IRQ5                          [Available]
 IRQ7                          [Available]
 IRQ9                          [Available]
 IRQ10                         [Available]
 IRQ11                         [Available]          ←→    Select Screen
 IRQ14                         [Available]          ↑ ↓   Select Item
 IRQ15                         [Available]          Enter Go to SubScreen
                                                    F1    General Help
 Reserved Memory Size          [Disabled]           F10   Save and Exit
                                                    ESC   Exit
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```

BIOS Menu 10: PCI/PnP Configuration

➔ **IRQ#**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available**   The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved**   The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14

▪ IRQ 15

➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled** DEFAULT No memory block reserved for legacy ISA devices

➔ **16K** 16 KB reserved for legacy ISA devices

➔ **32K** 32 KB reserved for legacy ISA devices

➔ **64K** 54 KB reserved for legacy ISA devices

5.5 Boot

Use the **Boot** menu (**BIOS Menu 11**) to configure system boot options.

```
                         BIOS SETUP UTILITY
   Main    Advanced    PCIPNP    Boot    Security   Chipset    Exit

 Boot Settings                                   Configure settings
───────────────────────────────────────────     during system boot.
 > Boot Settings Configuration

 > Boot Device Priority
 > Hard Disk Drives

                                                 ←→   Select Screen
                                                 ↑ ↓  Select Item
                                                 Enter Go to SubScreen
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit

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```

BIOS Menu 11: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 12**) to configure advanced system boot options.

```
                     BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot    Security  Chipset     Exit

 Boot Settings Configuration                        Allows BIOS to skip
                                                    certain tests while
                                                    booting. This will
 Quick Boot                    [Enabled]            decrease the time needed
 Quiet Boot                    [Enabled]            to boot the system.
 AddOn ROM Display Mode        [Force BIOS]
 Bootup Num-Lock               [On]
 Boot from LAN Support (82574L)  [Disabled]
                                                    ←→   Select Screen
                                                    ↑↓   Select Item
                                                    Enter Go to SubScreen
                                                    F1   General Help
                                                    F10  Save and Exit
                                                    ESC  Exit

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```

BIOS Menu 12: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**   No POST procedures are skipped

➔ **Enabled**   DEFAULT   Some POST procedures are skipped to decrease the system boot time

➔ **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

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**   DEFAULT   The system forces third party BIOS to display during system boot.

➔ **Keep Current**   The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **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.

➔ **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.

➔ **Boot From LAN Support (82574L) [Disabled]**

Use the **BOOT From LAN Support (82574L)** option to enable the Intel® 82574L PCIe GbE controller to boot the system.

➔ **Disabled**   DEFAULT   Cannot be booted from a remote system through the Intel® 82574L PCIe GbE controller

➔ **Enabled**   Can be booted from a remote system through the Intel® 82574L PCIe GbE controller

5.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 13**) to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

```
                        BIOS SETUP UTILITY
    Main    Advanced   PCIPNP    Boot   Security  Chipset    Exit

  Boot Device Priority                        Specifies the boot
  _____ sequence from the
                                              available devices.
  > 1st Boot Device             [HDD:PM-IEI Techno1]



                                              ←→   Select Screen
                                              ↑ ↓  Select Item
                                              Enter Go to SubScreen
                                              F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit

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```

BIOS Menu 13: Boot Device Priority Settings

5.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. Only installed hard drives are shown.

```
                    BIOS SETUP UTILITY
   Main    Advanced    PCIPNP    Boot    Security   Chipset     Exit

 Hard Disk Drives                                   Specifies the boot
─────────────────────────────────────────          sequence from the
 > 1st Drive                  [HDD:PM-IEI Techno1]   available devices.



                                                    ←→   Select Screen
                                                    ↑ ↓  Select Item
                                                    Enter Go to SubScreen
                                                    F1   General Help
                                                    F10  Save and Exit
                                                    ESC  Exit

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```

BIOS Menu 14: Hard Disk Drives

5.6 Security

Use the **Security** menu (**BIOS Menu 15**) to set system and user passwords.

```
                    BIOS SETUP UTILITY
   Main    Advanced    PCIPNP    Boot    Security   Chipset     Exit

 Security Settings
─────────────────────────────────────────
 Supervisor Password    :Not Installed
 User Password          :Not Installed

 Change Supervisor Password
 Change User Password
                                                    ←→   Select Screen
                                                    ↑ ↓  Select Item
                                                    Enter Go to SubScreen
                                                    F1   General Help
                                                    F10  Save and Exit
                                                    ESC  Exit

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```
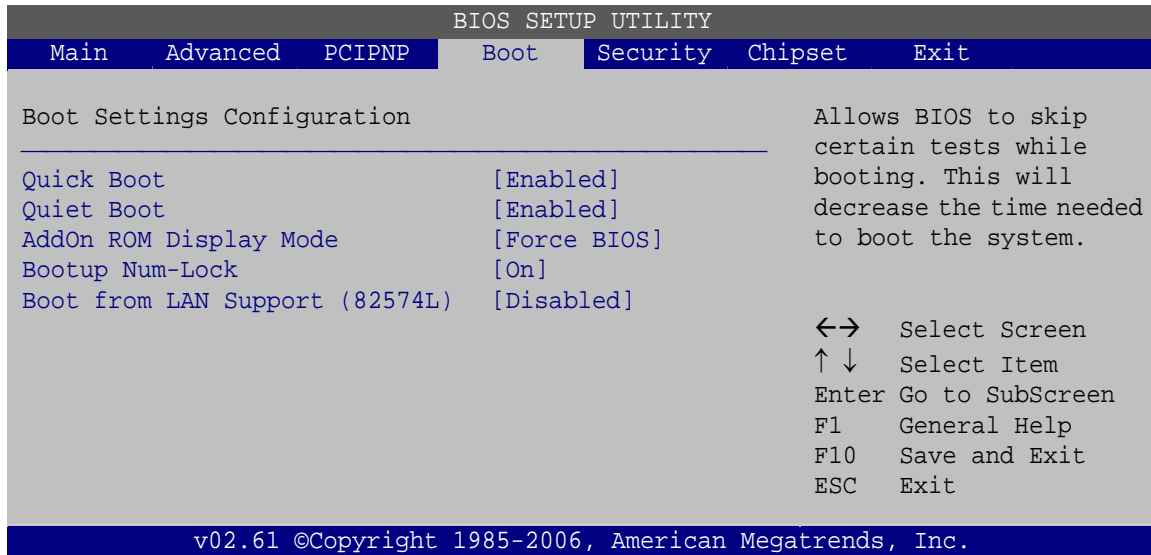
BIOS Menu 15: Security

➔   **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔   **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 16**) to access the Northbridge and Southbridge configuration menus

⚠ **WARNING!**

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

```
                           BIOS SETUP UTILITY
    Main     Advanced    PCIPNP     Boot     Security   Chipset      Exit

Advanced Chipset Settings
_____
WARNING: Setting wrong values in below section
          may cause system to malfunction.

> North Bridge Configuration
> South Bridge Configuration
                                                    ←→    Select Screen
                                                    ↑ ↓   Select Item
                                                    Enter Go to SubScreen
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit

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```
           BIOS Menu 16: Chipset

5.7.1 Northbridge Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 17**) to configure the Northbridge chipset.

```
                           BIOS SETUP UTILITY
    Main     Advanced    PCIPNP     Boot     Security   Chipset      Exit

Northbridge Configuration
_____
Integrated Graphics Mode Select  [Enabled, 4MB]


Boot Display Configuration
_____
Flat Panel Type                 [800x400 24bit]



                                                    ←→    Select Screen
                                                    ↑ ↓   Select Item
                                                    Enter Go to SubScreen
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit
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```
           BIOS Menu 17:Northbridge Chipset Configuration

➔ **Integrated Graphics Mode Select [Enable, 4 MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**

➔ **Enable, 1 MB**   1 MB of memory used by internal graphics device

➔ **Enable, 4 MB**   DEFAULT   4 MB of memory used by internal graphics device

➔ **Enable, 8 MB**   8 MB of memory used by internal graphics device

➔ **Flat Panel Type [800x480 24bit]**

Use the **Flat Panel Type** to determine the LCD panel resolution. Configuration options are listed below:

- 640x480 (generic)
- 800x600 (generic)
- 1024x768 (generic)
- 640x480 (NEC 8.4")
- 800x480 (NEC 9")
- 1024x600 (TMD 5.61")
- 1024x600 (Samsung 4.8")
- 1024x768 (Samsung 15")
- 1280x768 (Sharp 7.2")
- 1280x800 (Samsung 15.4")
- 1024x768 24bit
- 800x480 24bit   **Default**
- 1360x768 24bit Vesa
- 1360x768 18bit
- 1360x768 24bit

5.7.2 Southbridge Configuration

Use the **Southbridge Configuration** menu (**BIOS Menu 18**) to configure the Southbridge chipset.

```
                        BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot    Security  Chipset     Exit

 Southbridge Configuration
 _____

 Audio Controller Codec          [Enabled]
 Spread Spectrum Mode            [Disabled]
 SDIO Controller                 [Enabled]


                                              ←→   Select Screen
                                              ↑ ↓   Select Item
                                              Enter Go to SubScreen
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit

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```
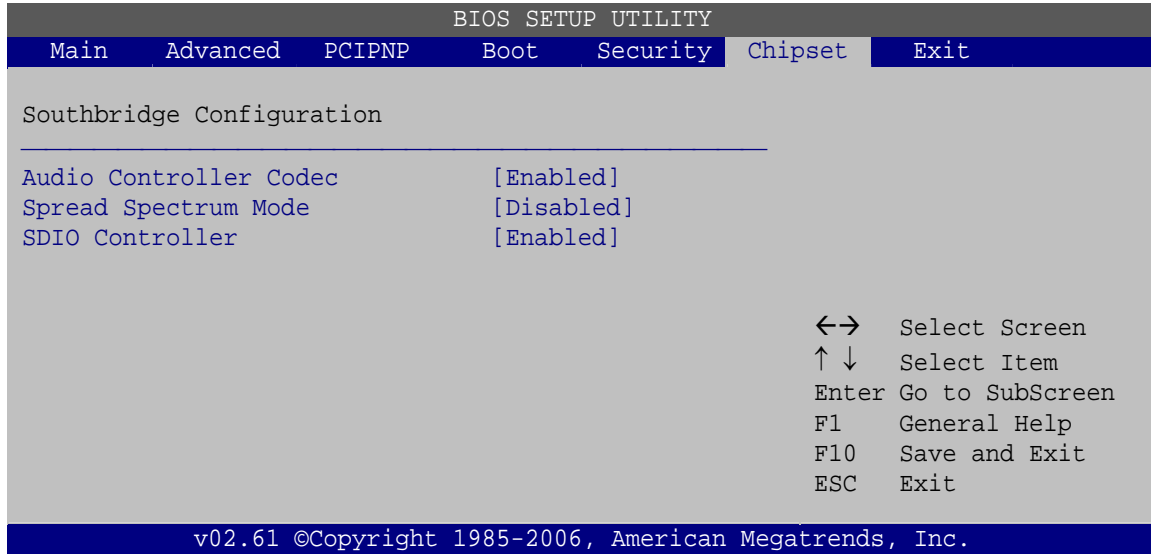
BIOS Menu 18:Southbridge Chipset Configuration

➔ **Audio Controller Codec [Enabled]**

Use the **Audio Controller Codec** option to enable or disable the onboard audio controller.

➔ **Enabled** DEFAULT The onboard audio controller automatically detected and enabled

➔ **Disabled** The onboard audio controller is disabled

➔ **Spread Spectrum [Disabled]**

Use the **Spread Spectrum** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled** DEFAULT EMI not reduced

➔ **Enabled** EMI reduced

5.8 Exit

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

```
                          BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 Exit Options                                    Exit system setup after
 _____  saving the changes.

 Save Changes and Exit
 Discard Changes and Exit                        F10 key can be used for
 Discard Changes                                 this operation

 Load Optimal Defaults
 Load Failsafe Defaults                          ←→   Select Screen
                                                 ↑ ↓   Select Item
                                                 Enter Go to SubScreen
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit

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```

BIOS Menu 19:Exit

➔ **Save Changes and Exit**

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

➔ **Discard Changes and Exit**

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

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix

A

OBD-II Reader Command

A.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	0x31																		
Enter RUN Mode	0x30																			

A.2 Boot Mode

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

A.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	0x0A	0x0D														
Enter CAN Standard V2.2.B	$	M	B	0x0A	0x0D														
Request mode & version	$	M	R	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
Select a mode to send	$	M	0	0x00	Ver (1) 0x10	Ver (2) 0x06	0x0A	0x0D											
Tele mode response	$	M	1	0x00	Ver (1) 0x10	Ver (2) 0x06	0x0A	0x0D											
CAN S mode response	$	M	2	0x00	Ver (1) 0x10	Ver (2) 0x06	0x0A	0x0D											
Enter Tele mode to respond	$	M	T	0x0A	0x0D														
Enter CAN S mode to respond	$	M	C	0x0A	0x0D														

A.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 F1I D(1)	M1F 1ID(2)	M1 F1I D(3)	M1F 1ID(4)	M1 F2I D(1)	M1F 2ID(2)	M1F 2ID(3)	M1 F2I D(4)	M2I D(1)	M2I D(2)	M2I D(3)	M2I D(4)
	M2 F1I D(1)	M2F 1ID(2)	M2 F1I D(3)	M2F1ID(4)	M2F2ID(1)	M2F 2ID(2)	M2F 2ID(3)	M2 F2I D(4)	M3F 3ID(1)	M3 F3I D(2)	M3F 3ID(3)	M3 F3I D(4)	M3F 4ID(1)	M3F 4ID(2)	M3 F4I D(3)	M3F 4ID(4)	RxI 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 complete	$	C	4	0x0A	0x0D														
Read query setup	$	C	5	xxx Baud	TxID E RTR B0 B1 DLC	ID(1)	ID(2)	ID(3)	ID(4)	D1	D2	D3	D4	D5	D6	D7	D8	0x0A	0x0D
Read menu setup	$	C	7	M1I D(1)	M1I D(2)	M1I D(3)	M1I D(4)	M1F 1ID(1)	M1F 1ID(2)	M1F 1ID(3)	M1F 1ID(4)	M1F 2ID(1)	M1F 2ID(2)	M1F 2ID(3)	M1F 2ID(4)	M2I D(1)	M2I D(2)	M2I D(3)	M2I D(4)
	M2F 1ID(1)	M2F 1ID(2)	M2F 1ID(3)	M2F 1ID(4)	M2F 2ID(1)	M2F 2ID(2)	M2F 2ID(3)	M2F 2ID(4)	M3F 3ID(1)	M3F 3ID(2)	M3F 3ID(3)	M3F 3ID(4)	M3F 4ID(1)	M3F 4ID(2)	M3F 4ID(3)	M3F 4ID(4)	RxID E xxx xxxx	0x0A	0x0D	
Read CAN complete	$	C	6	xxx Baud	IDE RTR B0 B1 DLC	ID(1)	ID(2)	ID(3)	ID(4)	D1	D2	D3	D4	D5	D6	D7	D8	0x0A	0x0D
CAN starts query	$	C	8	0x0A	0x0D														
CAN query error	$	C	E	0x0A	0x0D														
CAN query succeed	$	C	F	0x0A	0x0D														

A.5 Into Telematics (Vehicel 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 PSPF	I	P -1	P -2	P -1	P -2	0x0 D												
FMS input PSPF	J	P -1	P -2	P -1	P -2	0x0 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																			

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 064100BE1B301300
      Byte1 is 06 followed by six non-zero values.
2. 18DAF110 08 0341043200000000
      Byte1 is 03 followed by three non-zero values.
Byte 2: Mode is related with the Key-in value. For example:
      0104 18DAF110 08 0341043200000000
      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 0341043200000000
      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

B

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 B-1: AH-6FH Sub-function

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

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

⚠ **NOTE:**

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

C

Hazardous Materials Disclosure

C.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	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

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

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	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/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。						