IEI Technology Corp.

MODEL:

IDS-H61

Fanless Digital Signage Player with Intel® Celeron® G530T Dual-Core CPU, Intel® H61 Express Chipset, GbE LAN, DisplayPort, DVI, RS-232, USB 2.0, SDHC Slot, RoHS Compliant

User Manual

Rev. 1.00 – 7 February, 2013

RoHS Lead Free

Revision

Date	Version	Changes
7 February, 2013	1.00	Initial release

Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

WARNING

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.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/ TV technician for help.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

IMPORTANT NOTE:

FCC 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.

Table of Contents

List of Figures

List of Tables

List of BIOS Menus

Chapter

1

Introduction

1.1 Overview

Figure 1-1: IDS-H61 Series Pluggable Module PC

The IDS-H61 series is a fanless digital signage player with Intel® Celeron® dual-core G530T processor and Intel® H61 Express Chipset. The IDS-H61 is preinstalled 4 GB of DDR3 SO-DIMM and can accommodate up to 16 GB of DDR3 memory. Storage in the system is handled by the preinstalled 32 GB mSATA module, the 2.5" SATA HDD bay and the SDHC card slot on the front panel.

The IDS-H61 includes a DisplayPort output interface supporting up to 2560 x 1600 resolutions and a DVI-I connector supporting up to 1920 x 1200 resolutions. Other slots and connectors include half-size and full-size PCIe Mini card slots, RS-232, Gigabit Ethernet, USB 2.0 ports and audio out.

1.2 Features

The IDS-H61 has the following features

- Fanless design
- LGA1155 2.0 GHz Intel® Celeron® G530T CPU supported
- Intel® HD Graphics with full HD video decoding capability
- One 32 GB mSATA module preinstalled
- One 2.5" SATA HDD bay
- One SDHC card supported
- One GbE LAN for high speed network applications

- One DisplayPort connector

- One DVI-I connector

- Four USB 2.0 ports

- One RS-232 DB-9 serial port

- One audio line-out jack

- RoHS compliant design

1.3 Front Panel

The front panel of the IDS-H61 contains one SDHC slot, two USB 2.0 ports, LED indicators and a power button. The LED indicators are listed below. An overview of the front panel is shown in **Figure 1-2**.

- 1 x Storage device (SD card/HDD) LED indicator
- 1 x USB LED indicator
- 1 x LAN LED indicator
- 1 x Status LED indicator (Blinking: booting; Solid: complete booting)
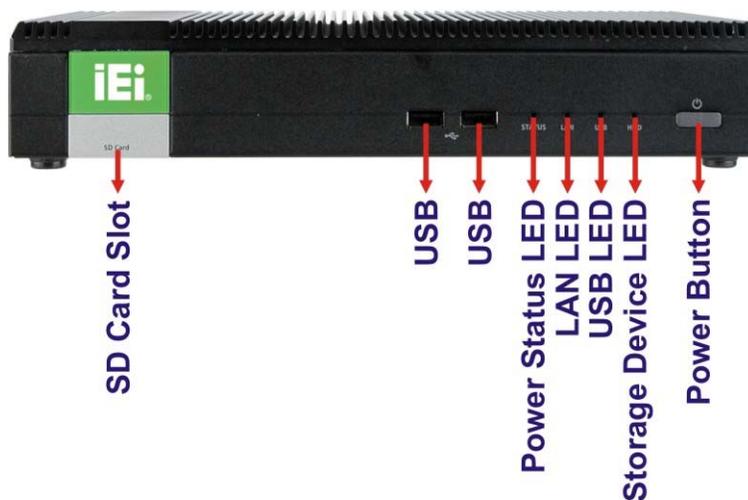
Figure 1-2: Front Panel

1.4 Rear Panel

The IDS-H61 rear panel provides access to the following external I/O connectors:

- 1 x 12 V DC input jack

- 1 x Audio line-out jack
- 1 x DisplayPort connector
- 1 x GbE RJ-45 connector
- 1 x RS-232 DB-9 serial port
- 2 x USB 2.0 port connectors
- 1 x DVI-I connector
- 1 x Reset button

An overview of the rear panel is shown in **Figure 1-3** below.
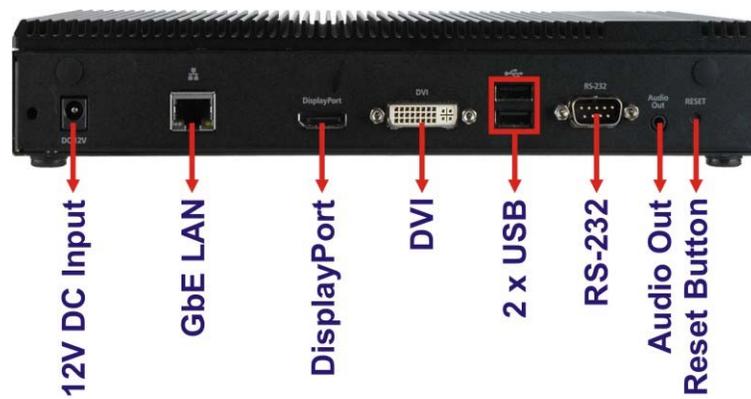
Figure 1-3: Rear Panel

1.5 Bottom Panel

The bottom panel of the IDS-H61 contains several screw holes for VESA mount.
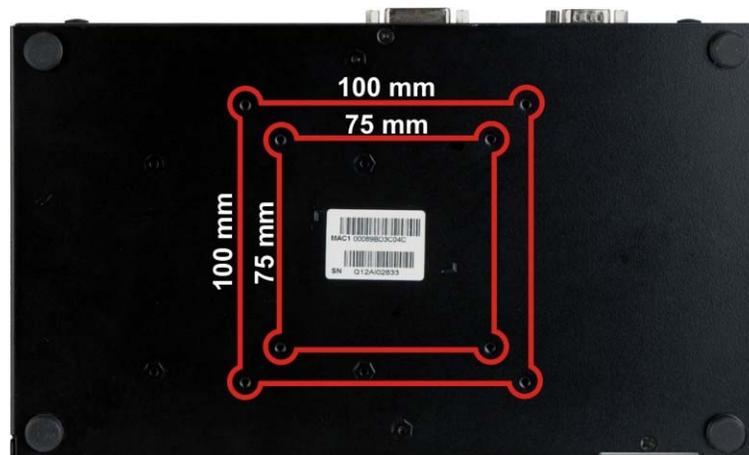
Figure 1-4: Bottom Panel

1.6 Technical Specifications

The specifications for the IDS-H61 are listed below.

	IDS-H61-C-4GB
CPU	2.0GHz Intel® Celeron® G530T dual-core CPU (2M cache)
System Chipset	Intel® H61 Express Chipset
System Memory	Two 1333 MHz 2 GB DDR3 SDRAM SO-DIMM preinstalled (system max. 16 GB)
Graphics	Intel® HD Graphics
Max. Output Resolution	DVI-I: 1920 x 1200 DisplayPort: 2560 x 1600
Ethernet	One Intel® 82579LM GbE controller
Display	One DVI-I connector One DisplayPort 1.1 connector
Serial Port	One RS-232 DB-9 serial port
USB	Four USB 2.0 ports
Audio	One audio out (5.1 channel Realtek ALC662 HD Audio codec)
Storage	One 32 GB mSATA module preinstalled One 2.5" SATA HDD bay One SDHC card slot on the front panel
Expansion Slot	Two PCIe Mini full-size slots (one preinstalled with a 32 GB mSATA module) One PCIe Mini half-size slot (reserved for Wi-Fi module)
Wireless	Optional 802.11b/g/n Wi-Fi
Buttons	One power button One reset button

Chassis Construction	Aluminum Alloy (top cover) with heavy duty metal
Mounting	VESA 75 mm or 100 mm
Power Input	12V DC
Power Consumption	41 W @ full loading
Operating Temperature	0ºC ~ 45ºC with air flow
Storage Temperature	-10 ºC ~ 55ºC
Color	Black
Weight (Net/Gross)	2.1kg/4.5kg
Dimensions (W x D x H)	267 mm x 160 mm x 45 mm
Operation Vibration	MIL-STD-810F 514.5C-1 with SATA HDD MIL-STD-810F 514.5C-2 with mSATA
EMC	FCC, CE, LVD
Supported OS	Microsoft Windows 7 or Microsoft Windows Embedded Standard 7

Table 1-1: Technical Specifications

1.7 Dimensions

The physical dimensions of the IDS-H61 embedded systems are shown in **Figure 1-5**.

- **Height**: 45.00 mm
- **Width**: 267.00 mm
- **Length**: 160.00 mm
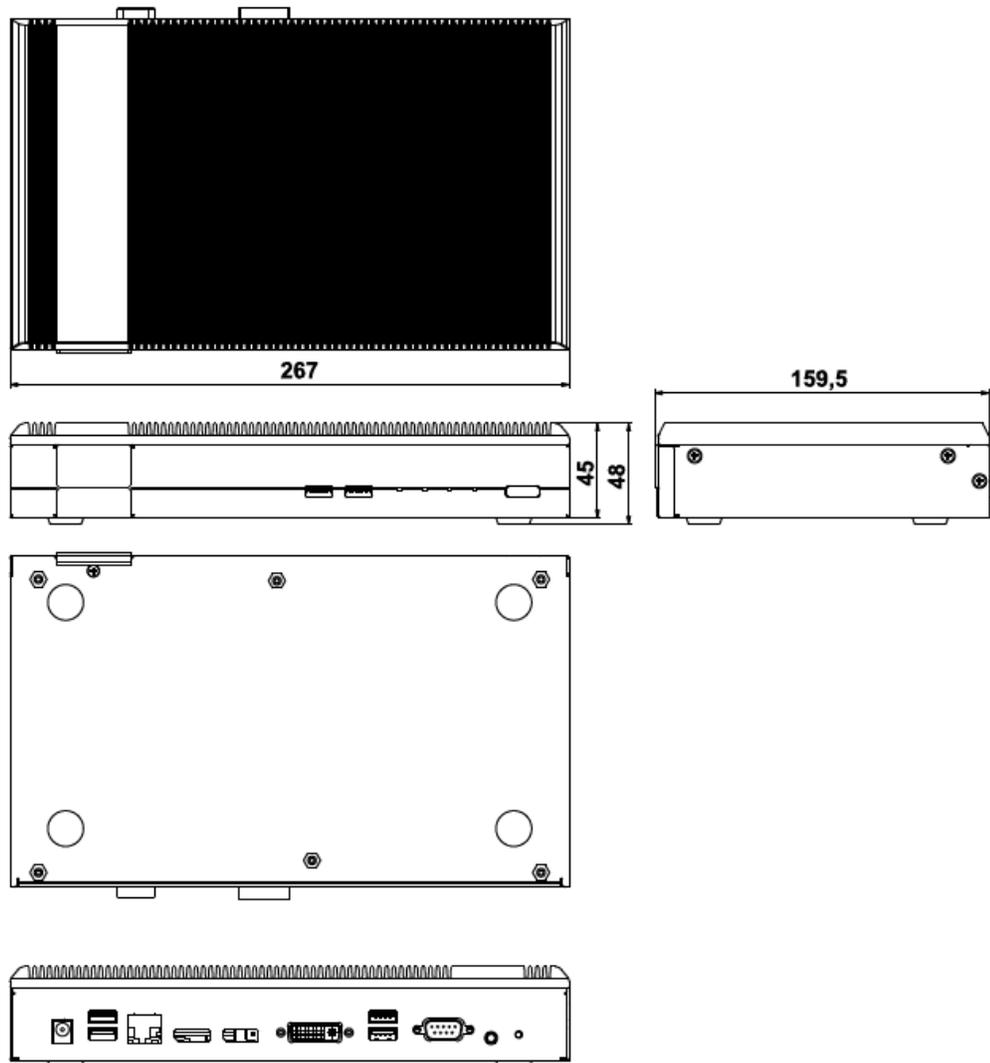
Figure 1-5: IDS-H61 Dimensions (mm)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the IDS-H61 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IDS-H61. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IDS-H61 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 IDS-H61, place it on an antic-static pad. This reduces the possibility of ESD damaging the IDS-H61.

2.2 Unpacking Precautions

When the IDS-H61 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the IDS-H61 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

> ![NOTE icon] **NOTE:**
>
> If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IDS-H61 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The IDS-H61 is shipped with the following components:

Quantity	Item	Image
1	IDS-H61 digital signage player	
1	Power adapter	
1	Wall mount kit	
1	Driver and manual CD	

Table 2-1: Package List Contents

Chapter

3

Installation

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the IDS-H61, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the IDS-H61 must be disconnected during the installation process, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the IDS-H61 is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The IDS-H61 must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the IDS-H61. The IDS-H61's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the IDS-H61. Leave at least 5 cm of clearance around the IDS-H61 to prevent overheating.
- **Grounding**: The IDS-H61 should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the IDS-H61.

3.1.1 High Surface Temperature

⚠️ **WARNING:**

Some surfaces of the equipment may become hot during operation.

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

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

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

3.2 SD Card Installation

The IDS-H61 series has a SDHC card slot on the front panel. To install the SDHC card into the system, please follow the steps below.

Step 1: Locate the SDHC card slot on the front panel. Remove the SDHC slot cover retention screw on the bottom panel (**Figure 3-1**).

Figure 3-1: SDHC Slot Cover Retention Screw

Step 2: Open the slot cover and insert a SDHC card into the slot. (**Figure 3-2**)

Figure 3-2: SDHC Card Installation

Step 3: Secure the SDHC card with the slot cover by fastening the previously removed retention screw.

3.3 HDD Installation

The IDS-H61 has a 2.5" HDD bay inside the top cover. To install to an HDD, follow the steps below.

Step 1: Remove the top cover by removing the four retention screws on both side panels (two on each side). See **Figure 3-3**.

Figure 3-3: Top Cover Retention Screws

Step 2: Locate the HDD bracket inside the top cover. Remove the four HDD bracket retention screws and lift the HDD bracket.

Figure 3-4: HDD Bracket Retention Screws

Step 3: Insert an HDD into the bracket and secure the HDD to the bracket using four retention screws (two screws on each side). See **Figure 3-5**.

Figure 3-5: Inserting the HDD

Step 4: Connect a SATA cable to the HDD. Secure the SATA cable with the HDD by fastening two screws. See **Figure 3-6**.

Figure 3-6: SATA Cable Connection

Step 5: Install the HDD bracket in the same position it was before.
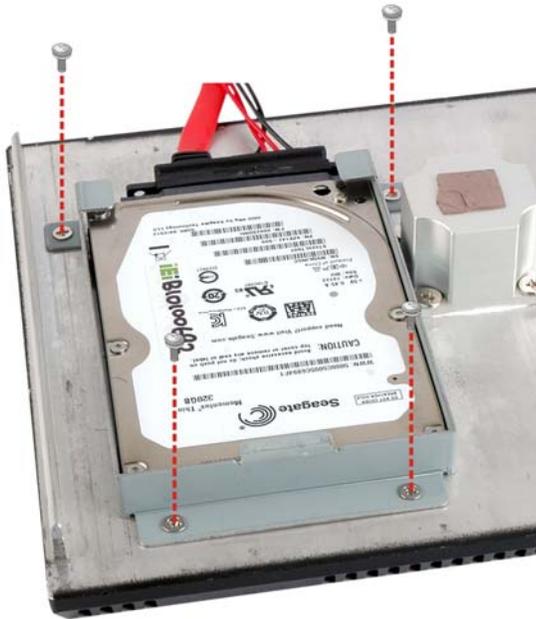
Figure 3-7: Installing the HDD

Step 6: Connect the SATA cable to the SATA connector and SATA power connector on the motherboard.

Step 7: Reinstall the top cover.

3.4 Mounting the System

To mount the IDS-H61 onto a wall, please follow the steps below.

Step 1: Select the location on the wall for mounting the IDS-H61.

Step 2: Carefully mark the locations of the four mounting screw holes on the wall. Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 3: Align the wall-mounting screw holes of the mounting bracket with the pilot holes. Secure the mounting bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 3-8**).
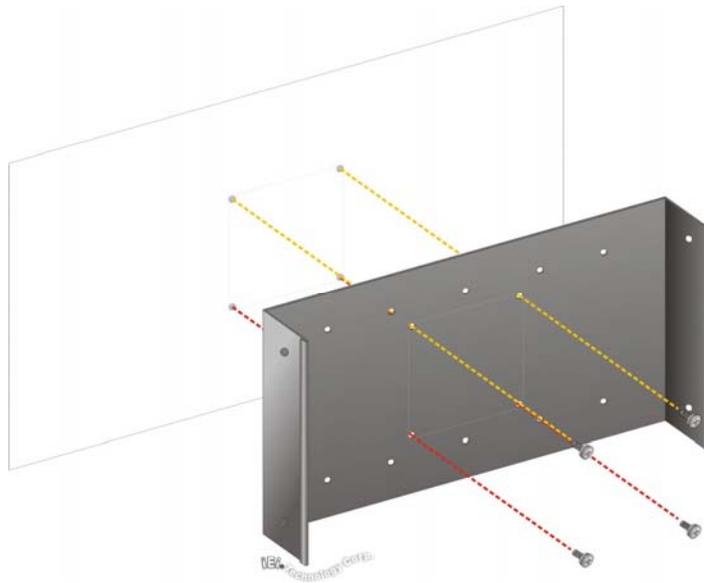
Figure 3-8: Installing the Mounting Bracket

Step 4: Place the IDS-H61 onto the mounting bracket and align the retention screw

holes on both sides of the system with the screw holes on the mounting bracket

(**Figure 3-9**).
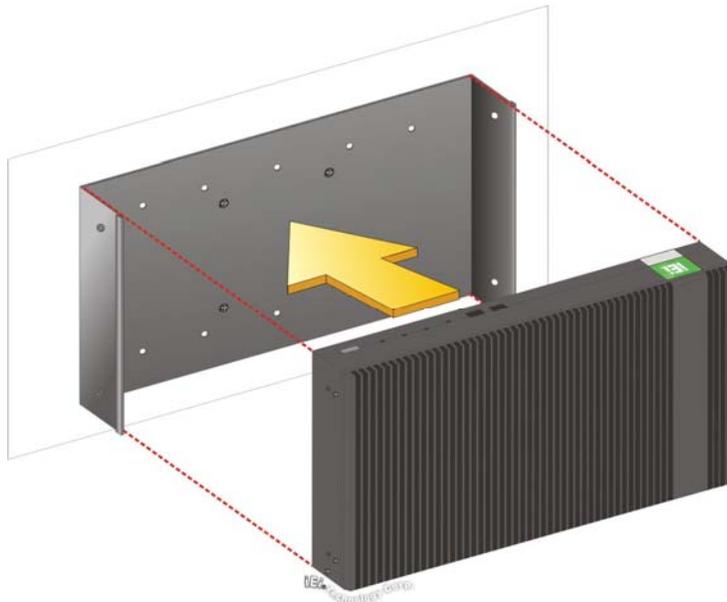
Figure 3-9: Pace the System onto the Mounting Bracket

Step 5: Secure the IDS-H61 to the mounting bracket with four M4 retention screws (**Figure 3-10**).
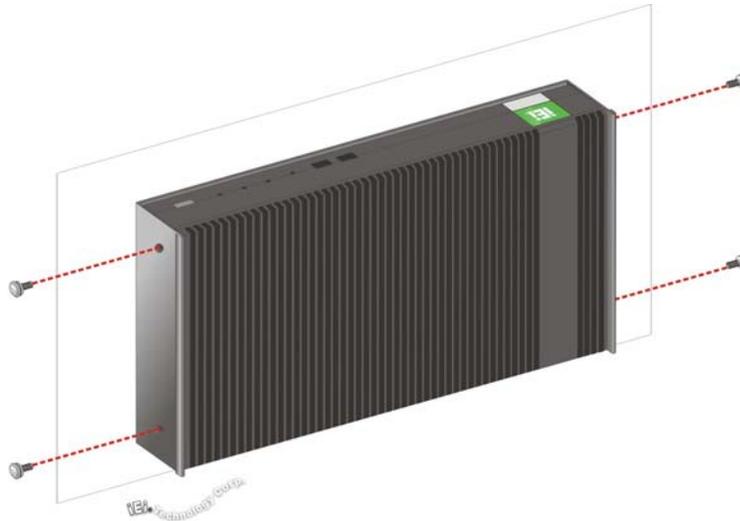
Figure 3-10: Mounting the System

![NOTE icon] **NOTE:**

The IDS-H61 can also be mounted on a VESA 75mm/100mm complaint mounting device. Use the mounting bracket and follow the instruction described above (**Step 3 ~ Step 5**) to mount the system onto a VESA mount device.

3.5 External Peripheral Interface Connection

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

- Audio devices
- RJ-45 Ethernet cable connectors
- DisplayPort, DVI or VGA monitors
- Serial port devices

▪   USB devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding IDS-H61 external peripheral interface connector making sure the pins are properly aligned.

3.5.1 Audio Line-out Connector

CN Label: **Audio out**

CN Type: Audio jack

The audio line-out jack connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.

3.5.2 DisplayPort Connector

CN Label: **DisplayPort**

CN Type: DisplayPort 1.1

The DisplayPort connector transmits a digital signal to compatible DisplayPort display devices such as a TV or computer screen.

3.5.3 LAN Connector

CN Label: **LAN**

CN Type: RJ-45

CN Pinouts: See **Table 3-1**

The LAN connector allows connection to an external network.

Pin	Description	Pin	Description
1	TRD1P0	5	TRD1P2
2	TRD1N0	6	TRD1N2
3	TRD1P1	7	TRD1P3
4	TRD1N1	8	TRD1N3

Table 3-1: LAN Pinouts
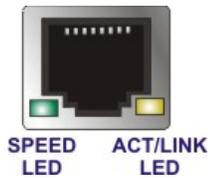
Figure 3-11: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-2**.

Activity/Link LED		Speed LED	
STATUS	DESCRIPTION	STATUS	DESCRIPTION
Off	No link	Off	10 Mbps connection
Yellow	Linked	Green	100 Mbps connection
Blinking	TX/RX activity	Orange	1 Gbps connection

Table 3-2: RJ-45 Ethernet Connector LEDs

3.5.4 DVI-I Connector

CN Label: DVI

CN Type: DVI-I connector

CN Pinouts: See **Table 3-3**

The 24-pin Digital Visual Interface (DVI) connector connects to high-speed, high-resolution digital displays. The DVI-I connector supports both digital and analog signals.

Pin	Description	Pin	Description	Pin	Description
1	TMDS Data2-	9	TMDS Data1-	17	TMDS Data0-
2	TMDS Data2+	10	TMDS Data1+	18	TMDS Data0+
3	GND	11	GND	19	GND
4	N/C	12	NC	20	NC
5	N/C	13	NC	21	NC
6	DDC Clock [SCL]	14	PVDD1	22	GND
7	DDC Data [SDA]	15	GND	23	TMDS Clock +

Pin	Description	Pin	Description	Pin	Description
8	Analog vertical sync	16	GND	24	TMDS Clock -
C1	Analog Red	--	--	--	--
C2	Analog Green	--	--	--	--
C3	Analog Blue	--	--	--	--
C4	Analog Horizontal Sync	--	--	--	--
C5	Analog GND	--	--	--	--

Table 3-3: DVI Connector Pinouts
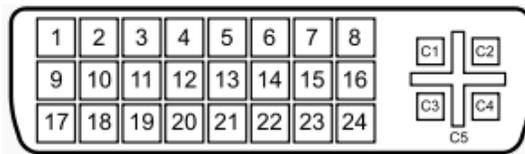
Figure 3-12: DVI-I Connector

3.5.5 Power Connector (12 V, Power Adapter)

CN Label:　　　**DC 12V**

CN Type:　　　DC jack

The connector supports the 12V power adapter.

Figure 3-13: Power Jack Connector

3.5.6 RS-232 Serial Port Connector

CN Label:　　　**RS-232**

CN Type:　　　Male DB-9

CN Pinouts:　　See **Table 3-4**

The RS-232 serial port connector allows connection to a serial device.

Pin	Description	Pin	Description
1	DCD	6	CTS
2	DSR	7	DT
3	SIN	8	RI
4	RTS	9	GND
5	SOUT	10	GND

Table 3-4: Serial Port Pinouts
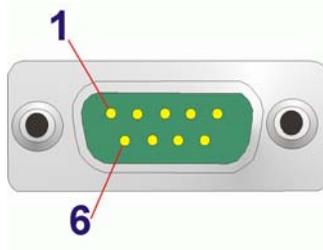
Figure 3-14: Serial Port Pinouts

3.5.7 USB 2.0 Connectors

CN Label: **USB**

CN Type: USB 2.0 port

CN Pinouts: See **Table 3-5**

The USB ports are for connecting USB peripheral devices to the system.

Pin	Description	Pin	Description
1	VCC	5	VCC
2	DATA-	6	DATA-
3	DATA+	7	DATA+
4	GROUND	8	GROUND

Table 3-5: USB Port Pinouts

3.6 Driver Installation

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.

The following drivers can be installed on the system:

- Intel AHCI
- Intel chipset
- Intel Ethernet
- Intel® HD Graphics
- Intel® MEI
- Realtek HD Audio

Double click the setup file in each driver folder and follow the step-by-step instruction of the installation wizard to install the drivers listed above.

Chapter

4

BIOS Screens

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.

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
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

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

Table 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** or the **F1** key again.

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.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings

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

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) 2012 American Megatrends, Inc.
     Main    Advanced   Chipset     Boot    Security  Save & Exit

  BIOS Information                                        Set the Date. Use Tab to
  BIOS Vendor                     American Megatrends     switch between Data
  Core Version                    4.6.5.3                 elements.
  Compliency                      UEFI 2.3; PI 1.2
  Project Version                 QC24AR06  x64
  Build Date                      09/06/2012 11:48:35     ---------------------

  Memory Information                                      ←→: Select Screen
  Total Memory                    4096 MB (DDR3)          ↑ ↓: Select Item
  Memory Frequency                1067 Mhz                Enter Select
                                                          + -   Change Opt.
  System Date                     [Tue 11/27/2011]        F1   General Help
  System Time                     [15:10:27]              F2   Previous Values
                                                          F3   Optimized Defaults
  Access Level                    Administrator           F4   Save & Exit
                                                          ESC  Exit
          Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```

   BIOS Menu 1: Main

➔ **System Overview**

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

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

➔ **Memory Information**

The **Memory Information** lists a brief summary of the on-board memory. The fields in **Memory Information** cannot be changed.

- Total Memory: Displays the auto-detected system memory size and type.

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

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

➔ **System Time [xx:xx:xx]**

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

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) 2012 American Megatrends, Inc.
  Main    Advanced   Chipset    Boot    Security  Save & Exit

> CPU Configuration                                CPU Configuration
> USB Configuration                                Parameters
> H/M Monitor

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

                                                   ←→: Select Screen
                                                   ↑↓: Select Item
                                                   Enter Select
                                                   + -   Change Opt.
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3   Optimized Defaults
                                                   F4   Save & Exit
                                                   ESC  Exit
      Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

4.3.1 CPU Configuration

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

```
       Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
          Advanced

 CPU Configuration                                      When enabled, a VMM can
                                                        utilize the additional
 Intel(R) Celeron(R) CPU G530T @ 2.00GHz                hardware capabilities
 CPU Signature                    206a7                 provided by Vanderpool
 Microcode Patch                  26                    Technology
 Max CPU Speed                    2000 MHz
 Min CPU Speed                    1600 MHz
 CPU Speed                        2000 MHz              ---------------------
 Processor Cores                  2
 Intel HT Technology              Not Supported         ←→: Select Screen
 Intel VT-x Technology            Supported             ↑ ↓: Select Item
 Intel SMX Technology             Not Supported         Enter Select
 64-bit                           Supported             + -   Change Opt.
                                                        F1    General Help
 L1 Data Cache                    32 kB x 2             F2    Previous Values
 L1 Code Cache                    32 kB x 2             F3    Optimized Defaults
 L2 Cache                         256 kB x 2            F4    Save & Exit
 L3 Cache                         2048 kB               ESC   Exit


 Intel Virtualization Technology   [Disabled]

       Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 3: CPU Configuration

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

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- CPU Speed: Lists the CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.

- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

➔ **Intel Virtualization Technology [Disabled]**

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled**   DEFAULT   Disables Intel Virtualization Technology.

➔ **Enabled**   Enables Intel Virtualization Technology.

4.3.2 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 4**) to read USB configuration information and configure the USB settings.

```
          Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
          Advanced

USB Configuration                                        Enables Legacy USB
                                                         support. AUTO option
USB Devices:                                             disables legacy support
        1 Keyboard, 2 Hubs                               if no USB devices are
                                                         connected. DISABLE
Legacy USB Support                  [Enabled]            option will keep USB
                                                         devices available only
                                                         for EFI applications.

                                                         ---------------------
                                                         ←→: Select Screen
                                                         ↑↓: Select Item
                                                         Enter Select
                                                         + -  Change Opt.
                                                         F1   General Help
                                                         F2   Previous Values
                                                         F3   Optimized Defaults
                                                         F4   Save & Exit
                                                         ESC  Exit
          Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```

   BIOS Menu 4: USB Configuration

➔ **USB Devices**

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

➔ **Legacy USB Support [Enabled]**

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

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

➔ **Disabled** Legacy USB support disabled

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

4.3.3 H/W Monitor

The H/W Monitor menu (**BIOS Menu 5**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
            Advanced

 PC Health Status                                   Smart Fan Mode Select

 Smart Fan Function            [Enable]

 CPU Temperature               :+30 C
                                                    --------------------
 CPU FAN Speed                 :N/A                 ←→: Select Screen
                                                    ↑ ↓: Select Item
 V_CORE                        : +1.072 V           EnterSelect
 V_3.3                         : +3.392 V           + -   Change Opt.
 +1.05V                        : +1.064 V           F1   General Help
 Vcc1_5VDDR                    : +1.600 V           F2   Previous Values
 5VSB                          : +4.944 V           F3   Optimized Defaults
 VCC3V                         : +3.376 V           F4   Save & Exit
 VSB3                          : +3.408 V           ESC  Exit
 VBAT                          : +2.992 V

         Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 5: H/W Monitor

➔ **Smart Fan Function [Enable]**

Use the **Smart Fan Function** option to disable or enable the Smart Fan.

➔ **Disable** The smart fan is disabled.

➔ **Enable** DEFAULT The smart fan is enabled.

➔ **H/W Monitor**

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

- ▪ CPU Temperature

- ▪ CPU Fan Speed

- ▪ Voltages:

  - ○ V_CORE

  - ○ V_3.3

  - ○ +1.05V

  - ○ Vcc1_5VDDR

  - ○ 5VSB

  - ○ VCC3V

  - ○ VSB3

  - ○ VBAT

4.4 Chipset

Use the Chipset menu (**BIOS Menu 6**) to configure the system chipset.

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Main     Advanced   Chipset    Boot    Security  Save & Exit

 DVMT Pre-Allocated               [64M]              IGD Share Memory Size
 DVMT Total Gfx Mem               [256M]
 SATA Mode Selection              [AHCI]
 Restore AC Power Loss            [Last State]       ---------------------
                                                     ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     Enter Select
                                                     + -   Change Opt.
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit

         Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```

   BIOS Menu 6: Chipset

➔ **DVMT Pre-Allocated [64M]**

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M
- 64M   **Default**
- 128M
- 160M
- 192M
- 224M
- 256M
- 288M
- 320M
- 352M
- 384M
- 416M
- 448M
- 480M
- 512M
- 1024M

➔ **DVMT Total Gfx Mem [256M]**

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M   **DEFAULT**
- MAX

➔ **SATA Mode Selection [IDE Mode]**

Use the **SATA Mode Selection** option to configure SATA devices as normal IDE devices.

➔ **IDE**   Configures SATA devices as normal IDE device.

➔ **AHCI**   **DEFAULT**   Configures SATA devices as AHCI device.

➔ **RAID**   Configures SATA devices as RAID device.

➔ **Restore on AC Power Loss [Last State]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** The system remains turned off

➔ **Power On** The system turns on

➔ **Last State** DEFAULT The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

4.5 Boot

Use the **Boot** menu (**BIOS Menu 7**) to configure system boot options.

```
        Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
   Main    Advanced   Chipset     Boot     Security  Save & Exit

 Boot Configuration                                     Select the keyboard
 Bootup NumLock State          [On]                     NumLock state
 Quiet Boot                    [Disabled]

 Boot Option Priorities                                 ---------------------
 Boot Option #1                [P1: EverGreen mSATA…]   ←→: Select Screen
 Boot Option #2                [Disabled]               ↑ ↓: Select Item
                                                        Enter Select
                                                        + -   Change Opt.
                                                        F1    General Help
                                                        F2    Previous Values
                                                        F3    Optimized Defaults
                                                        F4    Save & Exit
                                                        ESC   Exit
        Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 7: 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**   D**EFAULT**   Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off**   Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **Quiet Boot [Disabled]**

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

➔ **Disabled**   D**EFAULT**   Normal POST messages displayed

➔ **Enabled**   OEM Logo displayed instead of POST messages

4.6 Security

Use the **Security** menu (**BIOS Menu 8**) to set system and user passwords.

```
         Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
    Main    Advanced   Chipset    Boot    Security  Save & Exit

 Password Description                            Set Setup Administrator
                                                 Password
 If ONLY the Administrator's password is set,
 then this only limits access to Setup and is
 only asked for when entering Setup.            --------------------
 If ONLY the User's password is set, then this
 is a power on password and must be entered to  ←→: Select Screen
 boot or enter Setup. In Setup the User will    ↑ ↓: Select Item
 have Administrator rights.                     Enter Select
 The password must be 3 to 20 characters long.  + -  Change Opt.
                                                F1   General Help
                                                F2   Previous Values
 Administrator Password                         F3   Optimized Defaults
 User Password                                  F4   Save & Exit
                                                ESC  Exit
         Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```

   BIOS Menu 8: 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.

4.7 Exit

Use the **Exit** menu (**BIOS Menu 9**) to load default BIOS values, optimal failsafe values
and to save configuration changes.

```
     Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Main    Advanced   Chipset     Boot     Security  Save & Exit

 Save Changes and Reset                              Reset the system after
 Discard Changes and Reset                           saving the changes.

 Restore Defaults
 Save as User Defaults
 Restore User Defaults

                                                     --------------------
                                                     ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     Enter Select
                                                     + -   Change Opt.
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit
        Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
```

   BIOS Menu 9: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.

➔ **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

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 2.1**.

5.1 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 IDS-H61, 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.

5.2 Component Replacement Procedure

WARNING!

Users are not advised to attempt to repair or replace any internal or external components of the IDS-H61 embedded system other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the IDS-H61 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

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

- SO-DIMM module
- mSATA module (see **Section 5.2.1**)

5.2.1 mSATA Replacement

The IDS-H61 is preinstalled with one mSATA module. To replace the mSATA module, please refer to the diagram and instructions below.

Step 1: Remove the top cover by removing the four retention screws on both side panels (two on each side). See **Figure 5-1**.

Figure 5-1: System Cover Retention Screws

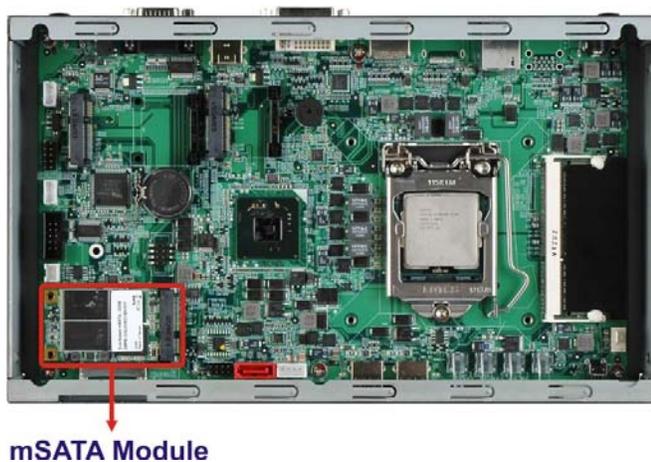**Step 2:** Locate the mSATA module installed on the motherboard (**Figure 5-2**).

Figure 5-2: mSATA Module Location

Step 3: **Remove the mSATA module**. Push the two spring clips in to release the

mSATA module.

Step 4: **Insert a new mSATA module into the socket at an angle**. Line up the notch

on the card with the notch on the connector. Slide the mSATA module into the

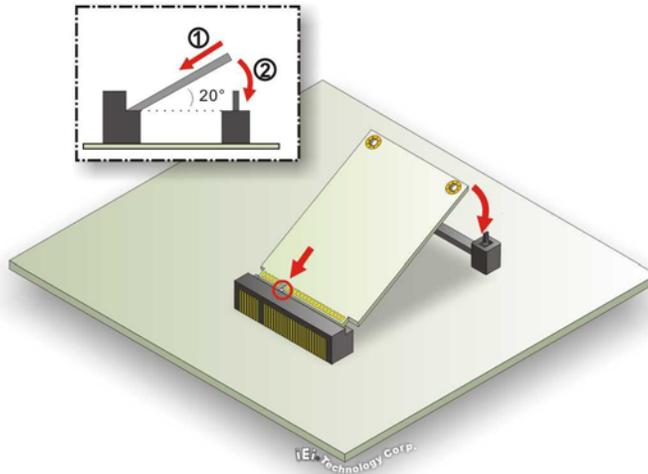socket at an angle of about 20º (**Figure 5-3**).

Figure 5-3: mSATA Module Installation

Step 5: **Push down until the card clips into place**. Push the other end of the card

down until it clips into place on the plastic connector.

5.2.2 SO-DIMM Replacement

> ⚠️ **WARNING:**
>
> Using incorrectly specified SO-DIMM may cause permanently damage
> the IDS-H61. Please make sure the purchased SO-DIMM complies
> with the memory specifications of the IDS-H61.

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

below.

Step 1: Remove the top cover by removing the four retention screws on both side panels (two on each side). See **Figure 5-1**.

Step 2: Locate the SO-DIMM. (**Figure 5-4**).

SO-DIMM

Figure 5-4: SO-DIMM Removal

Step 3: Remove the SO-DIMM by releasing the arms on the SO-DIMM socket. Align the new SO-DIMM with the socket. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket (**Figure 5-5**).

Step 4: Insert the SO-DIMM. Push the SO-DIMM chip into the socket at an angle (**Figure 5-5**).
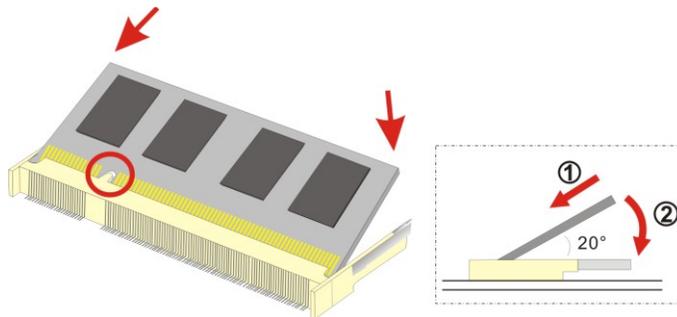

① ② 20°

Figure 5-5: SO-DIMM Installation

Step 5: **Secure the SO-DIMM**. Press the SO-DIMM down until the arms of the SO-DIMM socket clip into place and secure the SO-DIMM in the socket.

Chapter

6

Interface Connectors

6.1 Peripheral Interface Connectors

The IDS-H61 series' motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 6-1**. The Pin 1 locations of the on-board connectors are also indicated in the diagrams below. The connector pinouts for these connectors are listed in the following sections.
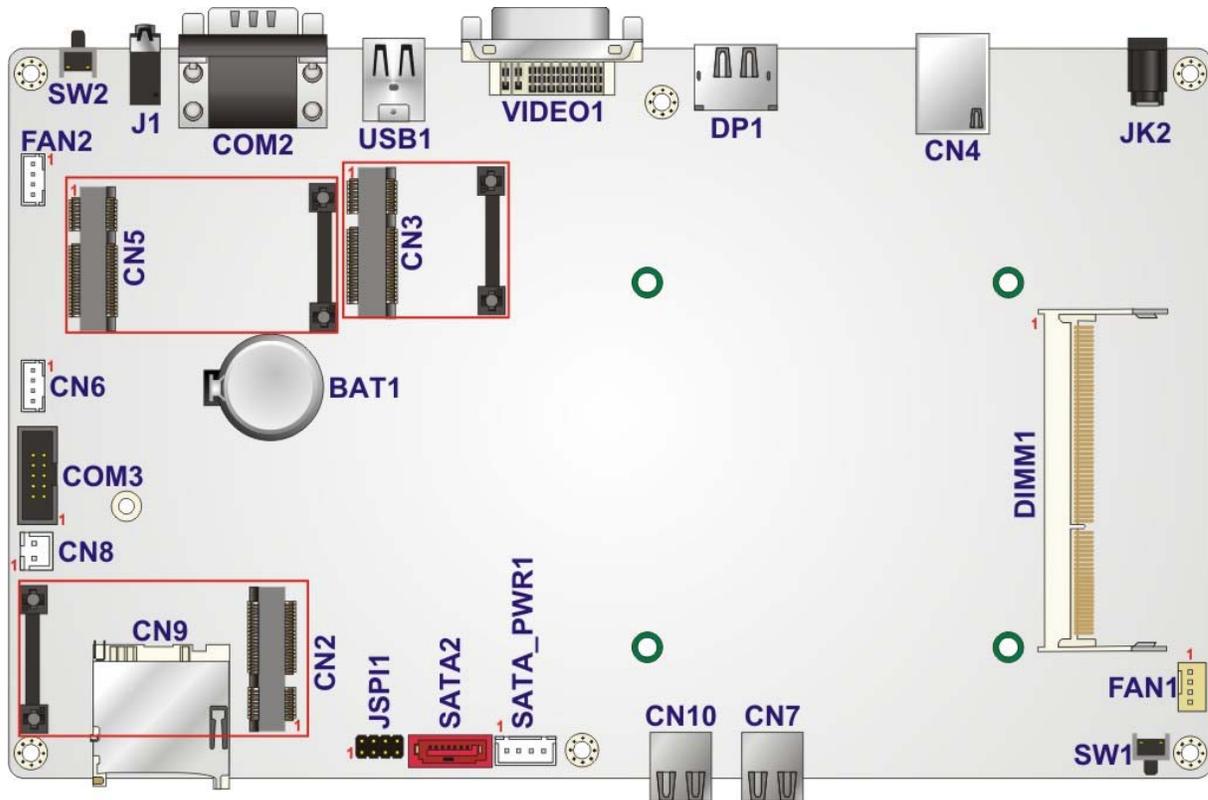

Figure 6-1: Main Board Layout Diagram (Front Side)

6.2 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 IDS-H61 motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Debug connector	4-pin wafer	CN6
Fan connector (1)	4-pin wafer	FAN1
Fan connector (2)	4-pin wafer	FAN2
PCIe Mini card slot	Half-size PCIe Mini card slot	CN3
PCIe Mini card slot	Full-size PCIe Mini card slot	CN5
PCIe Mini card slot (mSATA)	Full-size PCIe Mini card slot	CN2
RS-485 connector	2-pin wafer	CN8
SATA connector	7-pin connector	SATA2
SATA power connector	4-pin wafer	SATA_PWR1
SD card slot	SD card slot	CN9
Serial port for debug	10-pin box header	COM3
SO-DIMM connector	SO-DIMM connector	DIMM1
SPI Flash connector	8-pin header	JSPI1

Table 6-1: Peripheral Interface Connectors

6.2.1 Fan Connector (FAN1)

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FB
4	PWM

Table 6-2: Fan Connector (FAN1) Pinouts

6.2.2 Fan Connector (FAN2)

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FB
4	PWM

Table 6-3: Fan Connector (FAN2) Pinouts

6.2.3 Half-Size PCIe Mini Slot (CN3)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE-WAKE	2	+3.3V
3	N/C	4	GND
5	N/C	6	+1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	PCIE_CLK-	12	N/C
13	PCIE_CLK+	14	N/C
15	GND	16	N/C
17	RESET	18	GND
19	N/C	20	+3.3V
21	GND	22	RESET
23	PCIE_RN4	24	+3.3V
25	PCIE_RP4	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TN4	32	SMB_DATA
33	PCIE_TP4	34	GND
35	GND	36	-USBP
37	GND	38	+USBP
39	+3.3V	40	GND
41	+3.3V	42	N/C

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	+1.5V
49	N/C	50	GND
51	N/C	52	+3.3V

Table 6-4: Half-Size PCIe Mini Card Slot (CN3) Pinouts

6.2.4 Full-Size PCIe Mini Slot (CN5)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE-WAKE	2	+3.3V
3	N/C	4	GND
5	N/C	6	+1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	PCIE_CLK-	12	N/C
13	PCIE_CLK+	14	N/C
15	GND	16	N/C
17	RESET	18	GND
19	N/C	20	+3.3V
21	GND	22	RESET
23	PCIE_RN4	24	+3.3V
25	PCIE_RP4	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TN4	32	SMB_DATA
33	PCIE_TP4	34	GND
35	GND	36	-USBP
37	GND	38	+USBP
39	+3.3V	40	GND
41	+3.3V	42	N/C

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	+1.5V
49	N/C	50	GND
51	N/C	52	+3.3V

Table 6-5: Full-Size PCIe Mini Card Slot (CN5) Pinouts

6.2.5 Full-Size PCIe Mini Slot for mSATA (JP2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	N/C	2	+3.3V
3	N/C	4	GND
5	N/C	6	N/C
7	N/C	8	N/C
9	GND	10	N/C
11	N/C	12	N/C
13	N/C	14	N/C
15	GND	16	N/C
17	N/C	18	GND
19	N/C	20	N/C
21	GND	22	N/C
23	SATA_RXP	24	+3.3V
25	SATA_RXN	26	GND
27	GND	28	N/C
29	GND	30	N/C
31	SATA_TXN	32	N/C
33	SATA_TXP	34	GND
35	GND	36	N/C
37	GND	38	N/C
39	+3.3V	40	GND
41	+3.3V	42	N/C
43	GND	44	N/C

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
45	N/C	46	N/C
47	N/C	48	N/C
49	N/C	50	GND
51	N/C	52	+3.3V

Table 6-6: Full-Size PCIe Mini Card Slot (CN2) Pinouts

6.2.6 RS-485 Connector (CN8)

PIN NO.	DESCRIPTION
1	TXD485#
2	TXD485+

Table 6-7: RS-485 Connector (CN8) Pinouts

6.2.7 SATA Connector (SATA2)

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 6-8: SATA Connector (SATA2) Pinouts

6.2.8 SATA Power Connector (SATA_PWR1)

PIN NO.	DESCRIPTION
1	+12V
2	GND
3	GND
4	+5V

Table 6-9: SATA Power Connector (SATA_PWR2) Pinouts

6.2.9 SPI Flash Connector (JSPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPI_VCC	2	GND
3	CS#	4	CLK
5	MISO	6	MOSI
7	N/C	8	N/C

Table 6-10: SPI Flash Connector (JSPI1) Pinouts

Appendix

A

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 IDS-H61.

A.1 Safety Precautions

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

A.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 IDS-H61 is opened.
- **Make sure the power is turned off and the power cord is disconnected** whenever the IDS-H61 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 IDS-H61 chassis is opened when the IDS-H61 is running.
- **Do not drop or insert any objects** into the ventilation openings of the IDS-H61.
- **If considerable amounts of dust, water, or fluids enter the IDS-H61**, turn off the power supply immediately, unplug the power cord, and contact the IDS-H61 vendor.
- **DO NOT**:
  - Drop the IDS-H61 against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

![warning icon] **WARNING:**

Failure to take ESD precautions during the installation of the IDS-H61 may result in permanent damage to the IDS-H61 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IDS-H61. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IDS-H61 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

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

A.1.3 Product Disposal

⚠️ **CAUTION:**

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

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:
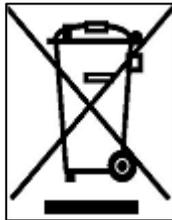
EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need 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.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the IDS-H61, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the IDS-H61, please read the details below.

- The interior of the IDS-H61 does not require cleaning. Keep fluids away from the IDS-H61 interior.

- Be cautious of all small removable components when vacuuming the IDS-H61.
- Turn the IDS-H61 off before cleaning the IDS-H61.
- Never drop any objects or liquids through the openings of the IDS-H61.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the IDS-H61.
- Avoid eating, drinking and smoking within vicinity of the IDS-H61.

A.2.2 Cleaning Tools

Some components in the IDS-H61 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 IDS-H61.

- *Cloth* – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the IDS-H61.
- *Water or rubbing alcohol* – A cloth moistened with water or rubbing alcohol can be used to clean the IDS-H61.
- *Using solvents* – The use of solvents is not recommended when cleaning the IDS-H61 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 IDS-H61. Dust and dirt can restrict the airflow in the IDS-H61 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

B

BIOS Menu Options

B.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 4**.

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

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

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

INT 15H:

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

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

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

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

NOTE:

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

Example program:

; **INITIAL TIMER PERIOD COUNTER**

;

W_LOOP:

  MOV AX, 6F02H   ;setting the time-out value

  MOV BL, 30   ;time-out value is 48 seconds

  INT   15H

 ;

; **ADD THE APPLICATION PROGRAM HERE**

;

  CMP EXIT_AP, 1 ;is the application over?

  JNE   W_LOOP ;No, restart the application

  MOV AX, 6F02H ;disable Watchdog Timer

  MOV BL, 0   ;

  INT   15H

;

; **EXIT** ;