



**MODEL:  
IDS-310-AL**

**Embedded System with Intel® Celeron® N3350E/J3455E,  
Three HDMI, Dual GbE LAN, RS-232/422/485, SATA 6Gb/s,  
Audio Jacks, USB 3.2 Gen 1, RoHS Compliant**

## **User Manual**

# Revision

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Date	Version	Changes
March 13, 2020	1.00	Initial release

# Copyright

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# Safety Instructions

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- en** Warning! Read the user manual before connecting the system to the power source.
- de** Vorsicht! Bitte lesen Sie die Bedienungsanleitung, bevor Sie das System an eine Stromquelle anschließen.
- fr** Attention! Avant de brancher le système à la source d'alimentation, consultez le mode d'emploi.
- it** Avvertenza! Consultare il manuale utente prima di collegare il sistema all'alimentatore.
- es** Atención! Lea atentamente este manual del usuario antes de operar la fuente de alimentación.
- zh** 警告！在將系統連接到電源之前，請仔細閱讀使用手冊。
- cn** 警告！在將系統連接到電源之前，請仔細閱讀使用手冊。
- 

- en** Warning! To prevent the system from overheating, do not operate it in an area that exceeds the maximum operating temperature described in the user manual.
- de** Vorsicht! Um eine Überhitzung des Systems zu vermeiden, betreiben Sie es ausschließlich im zulässigen Betriebstemperaturbereich. Dieser ist in der Bedienungsanleitung vermerkt.
- fr** Attention! Pour éviter la surchauffe du système, ne l'utilisez pas dans une zone dont la température dépasse les limites décrits dans le mode d'emploi.
- it** Avvertenza! Per evitare che il sistema si surriscaldi, non utilizzarlo in aree che superino la temperatura massima d'esercizio descritta nel manuale utente.
- es** Atención! Para evitar el excesivo calentamiento del sistema, no opere en las condiciones de temperatura superior a lo recomendado en este manual del usuario.
- zh** 警告！為防止系統過熱，不要在超過使用手冊上記載的產品工作溫度範圍之外操作此系統。
- cn** 警告！為防止系統過熱，不要在超過使用手冊上記載的產品工作溫度範圍之外操作此系統。
-

## IDS-310-AL Embedded System

- en** Warning! Use only the adapter and power cord approved for this system. Use of another type of adapter may risk fire or explosion. Please refer to the user manual for the power adapter specifications.
- de** Vorsicht! Nur zugelassene Netzteile und Netzkabel dürfen verwendet werden. Die Benutzung von anderen Netzteilen kann einen Brand oder eine Explosion zur Folge haben. Prüfen Sie die jeweiligen Spezifikationen in der Bedienungsanleitung.
- fr** Attention! Utilisez exclusivement le câble d'alimentation et l'adaptateur homologués pour ce système. L'utilisation d'un autre type d'adaptateur risquerait de provoquer un incendie ou une explosion. Veuillez référer au mode d'emploi pour les spécifications de l'adaptateur d'alimentation.
- it** Avvertenza! Utilizzare solo l'adattatore e il cavo di alimentazione approvati per questo sistema. L'uso di un altro tipo di adattatore può causare rischio d'incendio o esplosione. Si prega di fare riferimento al manuale utente per le specifiche sull'alimentazione.
- es** Atención! Utilice solamente el adaptador de corriente alterna (CA) con Marcas Conformidad otorgadas. Cualquier otro adaptador no otorgado aumenta el riesgo de explosión o incendio. Por favor consulte el manual del usuario para las especificaciones del adaptador de alimentación.
- zh** 警告！只能使用經過認證、適用於本系統的電源變壓器與電源線。使用不適用的電源變壓器將可能導致火災或爆炸。電源變壓器規格請參考使用手冊。
- cn** 警告！只能使用经过认证，适用于本系统的电源适配器与电源线。使用不适用的电源适配器将可能导致火灾或爆炸。电源适配器规格请参考使用手冊。

- 
- en** Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.
- de** Vorsicht! Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.
- fr** Attention! La mise au rebut ou le recyclage de ce produit sont généralement soumis aux lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.
- it** Avvertenza! Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e i regolamenti locali.
- es** Atención! La disposición final de residuos de este producto se debe cumplir con las normativas y leyes del país.
- zh** 警告！本產品的廢棄處理應根據該國家的法律和規章進行。
- cn** 警告！本产品的废弃处理应根据该国家的法律和规章进行。
-

# Manual Conventions

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## **WARNING**

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



## **CAUTION**

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



## **NOTE**

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



## **HOT SURFACE**

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

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Chapter

1

# Introduction

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## 1.1 Overview



**Figure 1-1: IDS-310-AL Series Embedded System**

The IDS-310-AL series is a fanless embedded system with Intel® Celeron® N3350E or J3455E SoC. The IDS-310-AL is preinstalled with 4 GB of DDR3L SO-DIMM, and can accommodate up to 8 GB of DDR3L memory. Storage in the system is supported by the full-size PCIe Mini card slot for mSATA module or the SATA 6Gb/s connector for SATA DOM.

The IDS-310-AL includes three HDMI outputs supporting up to 3840 x 2160 resolutions. Other slots and connectors include one RS-232/422/485, two GbE ports, three USB 3.2 Gen 1 (5Gb/s) ports, audio (line-out and mic-in) and one M.2 A-key 2230 slot for an optional Wi-Fi module.



## IDS-310-AL Embedded System

### 1.2 Features

The IDS-310-AL has the following features

- Fanless design
- Intel® Celeron® N3350E/J3455E SoC platform delivers an optimized balance between performance and power consumption
- Three HDMI connectors supporting triple independent display with up to 3840 x 2160 resolution
- Two GbE LAN for high speed network applications
- One full-size PCIe Mini card slot with SIM card slot (supports mSATA modules or WWAN modules)
- One SATA 6Gb/s connector for SATA DOM
- Three USB 3.2 Gen 1 (5Gb/s) ports
- One RS-232/422/485 serial port
- Support audio line-out and mic-in
- RoHS compliant design

### 1.3 Model Variations

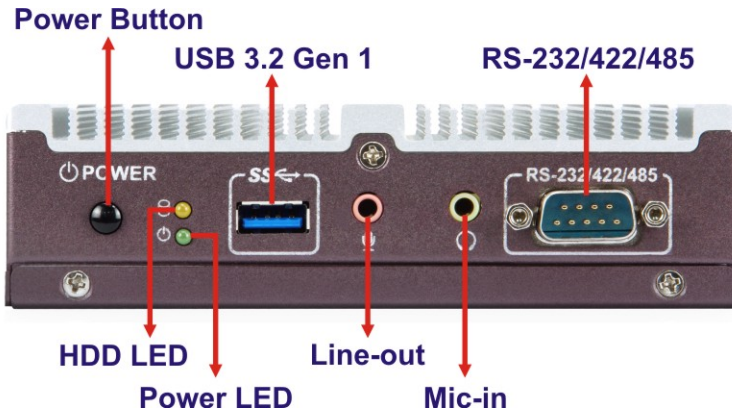
The model variations of the IDS-310-AL are listed below.

Model No.	SoC	Dimensions
IDS-310-AL-N1/4GB	Intel® Celeron® N3350E	137 x 102.8 x 38.1 (mm)
IDS-310-AL-J1/4GB	Intel® Celeron® J3455E	137 x 102.8 x 52.1 (mm)

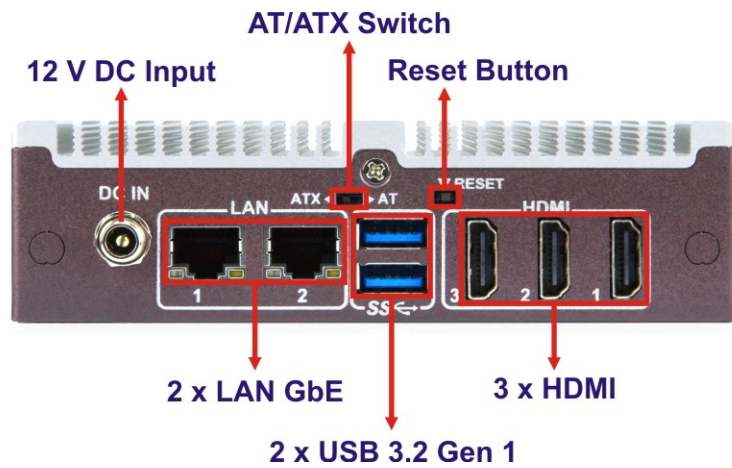
**Table 1-1: IDS-310-AL Model Variations**

### 1.4 I/O Panels

The I/O panels of the IDS-310-AL are shown in **Figure 1-2** and **Figure 1-3**.



**Figure 1-2: I/O Panel - Front**



**Figure 1-3: I/O Panel - Rear**

## IDS-310-AL Embedded System

### 1.5 Bottom Panel

The bottom panel of the IDS-310-AL contains four screw holes for mounting. The bottom panel also provides access to the internal components, including SO-DIMM slot, PCIe Mini card slot and M.2 module slot.

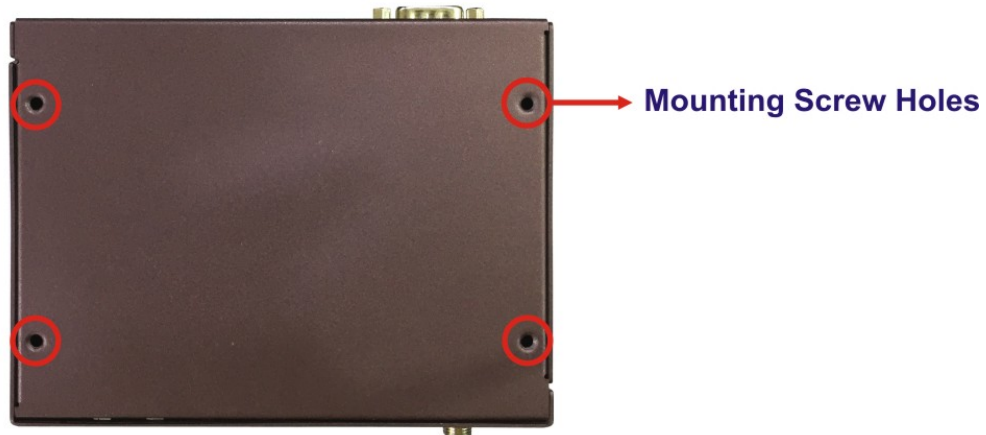


Figure 1-4: Bottom Panel

### 1.6 Technical Specifications

The specifications for the IDS-310-AL are listed below.

	IDS-310-AL
<b>CPU</b>	<b>N1 SKU:</b> Intel® Celeron® N3350E (up to 2.4 GHz, dual-core, TDP 6 W) <b>J1 SKU:</b> Intel® Celeron® J3455E (up to 2.3 GHz, quad-core, TDP 10 W)
<b>System Memory</b>	1 x 204-pin DDR3L SDRAM SO-DIMM slot (system max. 8 GB) 4 GB DDR3L SO-DIMM preinstalled
<b>Display</b>	3 x HDMI 1.4b connector (up to 3840x2160 @ 30Hz) <i>(HDMI 3 does not support audio)</i>
<b>Ethernet</b>	2 x GbE LAN RJ-45 by Realtek RTL8111H GbE controller
<b>Serial Port</b>	1 x RS-232/422/485 DB-9 serial port
<b>USB</b>	3 x USB 3.2 Gen 1 (5Gb/s) port

<b>Audio</b>	7.1+2 channel Realtek ALC888 HD Audio codec 1 x Line-out jack 1 x Mic-in jack	
<b>SATA</b>	1 x SATA 6Gb/s connector for SATA DOM	
<b>Expansion Slot</b>	1 x Full-size PCIe Mini slot (PCIe x1, USB 2.0, SATA) with on-board SIM card slot for WWAN modules, or mSATA modules 1 x M.2 A-key 2230 slot (PCIe x1, USB 2.0) for optional Wi-Fi module	
<b>Wireless</b>	Optional Wi-Fi 802.11a/b/g/n/ac	
<b>Buttons and Indicators</b>	1 x Power button 1 x Reset button 1 x AT/ATX power mode switch	1 x Power LED (green) 1 x HDD LED (yellow)
<b>Mounting</b>	VESA 75/100 via mounting bracket	
<b>Power Input</b>	12 V DC	
<b>Power Consumption</b>	12V @ 1.9A (Intel® Celeron® N3350E with 4GB memory) 12V @ 2.2A (Intel® Celeron® J3455E with 4GB memory)	
<b>Operating Temperature</b>	-20°C ~ 60°C	
<b>Storage Temperature</b>	-30°C ~ 80°C	
<b>Operating Humidity</b>	10% ~ 90%, non-condensing	
<b>Color</b>	Brown & Silver	
<b>Chassis Construction</b>	Extruded aluminum alloys	
<b>Dimensions (W x D x H)</b>	<b>N1 SKU:</b> 137 mm x 102.8 mm x 38.1 mm <b>J1 SKU:</b> 137 mm x 102.8 mm x 52.1 mm	
<b>Operation Vibration</b>	MIL-STD-810F 514.6C-1 with mSATA	
<b>Operation Shock</b>	Half-sine wave shock 5G, 11ms, 100 shocks per axis	
<b>Weight (Net/Gross)</b>	<b>N1 SKU:</b> 680 g / 1.4 kg <b>J1 SKU:</b> 950 g / 1.7 kg	
<b>EMC</b>	CE, FCC Class A, BSMI	
<b>Supported OS</b>	Microsoft Windows 10 Linux	

**Table 1-2: Technical Specifications**

## IDS-310-AL Embedded System

### 1.7 Dimensions

The physical dimensions of the IDS-310-AL series with its mounting kit are shown below.

#### 1.7.1 IDS-310-AL-N1 Dimensions

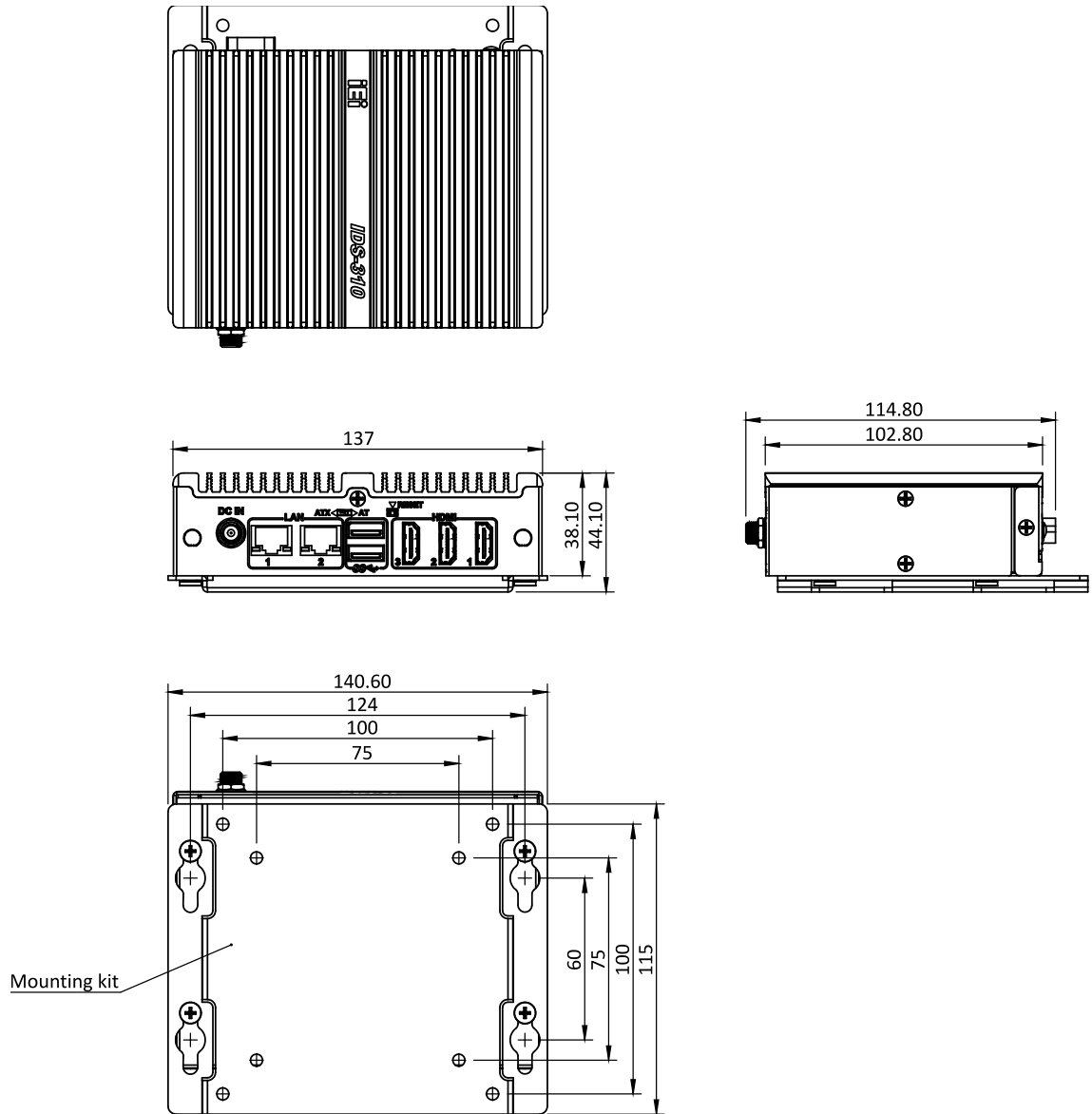
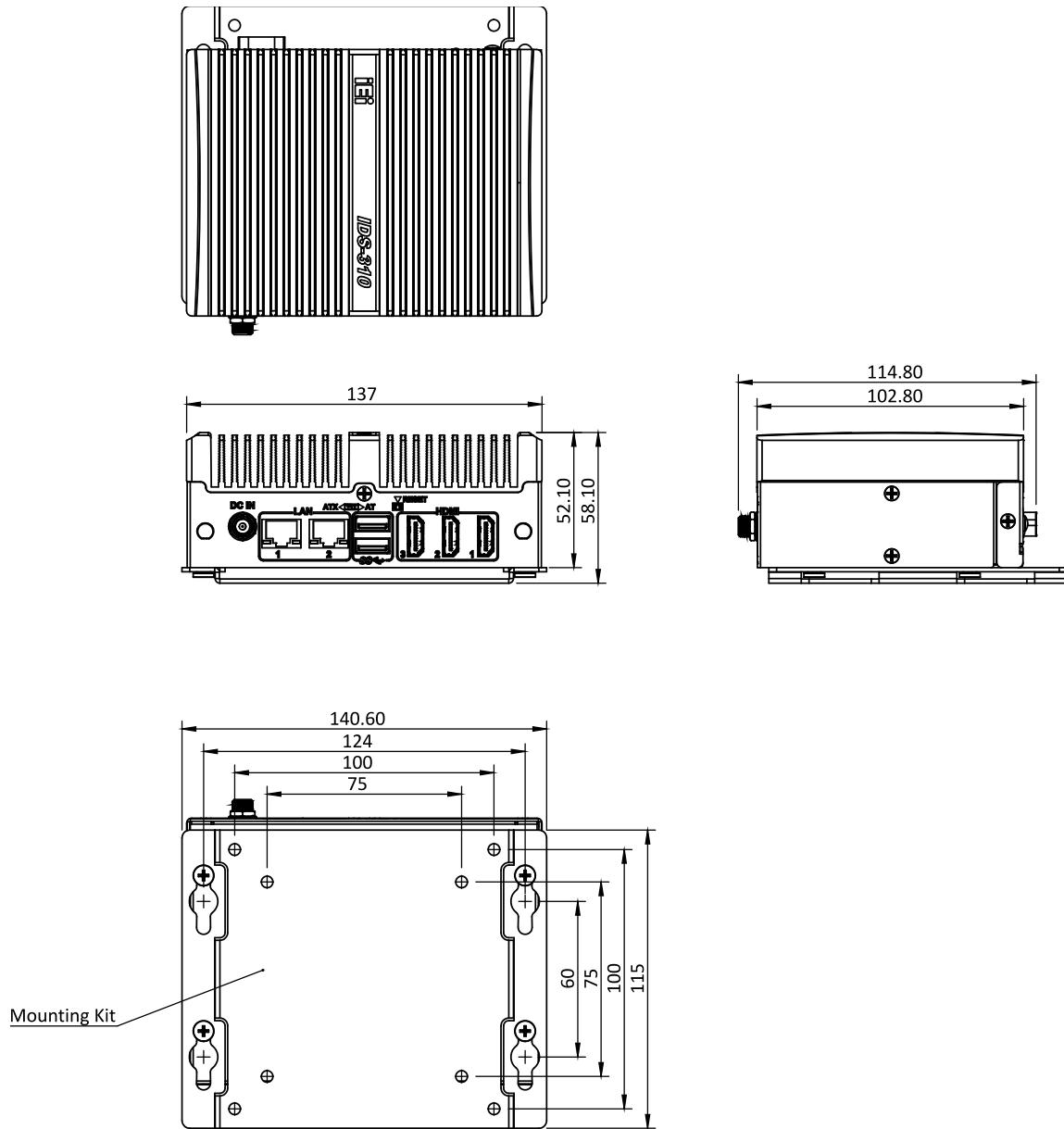


Figure 1-5: IDS-310-AL-N1 Dimensions (mm)

**1.7.1 IDS-310-AL-J1 Dimensions**



**Figure 1-6: IDS-310-AL-J1 Dimensions (mm)**

Chapter

2

# Unpacking

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## 2.1 Unpacking

To unpack the system, follow the steps below:

- Step 1:** Use box cutters, a knife or a sharp pair of scissors that seals the top side of the external (second) box.
- Step 2:** Open the external (second) box.
- Step 3:** Use box cutters, a knife or a sharp pair of scissors that seals the top side of the internal (first) box.
- Step 4:** Lift the system out of the boxes.
- Step 5:** Remove both polystyrene ends, one from each side.
- Step 6:** Make sure all the components listed in the packing list are present.


## 2.2 Packing List



**NOTE:**



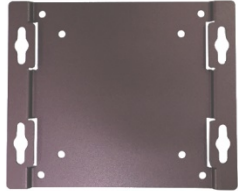

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IDS-310-AL was purchased from or contact an IEI sales representative directly by sending an email to [sales@ieiworld.com](mailto:sales@ieiworld.com).

The IDS-310-AL is shipped with the following components:

Quantity	Item	Image
1	IDS-310-AL embedded system	





## IDS-310-AL Embedded System

1	Power adapter (36 W)	
1	Power cord	
1	VESA mount bracket	
4	Screws (M4*6) for VESA mounting	

**Table 2-1: Package List**

## 2.3 Optional Items

The following are optional component(s) which may be separately purchased:

Wi-Fi module* (P/N: 27319-000007-RS)	
External antenna (P/N: 32505-000900-100-RS)	
RF cable, 250mm (P/N: 32501-004000-100-RS)	

*\*Each Wi-Fi module needs two external antennas and two RF cables to fully support Wi-Fi function.*

**Table 2-2: Optional Items**

Chapter

**3**

# Installation

---

## IDS-310-AL Embedded System

### 3.1 Anti-static Precautions

---



#### WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the IDS-310-AL and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IDS-310-AL. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IDS-310-AL 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-310-AL, place it on an anti-static pad. This reduces the possibility of ESD damaging the IDS-310-AL.

### 3.2 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual:** The user manual provides a complete description of the IDS-310-AL, installation instructions and configuration options.
- **DANGER! Disconnect Power:** Power to the IDS-310-AL must be disconnected during the installation process, or before any attempt is made to access the bottom panel. Electric shock and personal injury might occur if the bottom panel of the IDS-310-AL is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel:** The IDS-310-AL 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-310-AL. The IDS-310-AL must not be obstructed by any objects. Leave at least 5 cm of clearance around the IDS-310-AL to prevent overheating.
- **Grounding:** The IDS-310-AL 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-310-AL.

### 3.2.1 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.

## IDS-310-AL Embedded System

### 3.3 Bottom Surface Removal

Before internal devices can be installed, the bottom surface must be removed. To remove the bottom surface, please follow the steps below:

**Step 1:** Remove the bottom surface retention screws. The bottom surface is secured to the chassis with four (4) retention screws (**Figure 3-1**). All four (4) screws must be removed.

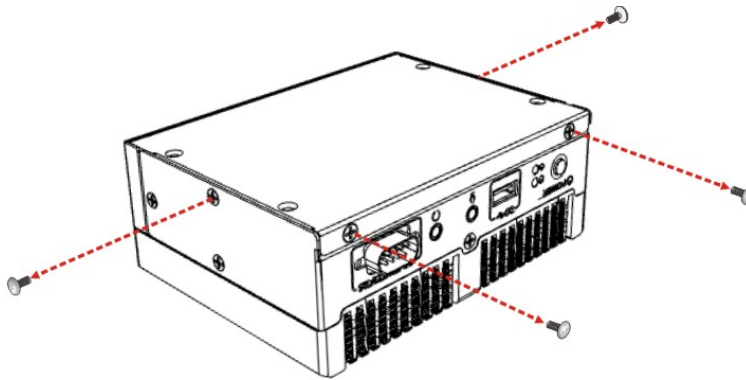


Figure 3-1: Bottom Surface Retention Screws

**Step 2:** Gently lift and remove the bottom surface from the IDS-310-AL.

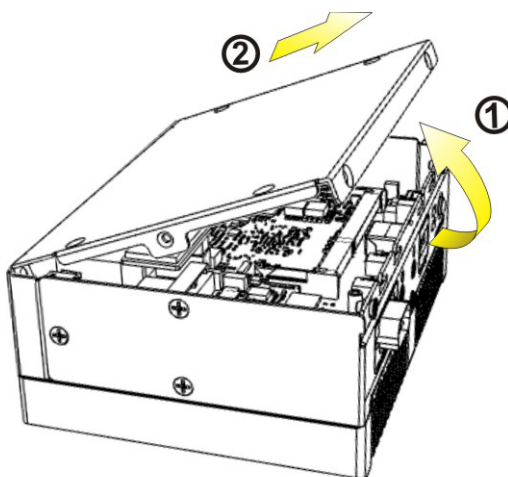
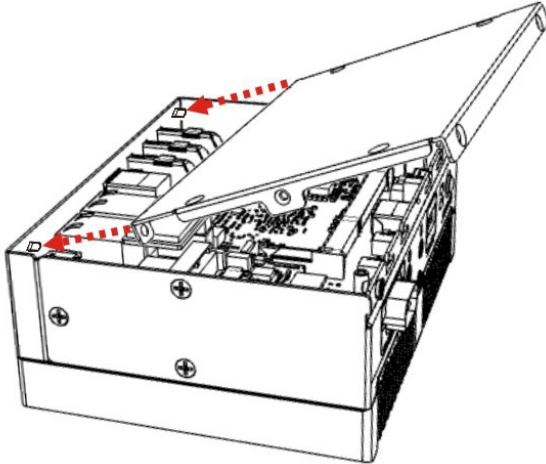


Figure 3-2: Bottom Surface Removal

### 3.3.1 Bottom Surface Re-installation

To re-install the bottom surface, insert the two screw holes in the bottom surface into the two studs inside the chassis first, so that the bottom surface can be positioned correctly and installed easily.



**Figure 3-3: Bottom Surface Installation**

### 3.4 Wireless LAN Module Installation (Optional)

To install the optional wireless LAN (WLAN) module, please follow the steps below.

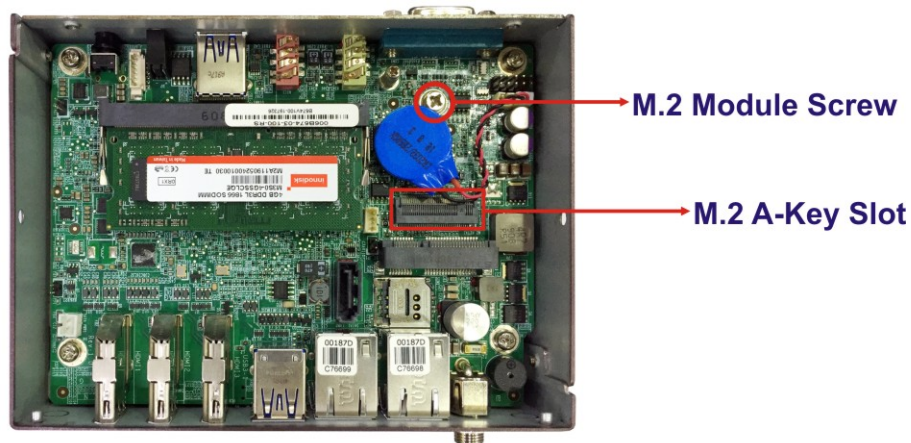
- Step 1:** Remove the bottom surface. See **Section 3.3**.
- Step 2:** Remove the two knockouts for antenna installation. The two knockouts are located on the rear panel of the IDS-310-AL as shown in **Figure 3-4**.



**Figure 3-4: Knockouts for Wireless Antenna**

## IDS-310-AL Embedded System

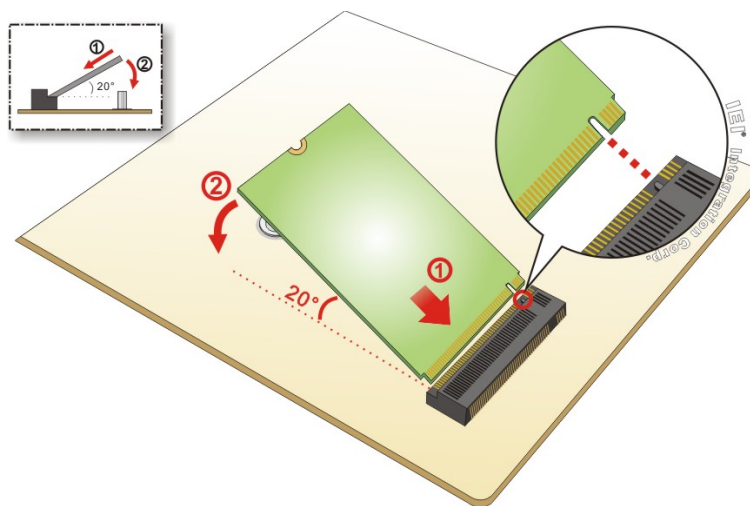
**Step 3:** Locate the M.2 A-key slot on the motherboard (Figure 3-5).



**Figure 3-5: M.2 A-key Slot Location**

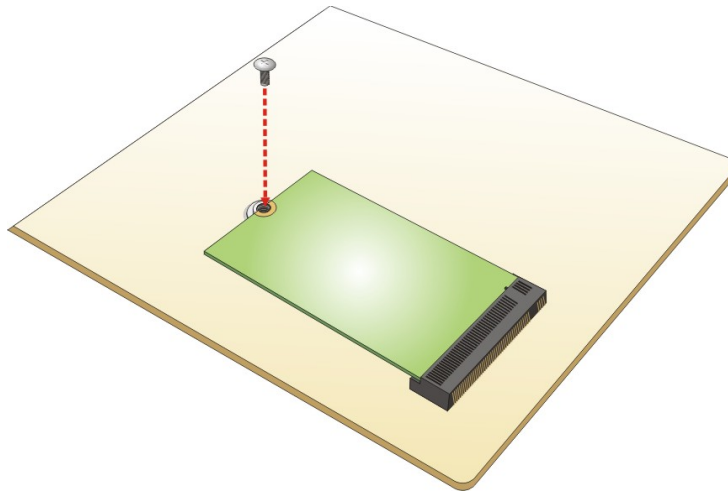
**Step 1:** Detach the RTC battery and remove the M.2 module retention screw from the motherboard.

**Step 2:** Line up the notch on the WLAN module with the notch on the slot. Slide the WLAN module into the slot at an angle of about 20° (Figure 3-6).



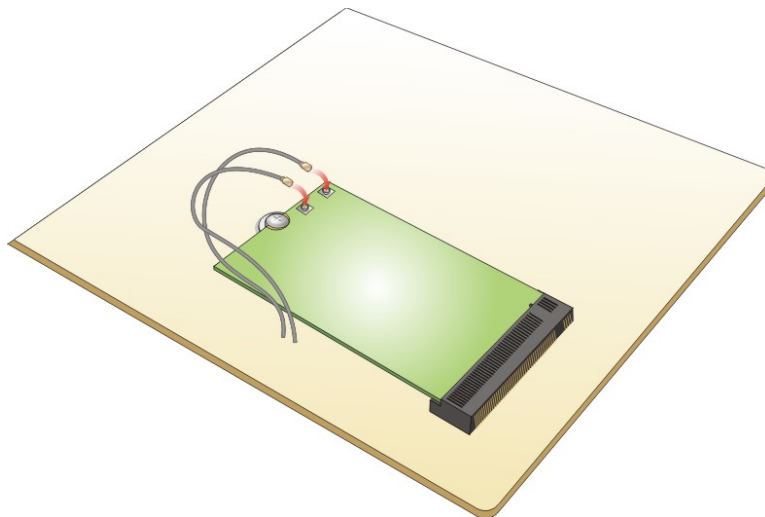
**Figure 3-6: Inserting the WLAN Module**

**Step 3:** Secure the WLAN module with the retention screw previously removed (Figure 3-8).



**Figure 3-7: Securing the WLAN Module**

**Step 4:** Connect the two RF cables to the antenna connectors on the WLAN module (Figure 3-8).



**Figure 3-8: Connecting RF Cables**

**Step 5:** Remove the nut and washer from the SMA connector at the other end of the RF cable.

**Step 6:** Insert the SMA connector to the antenna connector holes on the rear panel.

**Step 7:** Secure the SMA connector by inserting the washer and tightening it with nut.



## IDS-310-AL Embedded System

**Step 8:** Install the external antenna.

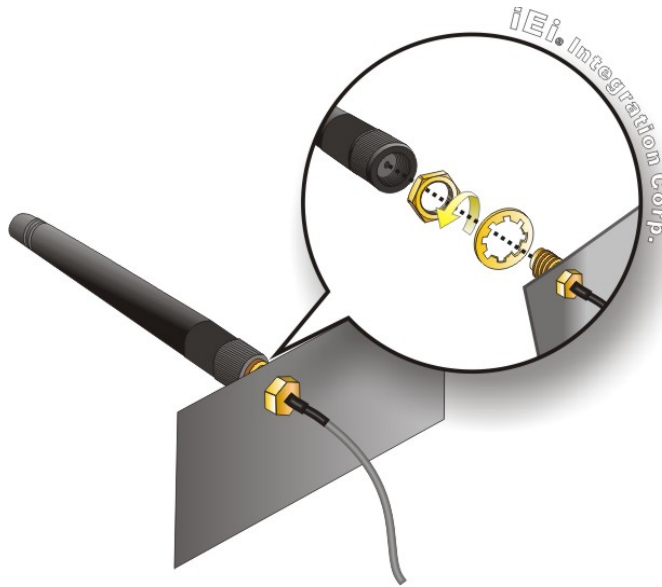


Figure 3-9: Securing SMA Connector and External Antenna Installation

### 3.5 PCIe Mini Module Installation

To install a PCIe Mini module, please follow the steps below.

**Step 1:** Remove the bottom surface. See **Section 3.3**.

**Step 2:** Locate the full-size PCIe Mini slot (**Figure 3-10**).

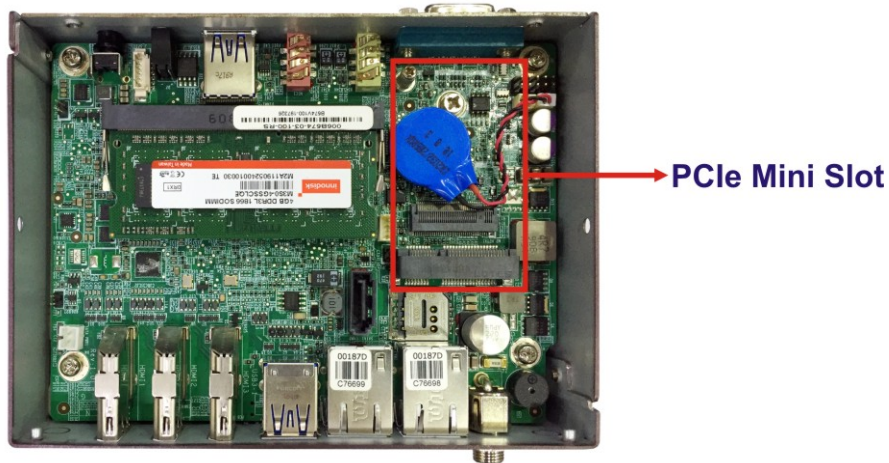
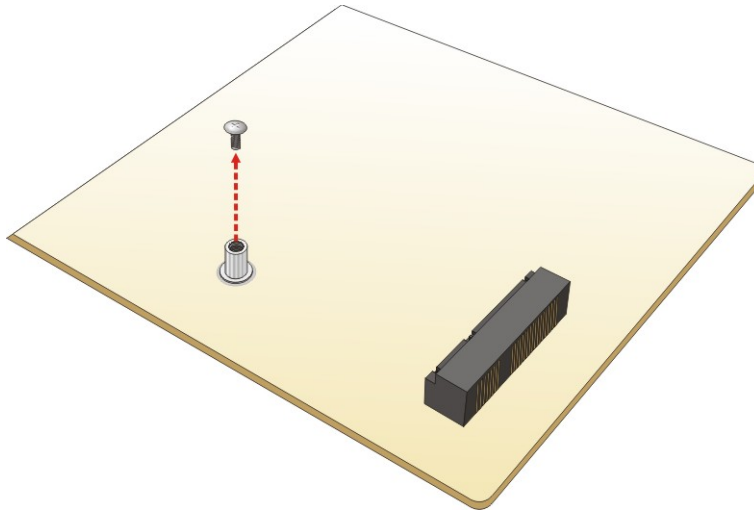


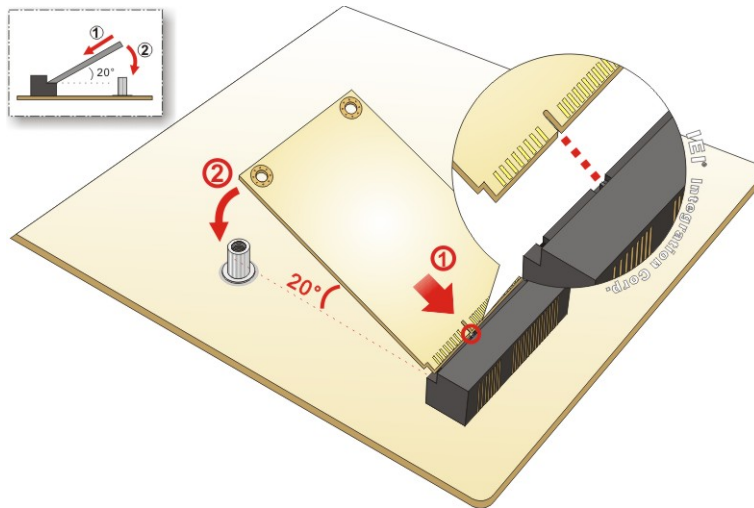
Figure 3-10: PCIe Mini Slot Location

**Step 3:** Detach the RTC battery from the motherboard, and remove the retention screw as shown in **Figure 3-11**.



**Figure 3-11: Removing the Retention Screws**

**Step 4:** Insert into the socket at an angle. Line up the notch on the card with the notch on the slot. Slide the PCIe Mini module into the socket at an angle of about 20° (**Figure 3-12**).



**Figure 3-12: Inserting the PCIe Mini Module into the Slot at an Angle**

**Step 5:** Secure the PCIe Mini module with the retention screws previously removed (**Figure 3-13**).

## IDS-310-AL Embedded System

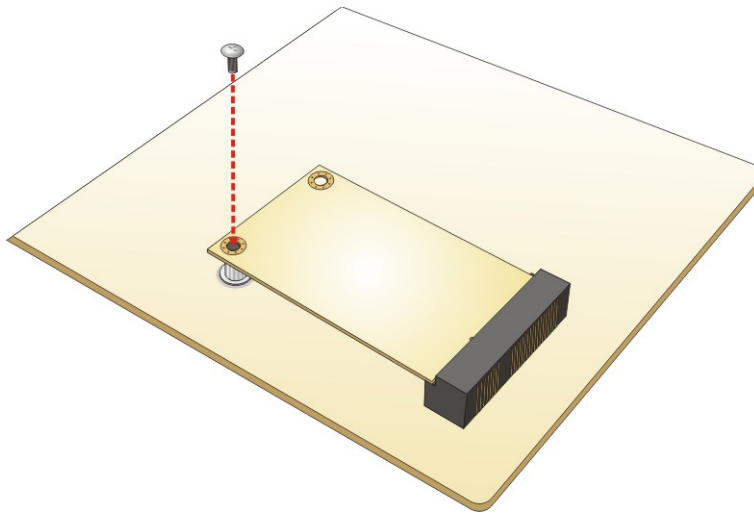


Figure 3-13: Securing the PCIe Mini Module

**Step 6:** Attach the RTC battery onto the PCIe Mini module.

### 3.6 AT/ATX Power Mode Selection

AT and ATX power modes can both be used on the IDS-310-AL series. The selection is made through an AT/ATX switch on the rear panel (Figure 1-3).

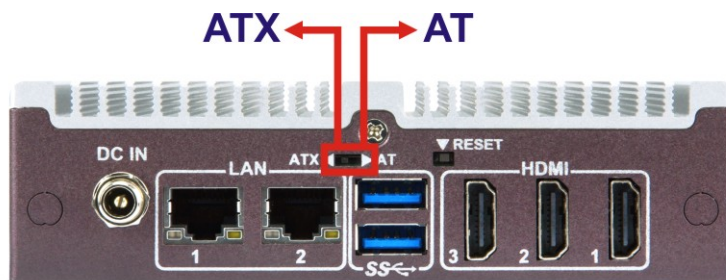
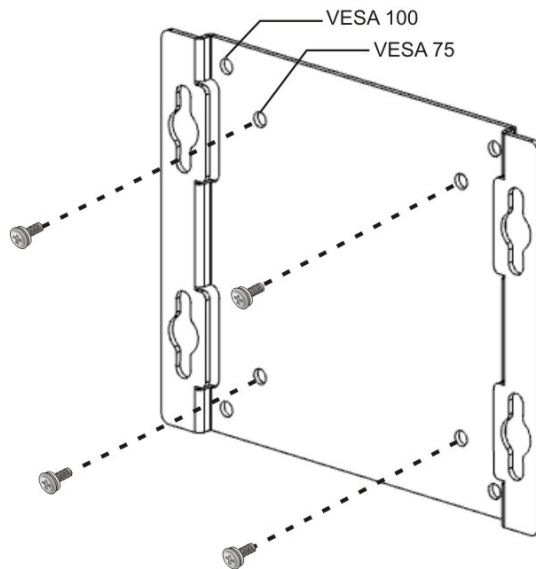


Figure 3-14: AT/ATX Switch Location

### 3.7 Mounting the System

To mount the IDS-310-AL onto a VESA 75/100 surface using the mounting bracket, please follow the steps below.

**Step 1:** Attach the mounting bracket to a VESA 75/100 mounting surface with four screws. Make sure it is attached securely. See **Figure 3–15**.



**Figure 3–15: Attach Mounting Bracket**

**Step 2:** Screw the included mounting screws (M4\*6) to the mounting holes on the bottom of the IDS-310-AL (**Figure 3–16**).

**Step 3:** Hook the IDS-310-AL into the mounting holes on the mounting bracket (**Figure 3–16**).



**NOTE:**

In the diagram below the bracket is already installed on a VESA 75/100 surface.

IDS-310-AL Embedded System

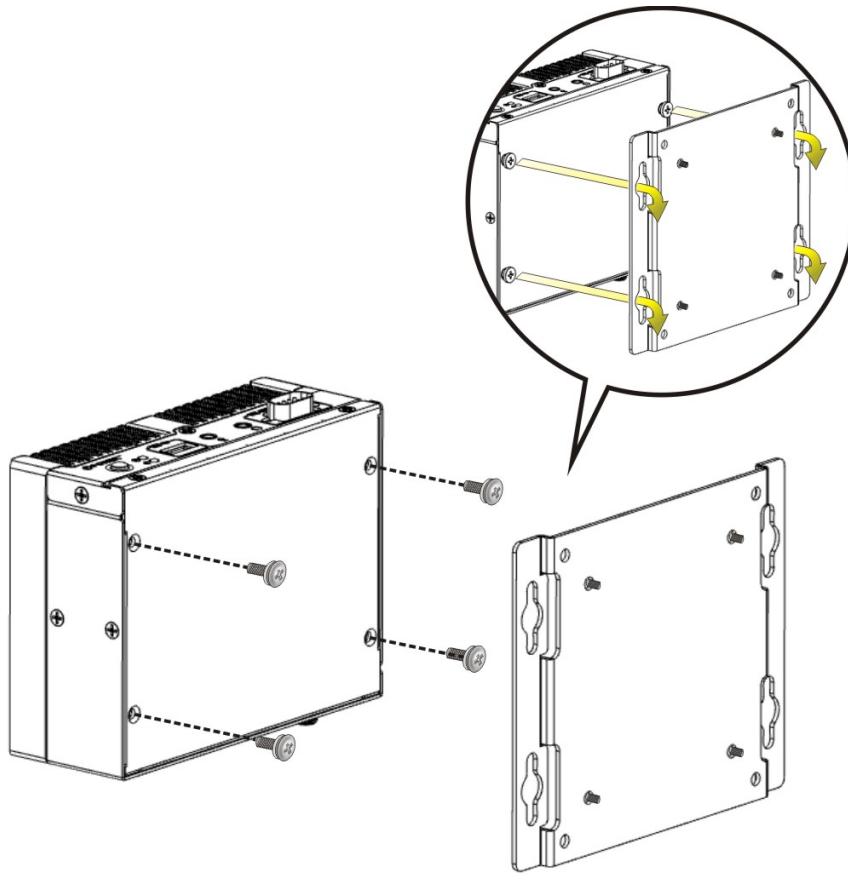


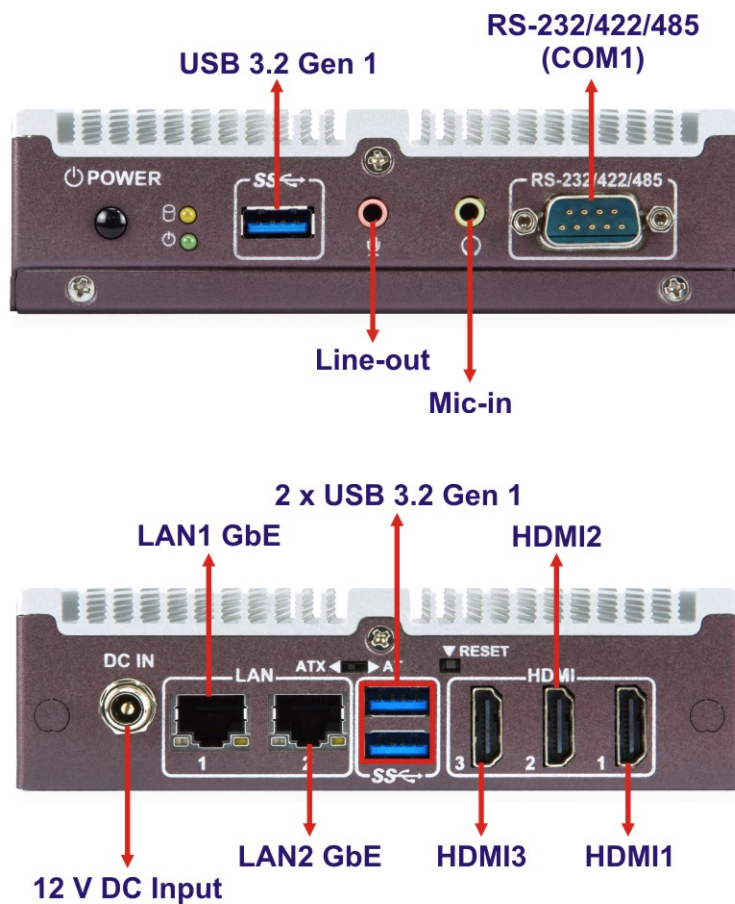
Figure 3-16: Hook Onto Mounting Bracket

### 3.8 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
- HDMI monitors
- Serial port devices
- USB devices

The locations of the external peripheral interface connectors are shown in **Figure 3-17**.



**Figure 3-17: External Peripheral Interface Connectors**

## IDS-310-AL Embedded System

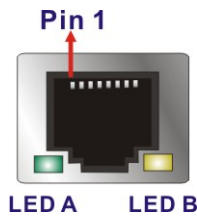
### 3.8.1 LAN Connectors

- CN Label:** LAN1, LAN2
- CN Type:** RJ-45
- CN Pinouts:** See Table 3-1
- CN Location:** See Figure 3-17

The LAN connector allows connection to an external network.

Pin	Description	Pin	Description
1	MDIA0+	5	MDIA2-
2	MDIA0-	6	MDIA1-
3	MDIA1+	7	MDIA3+
4	MDIA2+	8	MDIA3-

**Table 3-1: LAN Connector Pinouts**



**Figure 3-18: 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.

LED	Description	LED	Description
A	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s	B	on: linked blinking: data is being sent/received

**Table 3-2: Ethernet Connector LEDs**

### 3.8.2 HDMI Connectors



**NOTE:**

1. Due to chipset limitation, audio is not supported over the HDMI3 connector.
2. Fully support of triple 4K display output may vary in different system environment setting. In some conditions, the IDS-310-AL may only support two 4K outputs plus one Full HD output via the three HDMI connectors. To setup a triple 4K display connection in Windows, make sure the following graphics driver version is installed in the system: Intel® Graphics Driver - 64 Bit (22.20.16.4785).

- CN Label:** HDMI1, HDMI2, HDMI3
- CN Type:** HDMI connector
- CN Pinouts:** See **Table 3-3** and **Figure 3-19**
- CN Location:** See **Figure 3-17**

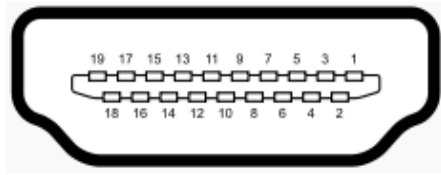
The HDMI connector can connect to an HDMI device. The HDMI connectors support up to 3840x2160 @ 30Hz.

Pin	Description	Pin	Description
1	HDMI_DATA2+	11	GND
2	GND	12	HDMI_CLK#
3	HDMI_DATA2#-	13	N/C
4	HDMI_DATA1+	14	N/C
5	GND	15	HDMI_SCL
6	HDMI_DATA1#-	16	HDMI_SDA
7	HDMI_DATA0+	17	GND
8	GND	18	+5V
9	HDMI_DATA0#-	19	HDMI_HPD
10	HDMI_CLK+		

**Table 3-3: HDMI Connector Pinouts**



## IDS-310-AL Embedded System



**Figure 3-19: HDMI Connector**

### 3.8.3 Power Connector

- CN Label:** PWR1
- CN Type:** DC jack
- CN Pinouts:** See **Table 3-4**
- CN Location:** See **Figure 3-17**

The connector supports 12 V power adapters.

Pin	Description
1	12V
2	GND
3	GND

**Table 3-4: Power Connector Pinouts**



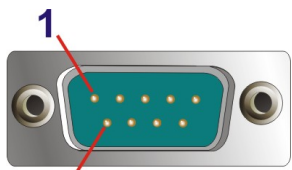
**Figure 3-20: Power Connector**

**3.8.4 RS-232/422/485 Serial Port Connector**

- CN Label:** COM1
- CN Type:** DB-9 male
- CN Pinouts:** See **Table 3-5**
- CN Location:** See **Figure 3-17**

The RS-232/422/485 serial port connector allows connection to a serial device. The serial communication mode selection can be made through the BIOS options. Please refer to **Section 4.3.2.1** for detail information. The pinouts of COM1 are detailed below.

Pin	RS-232	RS-422	RS-485
1	DCD	TXD422-	TXD485-
2	RX	TXD422+	TXD485+
3	TX	RXD422+	
4	DTR	RXD422-	
5	GND		
6	DSR		
7	RTS		
8	CTS		
9	RI		



**Table 3-5: RS-232/422/485 Serial Port Pinouts**

## IDS-310-AL Embedded System

### 3.8.5 USB 3.2 Gen 1 (5Gb/s) Connectors

**CN Label:** USB3-1, USB3-2

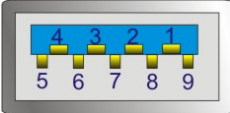
**CN Type:** USB Type A

**CN Pinouts:** See **Table 3-6**

**CN Location:** See **Figure 3-17**

The USB 3.2 Gen 1 (5Gb/s) ports are for connecting USB 2.0 / USB 3.2 Gen 1 peripheral devices to the system.

Pin	Description
1	VBUS
2	DATA-
3	DATA+
4	GND
5	STDA_SSRX_N
6	STDA_SSRX_P
7	GND_DRAIN
8	STDA_SSTX_N
9	STDA_SSTX_P



**Table 3-6: USB 3.2 Gen 1 Port Pinouts**

## 3.9 Power-On Procedure

### 3.9.1 Installation Checklist



#### **WARNING:**

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

To power on the IDS-310-AL please make sure of the following:

- The bottom surface panel is installed
- All peripheral devices (monitor, serial communications devices etc.) are connected
- The power cables are plugged in
- The system is securely mounted

### 3.9.2 Power-on Procedure

To power-on the IDS-310-AL, please follow the steps below.

**Step 1:** Connect the power source to the power input jack.

**Step 2:** Push the power button (**Figure 3-21**).

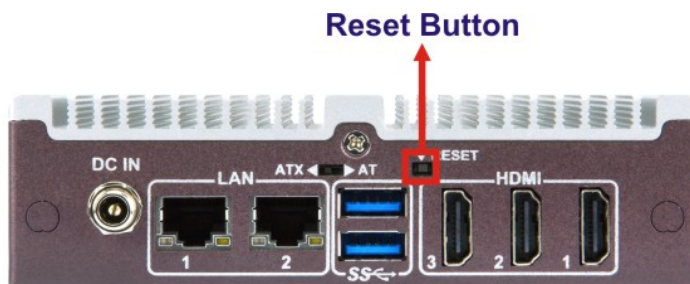
**Step 3:** Once turned on, the power LED indicator should turn on in green.



**Figure 3-21: Power Button and Power LED**

### 3.10 Reset the System

The reset button enables user to reboot the system when the system is turned on. The reset button location is shown in **Figure 3-22**. **Press the reset button** to reboot the system.



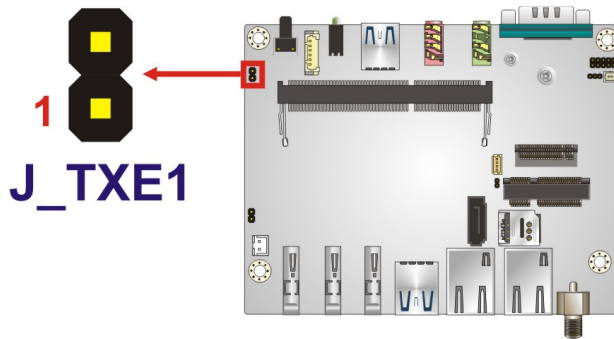
**Figure 3-22: Reset Button Location**

### 3.11 Flash Descriptor Security Override

The Flash Descriptor Security Override jumper (J\_TXE1) allows to enable or disable the ME firmware update. Refer to **Figure 3-23** and **Table 3-7** for the jumper location and settings.

Setting	Description
Open	Disabled (default)
Short	Enabled

**Table 3-7: Flash Descriptor Security Override Jumper Settings**



**Figure 3-23: Flash Descriptor Security Override Jumper Location**

To update the ME firmware, please follow the steps below.

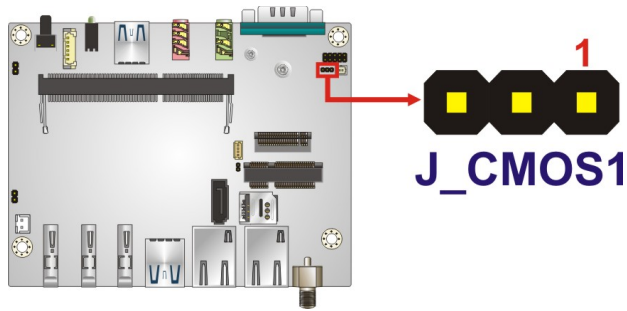
- Step 1:** Before turning on the system power, short the Flash Descriptor Security Override jumper.
- Step 2:** Update the BIOS and ME firmware, and then turn off the system power.
- Step 3:** Remove the metal clip on the Flash Descriptor Security Override jumper.
- Step 4:** Restart the system. The system will reboot 2 ~ 3 times to complete the ME firmware update.

### 3.12 Clear CMOS

To reset the BIOS, move the jumper to the "Clear BIOS" position for 3 seconds or more, then move back to the default position.

Setting	Description
Short 1-2	Keep CMOS setup
Short 2-3	Clear CMOS

**Table 3-8: Clear CMOS Jumper Settings**



**Figure 3-24: Clear CMOS Jumper Location**

Chapter

4

# BIOS

---

## 4.1 Introduction

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

### 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
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



## IDS-310-AL Embedded System

Key	Function
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) 2019 American Megatrends, Inc.
Main  Advanced  Chipset  Boot  Security  Save & Exit

BIOS Information
BIOS Vendor                American Megatrends
Core Version                5.12
Compliance                 UEFI 2.5; PI 1.4
Project Version            B574AT04.ROM
Build Date and Time        09/03/2019 15:5:57

iWDD Vendor                iEi
iWDD Version                B574ET04.bin

Platform firmware Information
BXT SOC                    B1
MRC Version                0.56
PUNIT FW                   38
PMC FW                     03.20
TXE FW                     3.1.65.2288
ISH FW                     4.1.0.3364
GOP                        0.0.0036

Memory Information
Total Memory                4096 MB
Memory Speed                1866 MHz

Access Level                Administrator

System Date                [Fri 01/01/2010]
System Time                [00:10:27]

Set the Date. Use Tab to
switch between Data
elements.

-----
<->: Select Screen
^ v: Select Item
EnterSelect
+ - Change Opt.
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save & Exit
ESC Exit

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
  
```

### BIOS Menu 1: Main

➔ **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.

## IDS-310-AL Embedded System

### 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) 2019 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit

> Trusted Computing
> ACPI Settings
> F81803 Super IO Configuration
> iWDD H/M Monitor
> USB Configuration
> CPU Configuration
> RTC Wake Settings
> Power Saving Configuration
> Serial Port Console Redirection
> iEi Feature

System ACPI Parameters.

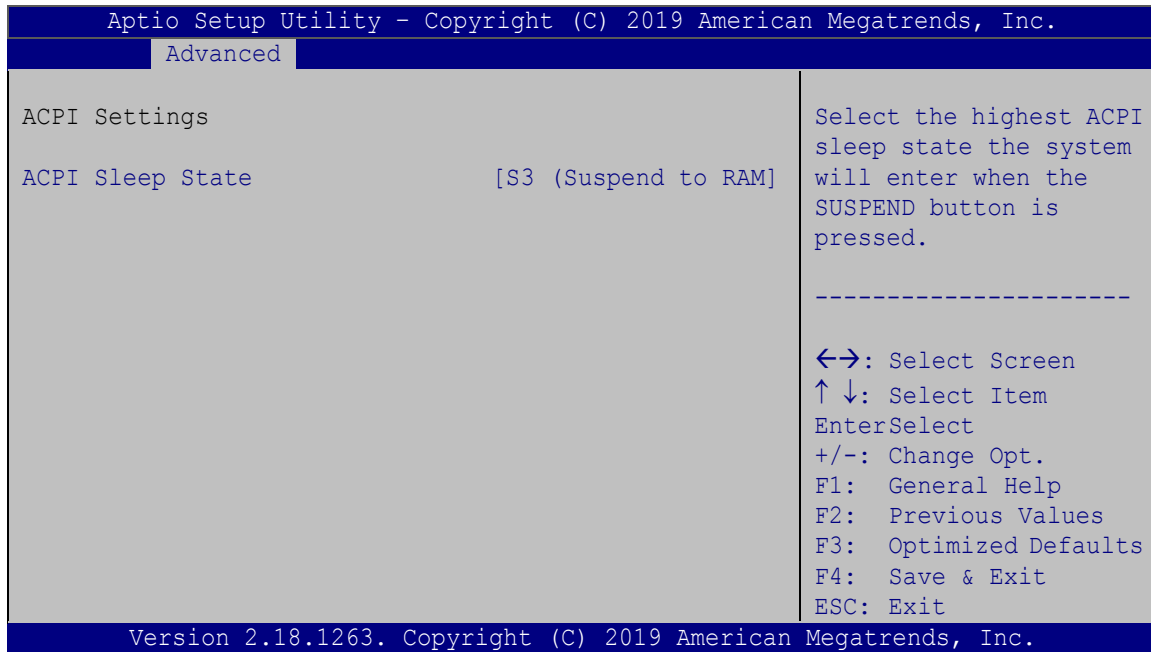
-----
<->: Select Screen
↑ ↓: Select Item
Enter>Select
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save
ESC Exit

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
    
```

#### **BIOS Menu 2: Advanced**

### 4.3.1 ACPI Settings

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



#### BIOS Menu 3: ACPI Settings

##### → ACPI Sleep State [S3 (Suspend to RAM)]

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

- **S3 (Suspend to DEFAULT RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

## IDS-310-AL Embedded System

### 4.3.2 F81803 Super IO Configuration

Use the **F81803 Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  Advanced
F81866 Super IO Configuration                               Set Parameters of Serial
                                                           Port 1 (COMA)
Super IO Chip                                             F81803
> Serial Port 1 Configuration
-----
<->: Select Screen
↑ ↓: Select Item
EnterSelect
+/-: Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
    
```

**BIOS Menu 4: F81803 Super IO Configuration**

#### 4.3.2.1 Serial Port 1 Configuration

Use the **Serial Port 1 Configuration** menu (**BIOS Menu 5**) to configure the serial port 1.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  Advanced
Serial Port 1 Configuration                               Enable or Disable Serial
                                                           Port (COM)
Serial Port                                             [Enabled]
Device Settings                                       IO=3F8h; IRQ=4
Change Settings                                       [IO=3F8h; IRQ=4]
Transfer Mode                                          [RS232]
-----
<->: Select Screen
↑ ↓: Select Item
EnterSelect
+/-: Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
    
```

**BIOS Menu 5: Serial Port 1 Configuration Menu**

### → Serial Port [Enabled]

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

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

### → Change Settings [Auto]

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

- **IO=3F8h; IRQ=4**      **DEFAULT**      Serial Port I/O port address is 3F8h and the interrupt address is IRQ4
- **IO=3F8h;**  
**IRQ=4, 10, 11**                      Serial Port I/O port address is 3F8h and the interrupt address is IRQ4, 10, 11
- **IO=2F8h;**  
**IRQ=4, 10, 11**                      Serial Port I/O port address is 2F8h and the interrupt address is IRQ4, 10, 11
- **IO=3E8h;**  
**IRQ=4, 10, 11**                      Serial Port I/O port address is 3E8h and the interrupt address is IRQ4, 10, 11
- **IO=2E8h;**  
**IRQ=4, 10, 11**                      Serial Port I/O port address is 2E8h and the interrupt address is IRQ4, 10, 11

### → Transfer Mode [RS232]

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

- **RS422**                      Serial Port 1 signaling mode is RS-422
- **RS232**      **DEFAULT**      Serial Port 1 signaling mode is RS-232
- **RS485**                      Serial Port 1 signaling mode is RS-485

## IDS-310-AL Embedded System

### 4.3.3 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 6**) displays operating temperature and system voltages.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
-----
Advanced
-----
PC Health Status
System temperature           :+35 °C
CPU_CORE                    :+0.879 V
+5V                          :+4.961 V
+12V                        :+12.000 V
+DDR                         :+1.343 V
+5VSB                       :+4.961 V

Smart Fan Mode Select
-----
<=>: Select Screen
↑↓: Select Item
EnterSelect
+ - Change Opt.
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save & Exit
ESC Exit

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
    
```

#### BIOS Menu 6: iWDD H/W Monitor

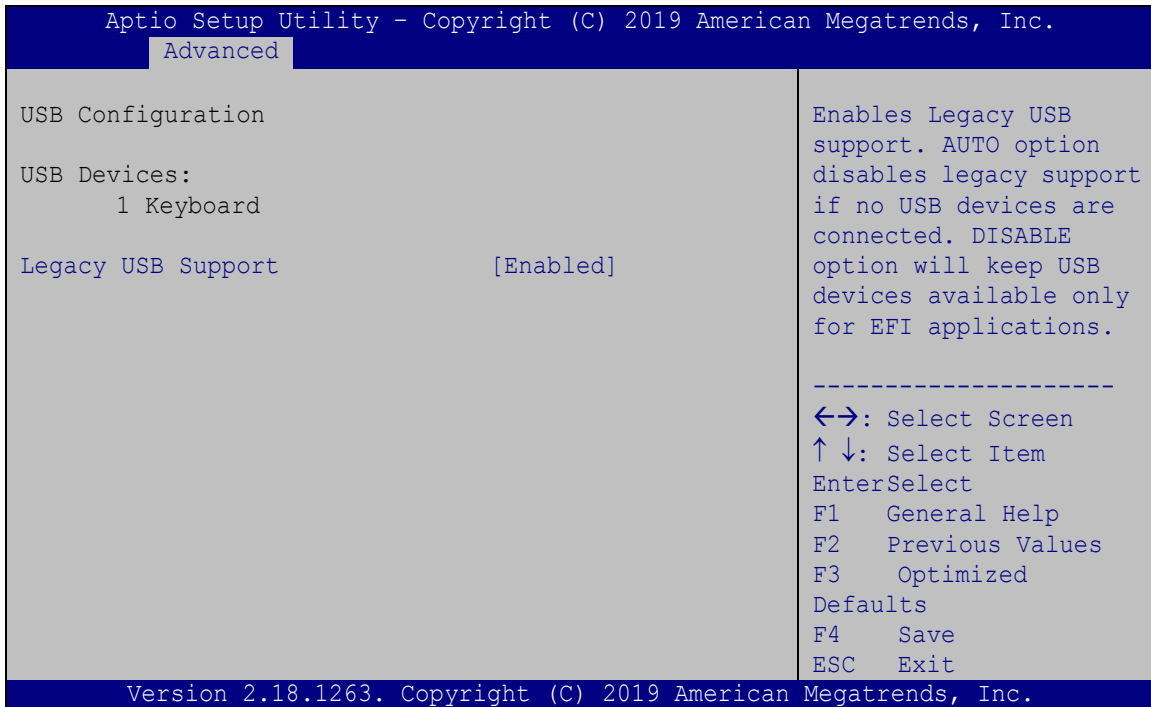
##### ➔ PC Health Status

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

- System Temperature
- Voltages
  - CPU\_CORE
  - +5V
  - +12V
  - +DDR
  - +5VSB

### 4.3.4 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 7**) to read USB configuration information and configure the USB settings.



#### BIOS Menu 7: USB Configuration

##### → USB Devices

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

##### → Legacy USB Support [Enabled]

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

→ **Enabled**    **DEFAULT**    Legacy USB support enabled



## IDS-310-AL Embedded System

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

### 4.3.5 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 8**) to view detailed CPU specifications and configure the CPU.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  Advanced
CPU Configuration
Intel(R) Celeron(R) CPU J3455 @ 1.50GHz
CPU Signature 506C9
Microcode Patch 38
Max CPU Speed 1500 MHz
Min CPU Speed 800 MHz
Processor Cores 4
Intel HT Technology Not Supported
Intel VT-x Technology Supported

L1 Data Cache 24 KB x 4
L1 Code Cache 32 KB x 4
L2 Cache 1024 KB x 2
L3 Cache Not Present

EIST [Enabled]
C-States [Enabled]
Intel Virtualization Technology [Enabled]
VT-d [Disabled]

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

-----
<->: Select Screen
↑ ↓: Select Item
Enter>Select
F1 General Help
F2 Previous Values
F3 Optimized
Defaults
F4 Save
ESC Exit

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
  
```

#### BIOS Menu 8: CPU Configuration

- ➔ **EIST [Enabled]**

Use the **EIST** option to enable or disable the Intel® Speed Step Technology.

- ➔ **Disabled** Disables the Intel® Speed Step Technology.
- ➔ **Enabled** **DEFAULT** Enables the Intel® Speed Step Technology.

**→ C-States [Enabled]**

Use the **C-States** option to enable or disable the C-states.

**→ Disabled** Disables the C-state

**→ Enabled** **DEFAULT** Enables the C-state

**→ 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.

**→ VT-d [Disabled]**

Use the **VT-d** BIOS option to enable or disabled VT-d support.

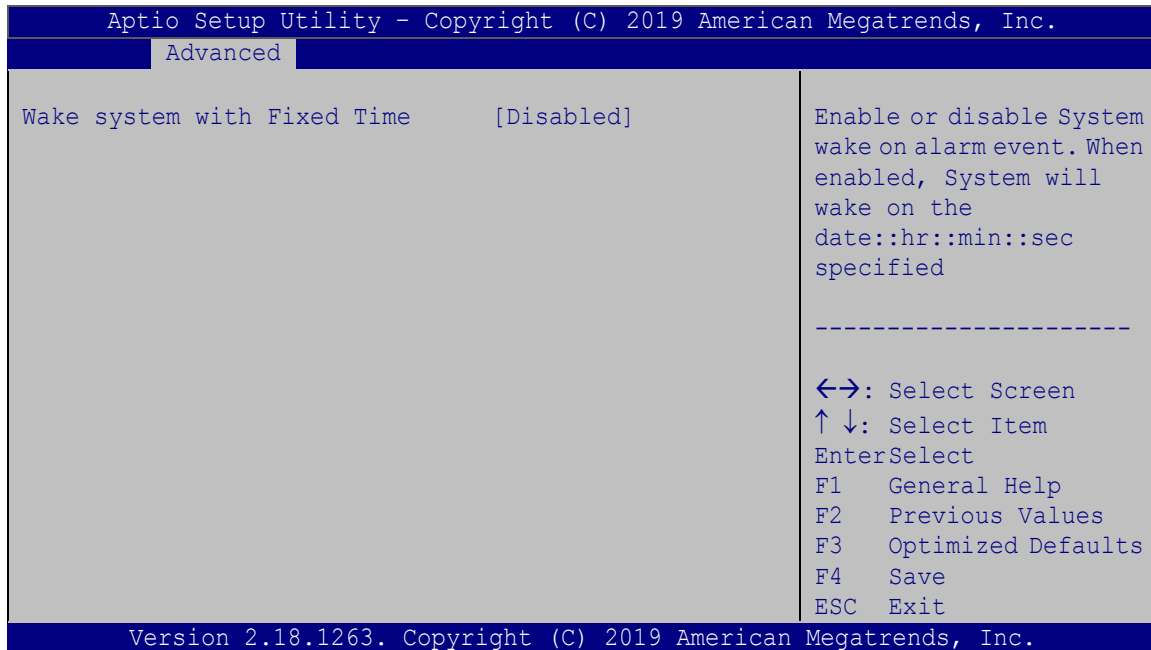
**→ Disabled** **DEFAULT** Disable VT-d support.

**→ Enabled** Enable VT-d support.

## IDS-310-AL Embedded System

### 4.3.6 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 9**) configures RTC wake event.



#### BIOS Menu 9: RTC Wake Settings

##### → Wake system with Fixed Time [Disabled]

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

- **Disabled**      **DEFAULT**      The real time clock (RTC) cannot generate a wake event
- **Enabled**      If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

Wake up date

Wake up hour

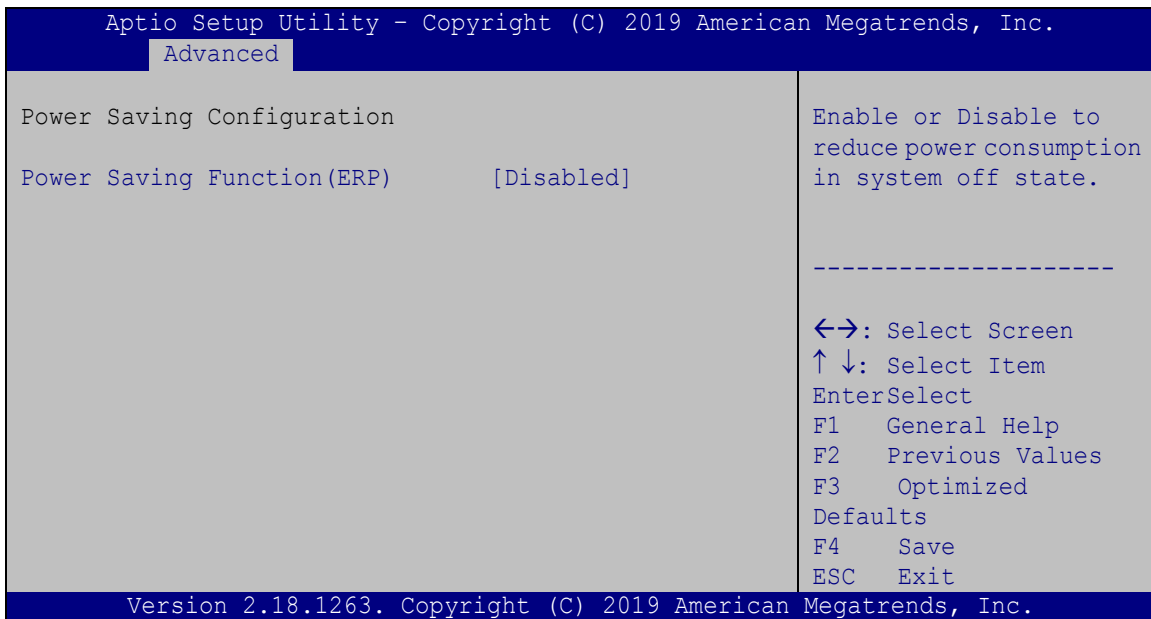
Wake up minute

Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

### 4.3.7 Power Saving Configuration

Use the **Power Saving Configuration** menu (**BIOS Menu 10**) to configure system to reduce power consumption in system off state.



#### BIOS Menu 10: Power Saving Configuration

##### → Power Saving Function(ERP) [Disabled]

Use the **Power Saving Function** BIOS option to enable or disable the power saving function.

- **Disabled**      **DEFAULT**      Power saving function is disabled.
- **Enabled**      Power saving function is enabled. It will reduce power consumption when the system is off.

## IDS-310-AL Embedded System

### 4.3.8 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 11**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  Advanced
COM1
  Console Redirection [Disabled]
  > Console Redirection Settings
  Legacy Console Redirection
  > Legacy Console Redirection Settings
  Console Redirection
  Enable or Disable
-----
<=>: Select Screen
↑↓: Select Item
Enter>Select
F1  General Help
F2  Previous Values
F3  Optimized
Defaults
F4  Save
ESC Exit
Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
  
```

#### BIOS Menu 11: Serial Port Console Redirection

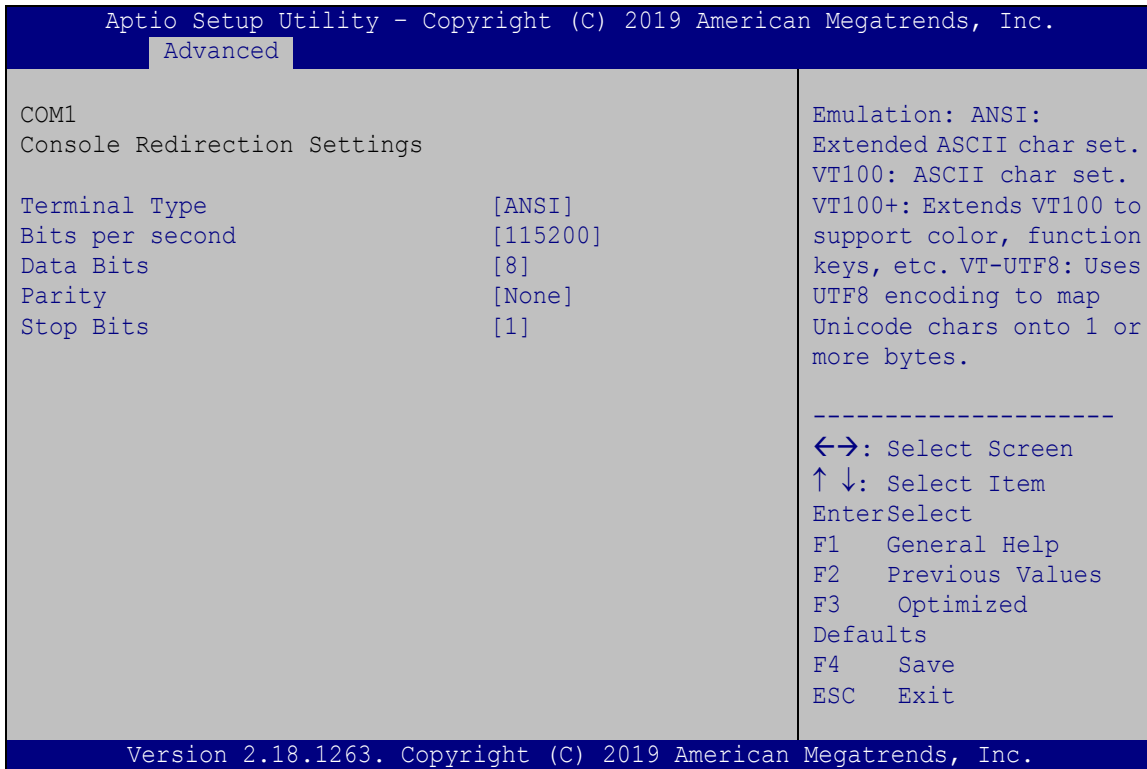
##### → Console Redirection [Disabled]

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

- **Disabled**    **DEFAULT**    Disabled the console redirection function
- **Enabled**                    Enabled the console redirection function

### 4.3.8.1 Console Redirection Settings

The **Console Redirection Settings** menu (**BIOS Menu 12**) allows the console redirection options to be configured. The option is active when Console Redirection option is enabled.



#### BIOS Menu 12: Console Redirection Settings

##### ➔ Terminal Type [ANSI]

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

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

## IDS-310-AL Embedded System

### → Bits per second [115200]

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

- |   |               |                |  |
|---|---------------|----------------|--|
| → | <b>9600</b>   |                | Sets the serial port transmission speed at 9600.   |
| → | <b>19200</b>  |                | Sets the serial port transmission speed at 19200.  |
| → | <b>38400</b>  |                | Sets the serial port transmission speed at 38400.  |
| → | <b>57600</b>  |                | Sets the serial port transmission speed at 57600.  |
| → | <b>115200</b> | <b>DEFAULT</b> | Sets the serial port transmission speed at 115200. |

### → Data Bits [8]

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

- |   |          |                |                          |
|---|----------|----------------|--------------------------|
| → | <b>7</b> |                | Sets the data bits at 7. |
| → | <b>8</b> | <b>DEFAULT</b> | Sets the data bits at 8. |

### → Parity [None]

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

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

### → Stop Bits [1]

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

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

### 4.3.8.2 Legacy Console Redirection Settings

The **Legacy Console Redirection Settings** menu (**BIOS Menu 13**) allows the legacy console redirection options to be configured.



#### BIOS Menu 13: Legacy Console Redirection Settings

### → Legacy Serial Redirection Port [COM1]

Use the **Legacy Serial Redirection Port** option to specify a COM port to display redirection of legacy OS and legacy OPROM messages. The options include:

- COM1                    **DEFAULT**



## IDS-310-AL Embedded System

### 4.3.9 IEI Feature

Use the **IEI Feature** menu (**BIOS Menu 14**) to configure One Key Recovery function.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
-----
Advanced
-----
iEi Feature
Auto Recovery Function      [Disabled]

Auto Recovery Function      Auto Recovery Function
                           Reboot and recover
                           system automatically
                           within 10 min, when OS
                           crashes. Please install
                           Auto Recovery API
                           service before enabling
                           this function

                           -----

                           ←→: Select Screen
                           ↑↓: Select Item
                           Enter>Select
                           F1   General Help
                           F2   Previous Values
                           F3   Optimized Defaults
                           F4   Save
                           ESC  Exit

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```

#### BIOS Menu 14: IEI Feature

##### → Auto Recovery Function [Disabled]

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

- **Disabled**      **DEFAULT**      Auto recovery function disabled
- **Enabled**        Auto recovery function enabled

## 4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 15**) to access the north bridge and south bridge configuration menus



### **WARNING!**

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

```
Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
Main   Advanced  Chipset  Security  Boot   Save & Exit

> North Bridge
> South Bridge

North Bridge Parameters

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

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
```

**BIOS Menu 15: Chipset**

## IDS-310-AL Embedded System

### 4.4.1 North Bridge Configuration

Use the **North Bridge Configuration** menu (**BIOS Menu 16**) to configure the Intel IGD settings.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
Chipset
> Intel IGD Configuration
> LCD Control

Memory Information
Total Memory          4096 MB (DDR3L)
DIMM1                 4096 MB (DDR3L)

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

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
  
```

#### BIOS Menu 16: North Bridge Configuration

#### 4.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** menu (**BIOS Menu 17**) to configure the video device connected to the system.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
Chipset
Intel IGD Configuration
Primary Display          [IGD]
DVMT Pre-Allocated      [256M]
DVMT Total Gfx Mem      [Max]

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

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
  
```

#### BIOS Menu 17: Intel IGD Configuration

**→ Primary Display [IGD]**

Use the **Primary Display** option to select the display device used by the system when it boots.

- IGD                   **DEFAULT**
- PCIe

**→ DVMT Pre-Allocated [256MB]**

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:

- 64M
- 128M
- 256M               **DEFAULT**
- 512M

**→ DVMT Total Gfx Mem [MAX]**

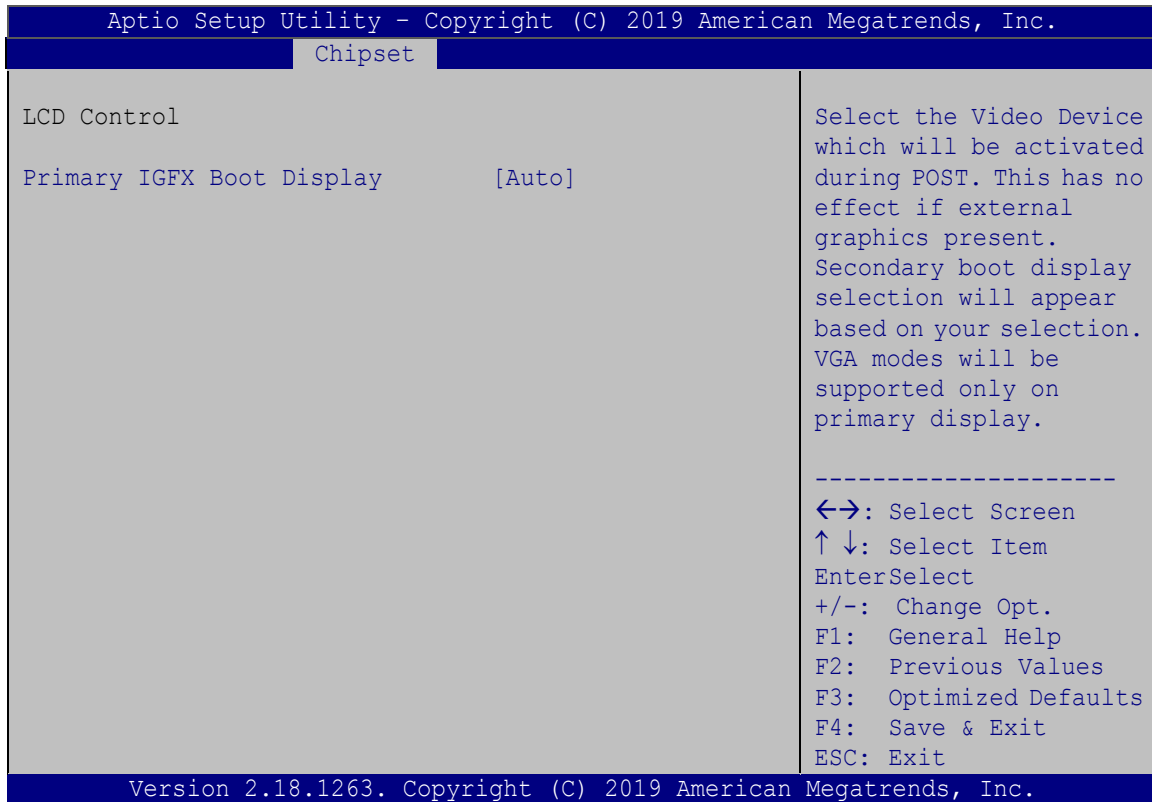
Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128MB
- 256MB
- MAX               **DEFAULT**

## IDS-310-AL Embedded System

### 4.4.1.2 LCD Control

Use the **LCD Control** submenu (**BIOS Menu 18**) to select a display device which will be activated during POST.



#### BIOS Menu 18: LCD Control

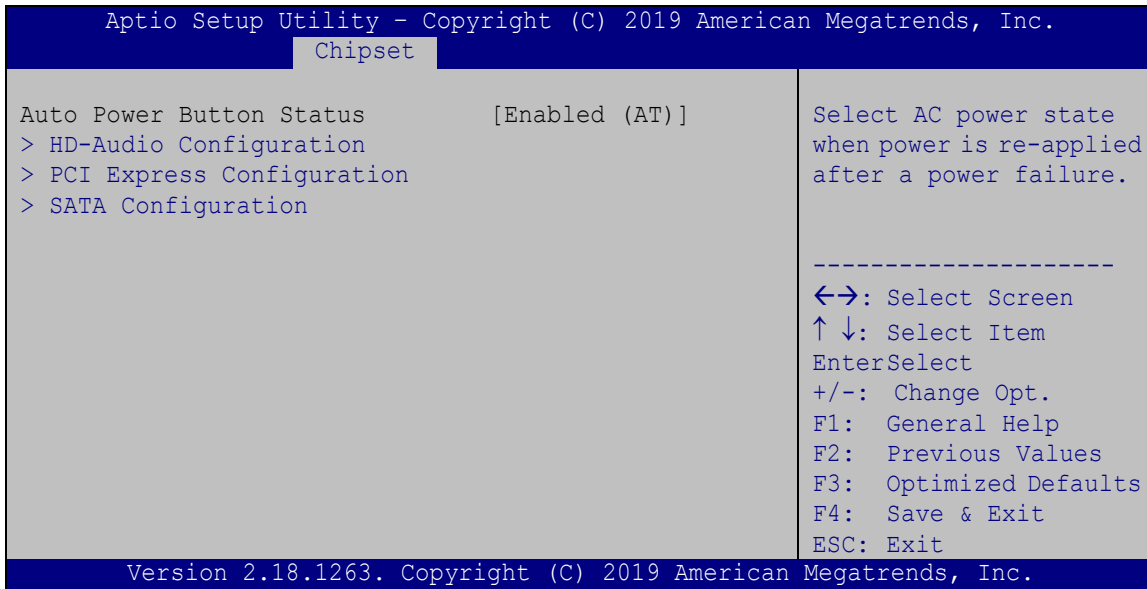
##### → Primary IGFX Boot Display [Auto]

Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots.

- Auto **DEFAULT**
- HDMI1
- HDMI2
- HDMI3

### 4.4.2 South Bridge Configuration

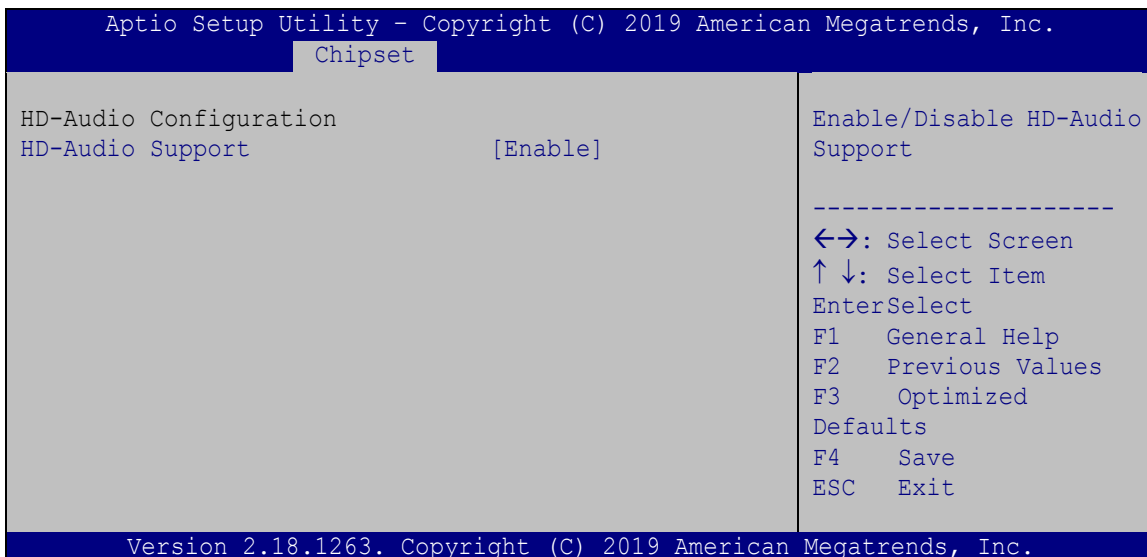
Use the **South Bridge Configuration** menu (**BIOS Menu 19**) to configure the south bridge chipset.



**BIOS Menu 19: South Bridge Configuration**

#### 4.4.2.1 HD-Audio Configuration

Use the **HD-Audio Configuration** submenu (**BIOS Menu 20**) to configure the HD Audio.



**BIOS Menu 20: HD-Audio Configuration**

## IDS-310-AL Embedded System

### → HD-Audio Support [Enable]

Use the **HD-Audio Support** option to enable or disable the High Definition Audio controller.

- **Disable**                      The onboard High Definition Audio controller is disabled
- **Enable**      **DEFAULT**      The onboard High Definition Audio controller is detected automatically and enabled

### 4.4.2.2 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 21**) to configure the PCI Express.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  Advanced
PCI Express Configuration
> Onboard LAN1
> Onboard LAN2
> M2_KEYA1
> MPCIE1

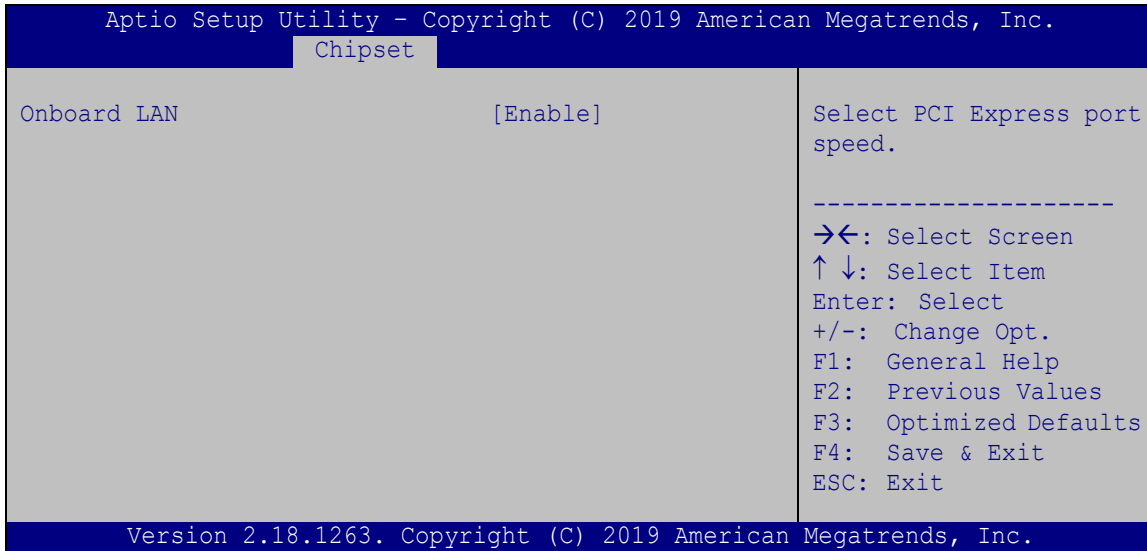
Configure PCIe Speed.
CHV A1 always with Gen1
Speed.

-----
←→: Select Screen
↑↓: Select Item
Enter>Select
F1   General Help
F2   Previous Values
F3   Optimized
Defaults
F4   Save
ESC  Exit

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
  
```

**BIOS Menu 21: PCI Express Configuration**

**4.4.2.2.1 Onboard LAN1/LAN2**



**BIOS Menu 22: Onboard LAN1/LAN2**

→ **Onboard LAN1/LAN2 [Enable]**

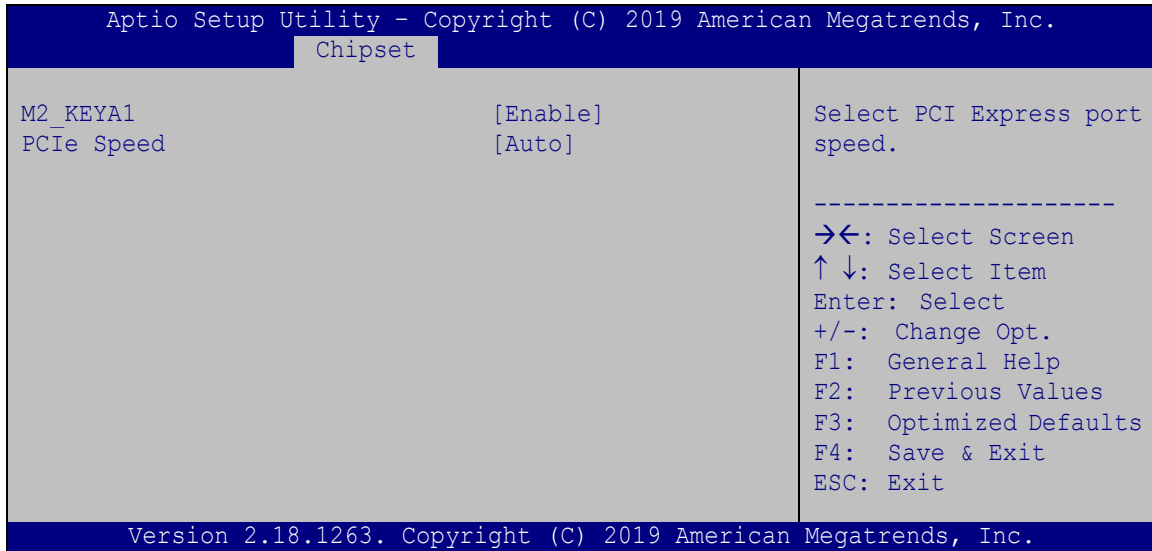
Use the **Onboard LAN1/LAN2** option to enable or disable the LAN connector.

- **Disable**                      The LAN1/LAN2 connector is disabled
- **Enable**      **DEFAULT**      The LAN1/LAN2 connector is enabled
- **Auto**                              The LAN connector unused is disabled automatically for the most optimum power savings



## IDS-310-AL Embedded System

### 4.4.2.2.2 M2\_KEYA1



#### BIOS Menu 23: M2\_KEYA1

##### → M2\_KEYA1 [Enable]

Use the **M2\_KEYA1** option to enable or disable the M.2 A-key slot.

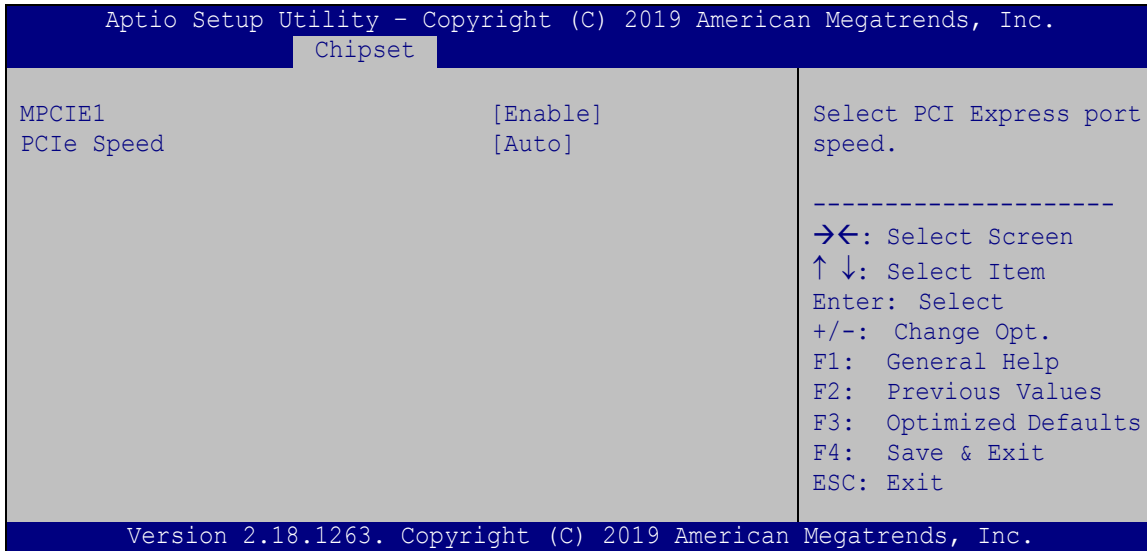
- **Disable**                      The M.2 A-key slot is disabled
- **Enable**      **DEFAULT**      The M.2 A-key slot is enabled
- **Auto**                              The M.2 A-key slot unused is disabled automatically for the most optimum power savings

##### → PCIe Speed [Auto]

Use this option to select the support type of the PCI Express slot. The following options are available:

- Auto                      **Default**
- Gen1
- Gen2

**4.4.2.2.3 MPCIE1**



**BIOS Menu 24: MPCIE1**

→ **MPCIE1 [Enable]**

Use the **MPCIE1** option to enable or disable the PCIe Mini slot.

- **Disable**                      The PCIe Mini slot is disabled
- **Enable**      **DEFAULT**      The PCIe Mini slot is enabled
- **Auto**                              The PCIe Mini slot unused is disabled automatically for the most optimum power savings

→ **PCIe Speed [Auto]**

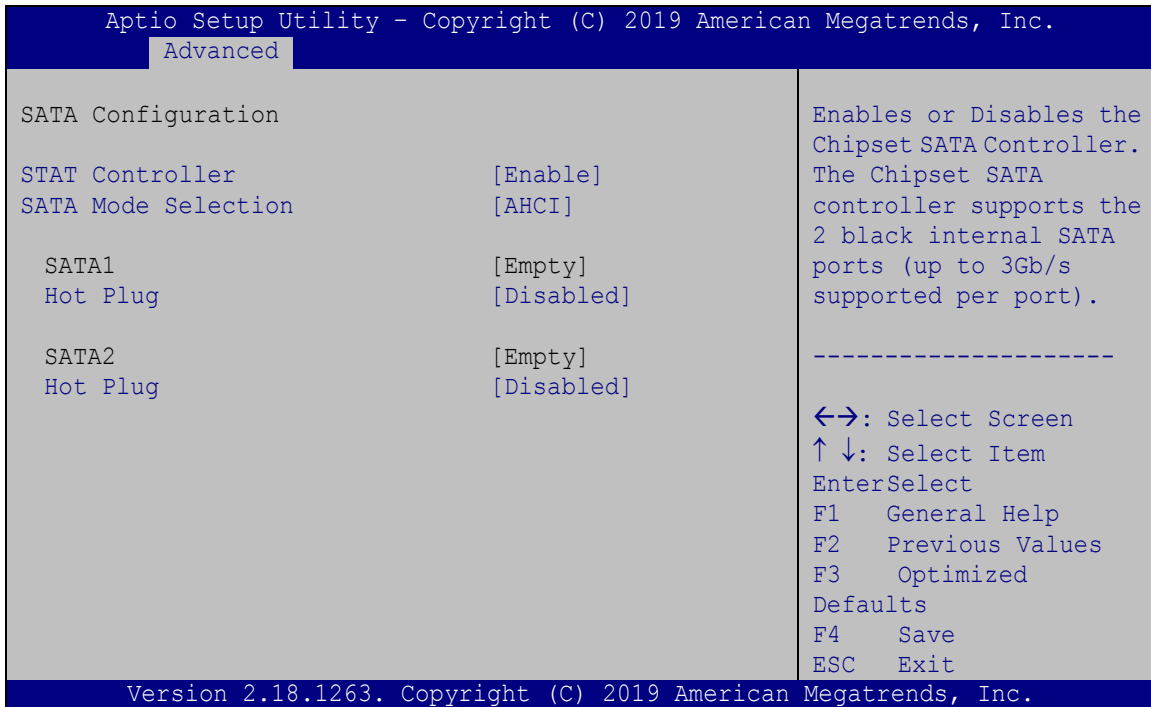
Use this option to select the support type of the PCI Express slot. The following options are available:

- Auto                      **Default**
- Gen1
- Gen2

## IDS-310-AL Embedded System

### 4.4.2.3 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 25**) to change and/or set the configuration of the SATA devices installed in the system.



#### BIOS Menu 25: SATA Configuration

##### → SATA Controller [Enable]

Use the **SATA Controller** option to enable or disable the SATA device.

- **Enable**      **DEFAULT**      Enables the SATA device.
- **Disable**           Disables the SATA device.

##### → SATA Mode Selection [AHCI]

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

- **AHCI**      **DEFAULT**      Configures SATA device as AHCI device.

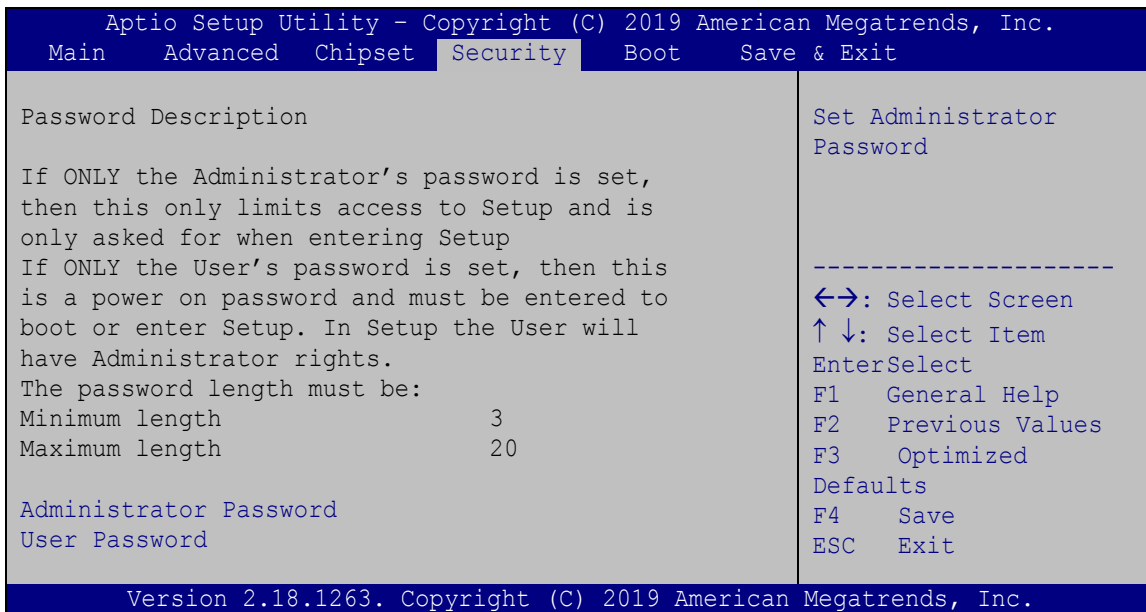
➔ **Hot Plug [Disabled]**

Use the **Hot Plug** option to enable or disable the SATA device hot plug.

- ➔ **Disabled**      **DEFAULT**      Disables the SATA device hot plug.
- ➔ **Enabled**                              Enables the SATA device hot plug

## 4.5 Security

Use the **Security** menu (**BIOS Menu 26**) to set system and user passwords.



**BIOS Menu 26: Security**

➔ **Administrator Password**

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

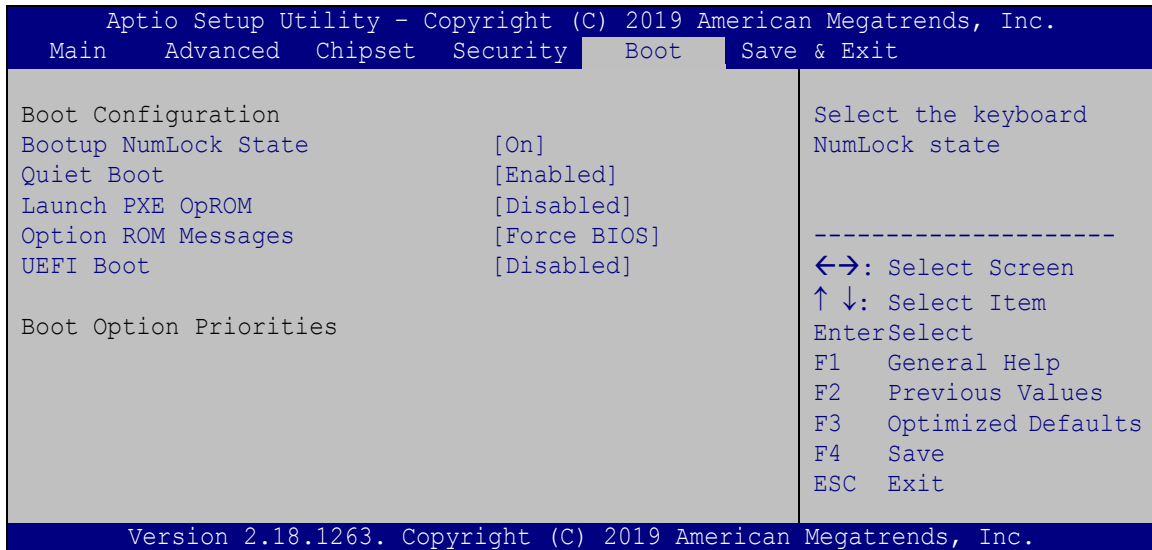
➔ **User Password**

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

## IDS-310-AL Embedded System

### 4.6 Boot

Use the **Boot** menu (**BIOS Menu 27**) to configure system boot options.



#### BIOS Menu 27: Boot

##### → Bootup NumLock State [On]

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

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

### → Quiet Boot [Enabled]

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

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

### → Launch PXE OpROM [Disabled]

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

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

### → Option ROM Messages [Force BIOS]

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

- **Force BIOS** **DEFAULT** Sets display mode to force BIOS.
- **Keep Current** Sets display mode to current.

### → UEFI Boot [Disabled]

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

- **Enabled** Enable UEFI boot if the 1<sup>st</sup> boot device is a GPT HDD.
- **Disabled** **DEFAULT** Disable UEFI boot.

### → Boot Option Priority

Use the **Boot Option Priority** function to set the system boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

## IDS-310-AL Embedded System

## 4.7 Save &amp; Exit

Use the **Exit** menu (**BIOS Menu 28**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit

Save Changes and Reset
Discard Changes and Reset

Restore Defaults
Save as User Defaults
Restore User Defaults

Reset the system after
saving the changes.

-----
<=>: Select Screen
↑ ↓: Select Item
Enter>Select
F1  General Help
F2  Previous Values
F3  Optimized
Defaults
F4  Save
ESC Exit

Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.

```

**BIOS Menu 28: Save & Exit****→ Save Changes and Reset**

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

**→ Discard Changes and Reset**

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

**→ Restore Defaults**

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

→ **Save as User Defaults**

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

→ **Restore User Defaults**

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



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 3.1**.

---

## 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-310-AL, 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-310-AL other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the IDS-310-AL from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to [sales@ieiworld.com](mailto:sales@ieiworld.com).

---

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

- SO-DIMM module

## IDS-310-AL Embedded System

- Wi-Fi module (see Section 3.4)

### 5.2.1 SO-DIMM Replacement



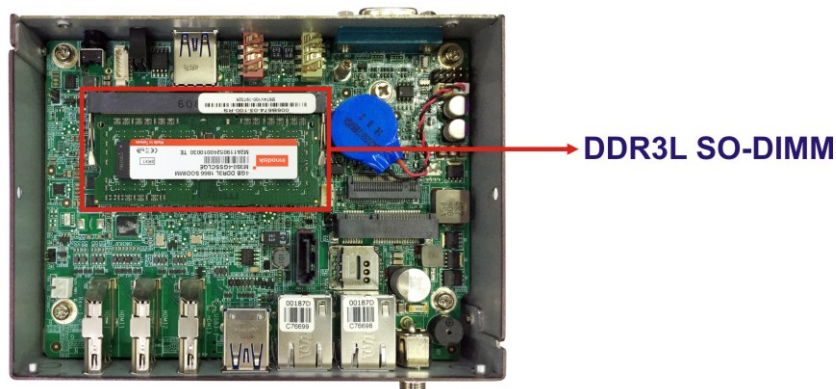
#### WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the IDS-310-AL. Please make sure the purchased SO-DIMM complies with the memory specifications of the IDS-310-AL.

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

**Step 1:** Remove the bottom surface. See **Section 3.3**.

**Step 2:** Locate the SO-DIMM inside the bottom panel (**Figure 5-1**).



**Figure 5-1: SO-DIMM Location**

**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 5-2**).

**Step 4:** Insert the SO-DIMM. Push the SO-DIMM chip into the socket at an angle (**Figure 5-2**).

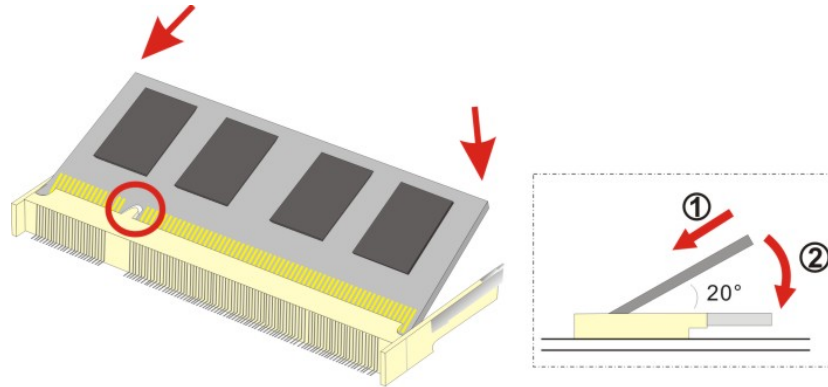


Figure 5-2: SO-DIMM Installation

**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

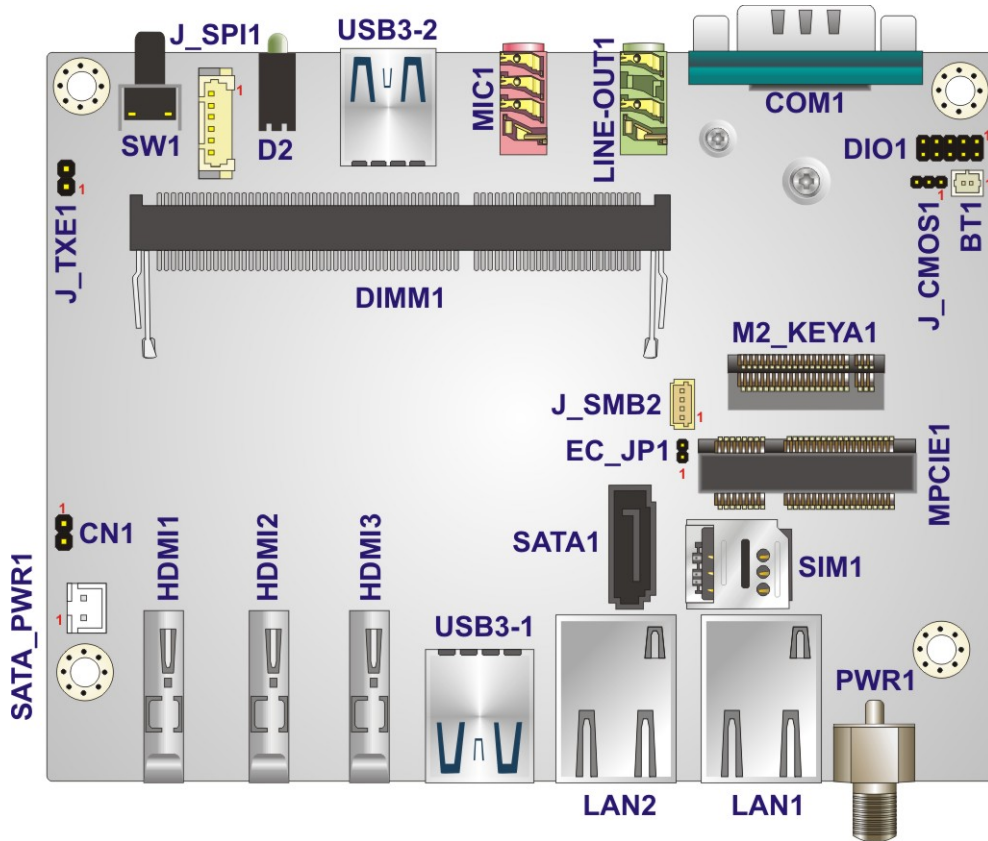
**6**

# Interface Connectors

---

## 6.1 Peripheral Interface Connectors

The IDS-310-AL 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**

## 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. Pinouts of the internal connectors listed in **Table 6-1** can be found in the following sections.

Connector	Type	Label
Battery connector	2-pin wafer	BT1
Digital I/O connector	10-pin header	DIO1
Firmware programming connector for CH7525	2-pin header	CN1
M.2 A-key slot	M.2 A-key 2230 slot	M2_KEYA1
PCIe Mini card slot	Full-size PCIe Mini slot	MPCIE1
SATA connector	7-pin connector	SATA1
SATA power connector	2-pin wafer	SATA_PWR1
SIM card slot	SIM slot	SIM1
SMBus connector	4-pin wafer	J_SMB2
SO-DIMM connector	SO-DIMM connector	DIMM1
SPI Flash connector, BIOS	6-pin wafer	J_SPI1
SPI Flash connector, EC	2-pin header	EC_JP1

**Table 6-1: Peripheral Interface Connectors**

### 6.2.1 Battery Connector (BT1)

PIN NO.	DESCRIPTION
1	VBATT
2	GND

**Table 6-2: Battery Connector (BT1) Pinouts**

**6.2.2 Digital I/O Connector (DIO1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	DOUT3	4	DOUT2
5	DOUT1	6	DOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

**Table 6-3: Digital I/O Connector (DIO1) Pinouts**

**6.2.3 Firmware Programming Connector for CH7525 (CN1)**

PIN NO.	DESCRIPTION
1	SMB_CLK_FW
2	SMB_DATA_FW

**Table 6-4: Firmware Programming Connector for CH7525 (CN1) Pinouts**

**6.2.4 M.2 A-key Slot (M2\_KEYA1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V3.3A
3	USB+	4	+V3.3A
5	USB-	6	NC
7	GND	8	Module Key
9	Module Key	10	Module Key
11	Module Key	12	Module Key
13	Module Key	14	Module Key
15	Module Key	16	NC
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	GND	24	GND



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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
25	NC	26	NC
27	NC	28	NC
29	GND	30	GND
31	NC	32	NC
33	GND	34	NC
35	PCIE_TX+	36	GND
37	PCIE_TX-	38	NC
39	GND	40	NC
41	PCIE_RX+	42	NC
43	PCIE_RX-	44	NC
45	GND	46	NC
47	CLK_PCIE+	48	NC
49	CLK_PCIE-	50	NC
51	GND	52	BUF_PLT_RST#
53	PCIE_CLKREQ#	54	Pull Up +V3.3A
55	PCIE_WAKE#	56	Pull Up +V3.3A
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	NC
71	NC	72	+V3.3A
73	NC	74	+V3.3A
75	GND		

**Table 6-5: M.2 A-key Slot (M2\_KEYA1) Pinouts**

**6.2.5 PCIe Mini Slot (MPCIE1)**

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	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	+3.3V
21	GND	22	PCIRST#
23	PERN (SATA_RX+)	24	+3VDual
25	PERP (SATA_RX-)	26	GND
27	GND	28	+1.5V
29	GND	30	SMBCLK
31	PETN (SATA_TX-)	32	SMBDATA
33	PETP (SATA_TX+)	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	+1.5V
49	N/C	50	GND
51	MSATA_SEL#	52	+3.3V

**Table 6-6: PCIe Mini Slot (MPCIE1) Pinouts**

## IDS-310-AL Embedded System

### 6.2.6 SATA Connector (SATA1)

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

**Table 6-7: SATA Connector (SATA1) Pinouts**

### 6.2.7 SATA Power Connector (SATA\_PWR1)

PIN NO.	DESCRIPTION
1	+5V
2	GND

**Table 6-8: SATA Power Connector (SATA\_PWR1) Pinouts**

### 6.2.8 SMBus Connector (J\_SMB2)

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

**Table 6-9: SMBus Connector (J\_SMB2) Pinouts**

### 6.2.9 SPI Flash Connector, BIOS (J\_SPI1)

PIN NO.	DESCRIPTION
1	+V3.3M_SPI_CON
2	SPI_CS
3	SPI_SO_SW
4	SPI_CLK_SW
5	SPI_SI_SW
6	GND

**Table 6-10: SPI Flash Connector (J\_SPI1) Pinouts**

### 6.2.10 SPI Flash Connector, EC (EC\_JP1)

PIN NO.	DESCRIPTION
1	SMB_CLK_FW
2	SMB_DATA_FW

**Table 6-11: SPI Flash Connector (EC\_JP1) Pinouts**

## 6.3 External Interface Panel Connectors

The table below lists the I/O panel connectors on the IDS-310-AL motherboard. Pinouts for these connectors can be found in **Section 3.8**.

Connector	Type	Label
Ethernet connectors	RJ-45	LAN1, LAN2
HDMI connectors	HDMI port	HDMI1, HDMI2, HDMI3
Power connector	4-pin DIN connector	PWR1
RS-232/422/485 connector	RJ-45	COM1
USB 3.2 Gen 1 connectors	USB Type A	USB3-1, USB3-2

**Table 6-12: External Interface Panel Connectors**

Appendix

**A**

# Regulatory Compliance

---

**DECLARATION OF CONFORMITY**

This equipment is in conformity with the following EU directives:

- EMC Directive (2004/108/EC, 2014/30/EU)
- Low-Voltage Directive (2006/95/EC, 2014/35/EU)
- RoHS II Directive (2011/65/EU, 2015/863/EU)
- Ecodesign Directive 2009/125/EC

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

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

---

English

IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

---

Български [Bulgarian]

IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложими правила на Директива 2014/53/EU.

---

Česky [Czech]

IEI Integration Corp tímto prohlašuje, že tento zařzení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 2014/53/EU.

---

Dansk [Danish]

IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 2014/53/EU

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Deutsch [German]

IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 2014/53/EU.

---

Eesti [Estonian]

IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 2014/53/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

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## IDS-310-AL Embedded System

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### Español [Spanish]

IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 2014/53/EU.

---

### Ελληνική [Greek]

IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 2014/53/EU.

---

### Français [French]

IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53/EU.

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### Italiano [Italian]

IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53/EU.

---

### Latviski [Latvian]

IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 2014/53/EU.

---

### Lietuvių [Lithuanian]

IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 2014/53/EU Direktyvos nuostatas.

---

### Nederlands [Dutch]

IEI Integration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 2014/53/EU.

---

### Malti [Maltese]

IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Direttiva 2014/53/EU.

---

### Magyar [Hungarian]

IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvető követelményeknek és az 2014/53/EU irányelvégyéb előírásainak.

---

### Polski [Polish]

IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 2014/53/EU.

---

### Português [Portuguese]

IEI Integration Corp declara que este equipamen está conforme com os requisitos essenciais e outras disposições da Directiva 2014/53/EU.

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Româna [Romanian]

IEI Integration Corp declară că acest echipament este în conformitate cu cerințele esențiale și cu celelalte prevederi relevante ale Directivei 2014/53/EU.

---

Slovensko [Slovenian]

IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 2014/53/EU.

---

Slovensky [Slovak]

IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 2014/53/EU.

---

Suomi [Finnish]

IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 2014/53/EU oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

---

Svenska [Swedish]

IEI Integration Corp förklarar att denna utrustningstyp står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/EU.

---



**FCC WARNING**

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

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

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**Federal Communication Commission Interference Statement**

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

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

Appendix

**B**

# Safety Precautions

---

**WARNING:**

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the IDS-310-AL.

## B.1 Safety Precautions

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

### B.1.1 General Safety Precautions

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

- **Follow the electrostatic precautions** outlined below whenever the device is opened.
- **Make sure the power is turned off and the power cord is disconnected** whenever the IDS-310-AL is being installed, moved or modified.
- **To prevent the risk of electric shock, make sure power cord is unplugged from wall socket.** To fully disengage the power to the unit, please disconnect the power cord from the AC outlet. Refer servicing to qualified service personnel. The AC outlet shall be readily available and accessible.
- **Do not apply voltage levels that exceed the specified voltage range.** Doing so may cause fire and/or an electrical shock. Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.
- **Electric shocks can occur** if the IDS-310-AL chassis is opened when it is running. To avoid risk of electric shock, this device must only be connected to a supply mains with protective earth.
- **Do not drop or insert any objects** into the ventilation openings of the IDS-310-AL.

- **If considerable amounts of dust, water, or fluids enter the device**, turn off the power supply immediately, unplug the power cord, and contact the IDS-310-AL vendor.
- **DO NOT:**
  - Drop the device against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

### B.1.2 Anti-static Precautions

---



#### **WARNING:**

Failure to take ESD precautions during the installation of the IDS-310-AL may result in permanent damage to the IDS-310-AL and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IDS-310-AL. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IDS-310-AL is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

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

## IDS-310-AL Embedded System

### B.1.3 Product Disposal

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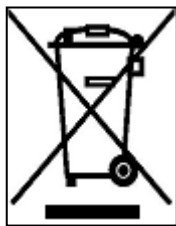
#### CAUTION:

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

Dispose of used batteries according to instructions and local regulations.

---

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



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

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

## B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the IDS-310-AL, please follow the guidelines below.



### WARNING:

- For safety reasons, turn-off the power and unplug the system before cleaning.
- If you dropped any material or liquid such as water onto the IDS-310-AL when cleaning, unplug the power cable immediately and contact your dealer or the nearest service center. Always make sure your hands are dry when unplugging the power cable.

### B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the IDS-310-AL, please read the details below.

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

### B.2.2 Cleaning Tools

Some components in the IDS-310-AL 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-310-AL.

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

## IDS-310-AL Embedded System

device 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 device. Dust and dirt can restrict the airflow in the device and cause its circuitry to corrode.
- **Cotton swabs** – Cotton swabs moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- **Foam swabs** – Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

**C**

# BIOS Menu Options

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## IDS-310-AL Embedded System

### C.1 BIOS Configuration Options

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

<input type="checkbox"/>	<b>System Date [xx/xx/xx]</b> .....	<b>36</b>
<input type="checkbox"/>	<b>System Time [xx:xx:xx]</b> .....	<b>36</b>
<input type="checkbox"/>	<b>ACPI Sleep State [S3 (Suspend to RAM)]</b> .....	<b>38</b>
<input type="checkbox"/>	<b>Serial Port [Enabled]</b> .....	<b>40</b>
<input type="checkbox"/>	<b>Change Settings [Auto]</b> .....	<b>40</b>
<input type="checkbox"/>	<b>Transfer Mode [RS232]</b> .....	<b>40</b>
<input type="checkbox"/>	<b>PC Health Status</b> .....	<b>41</b>
<input type="checkbox"/>	<b>USB Devices</b> .....	<b>42</b>
<input type="checkbox"/>	<b>Legacy USB Support [Enabled]</b> .....	<b>42</b>
<input type="checkbox"/>	<b>EIST [Enabled]</b> .....	<b>43</b>
<input type="checkbox"/>	<b>C-States [Enabled]</b> .....	<b>44</b>
<input type="checkbox"/>	<b>Intel® Virtualization Technology [Disabled]</b> .....	<b>44</b>
<input type="checkbox"/>	<b>VT-d [Disabled]</b> .....	<b>44</b>
<input type="checkbox"/>	<b>Wake system with Fixed Time [Disabled]</b> .....	<b>45</b>
<input type="checkbox"/>	<b>Power Saving Function(ERP) [Disabled]</b> .....	<b>46</b>
<input type="checkbox"/>	<b>Console Redirection [Disabled]</b> .....	<b>47</b>
<input type="checkbox"/>	<b>Terminal Type [ANSI]</b> .....	<b>48</b>
<input type="checkbox"/>	<b>Bits per second [115200]</b> .....	<b>49</b>
<input type="checkbox"/>	<b>Data Bits [8]</b> .....	<b>49</b>
<input type="checkbox"/>	<b>Parity [None]</b> .....	<b>49</b>
<input type="checkbox"/>	<b>Stop Bits [1]</b> .....	<b>50</b>
<input type="checkbox"/>	<b>Legacy Serial Redirection Port [COM1]</b> .....	<b>50</b>
<input type="checkbox"/>	<b>Auto Recovery Function [Disabled]</b> .....	<b>51</b>
<input type="checkbox"/>	<b>Primary Display [IGD]</b> .....	<b>54</b>
<input type="checkbox"/>	<b>DVMT Pre-Allocated [256MB]</b> .....	<b>54</b>
<input type="checkbox"/>	<b>DVMT Total Gfx Mem [MAX]</b> .....	<b>54</b>
<input type="checkbox"/>	<b>Primary IGFX Boot Display [Auto]</b> .....	<b>55</b>
<input type="checkbox"/>	<b>HD-Audio Support [Enable]</b> .....	<b>57</b>
<input type="checkbox"/>	<b>Onboard LAN1/LAN2 [Enable]</b> .....	<b>58</b>
<input type="checkbox"/>	<b>M2_KEYA1 [Enable]</b> .....	<b>59</b>
<input type="checkbox"/>	<b>PCIe Speed [Auto]</b> .....	<b>59</b>

<input type="checkbox"/> MPCIE1 [Enable] .....	60
<input type="checkbox"/> PCIe Speed [Auto].....	60
<input type="checkbox"/> SATA Controller [Enable].....	61
<input type="checkbox"/> SATA Mode Selection [AHCI].....	61
<input type="checkbox"/> Hot Plug [Disabled] .....	62
<input type="checkbox"/> Administrator Password .....	62
<input type="checkbox"/> User Password .....	62
<input type="checkbox"/> Bootup NumLock State [On].....	63
<input type="checkbox"/> Quiet Boot [Enabled] .....	64
<input type="checkbox"/> Launch PXE OpROM [Disabled] .....	64
<input type="checkbox"/> Option ROM Messages [Force BIOS].....	64
<input type="checkbox"/> UEFI Boot [Disabled] .....	64
<input type="checkbox"/> Boot Option Priority.....	64
<input type="checkbox"/> Save Changes and Reset .....	65
<input type="checkbox"/> Discard Changes and Reset .....	65
<input type="checkbox"/> Restore Defaults .....	65
<input type="checkbox"/> Save as User Defaults .....	66
<input type="checkbox"/> Restore User Defaults .....	66

Appendix

**D**

# Watchdog Timer

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**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:**

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

**Table D-1: AH-6FH Sub-function**

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. 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 ;
```

Appendix

**E**

# Error Beep Code

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## IDS-310-AL Embedded System

### E.1 PEI Beep Codes

Number of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXE IPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

### E.2 DXE Beep Codes

Number of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met



#### NOTE:

If you have any question, please contact IEI for further assistance.

Appendix

**F**

# Hazardous Materials Disclosure

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## IDS-310-AL Embedded System

### F.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements									
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	O	O	O	O	O	O
<p>O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863.</p> <p>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 Directive (EU) 2015/863.</p>										

## F.2 China RoHS

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

○: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11364-2014 與 GB/T26572-2011 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/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。