# **IH32 Motherboard**

3.5" SBC with Intel <sup>®</sup> 4<sup>th</sup> / 5<sup>th</sup> Generation Dual Core i5 Processors, HDMI, LVDS, VGA, Dual Giga Ethernet, and Mini-PCIe Interface

V110

# **User Manual**

Version 1.1 Manual Number: 9171111101X

# Preface

#### **Copyright Notice**

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#### Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. (Standard is one year, extended warranty will need to discuss with our sales representatives. If the customer discovers a defect, we will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e.g., with A for October, B for November and C for December).

For example, the serial number 1W11Axxxxxxx means October of year 2011.

#### Packing List

Before using this Motherboard, please make sure that all the items listed below are present in your package:

- IH32 Motherboard
- User Manual & Driver CD

**Optional Accessories:** 

Power Cord

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

#### **Customer Service**

We provide a service guide as below for any problem by the following steps:

First, contact your distributor, sales representative, or our customer service center for technical support if you need additional assistance. You need to prepare the following information before you call:

- Product serial number
- Peripheral attachments
- Software (OS, version, application software, etc.)
- Detailed problem description
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

#### **Safety Precautions**

#### • Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronic personnel should open the PC chassis.

#### Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

#### Safety and Warranty

- 1. Please read these safety instructions carefully.
- 2. Please keep this user manual for later reference.
- 3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
- 4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
- 5. Keep this equipment away from humidity.
- 6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- 7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- 8. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
- 9. All cautions and warnings on the equipment should be noted.
- 10. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
- 11. If any of the following situations arises, get the equipment checked by service personnel:
  - A. The power cord or plug is damaged.
  - B. Liquid has penetrated into the equipment.
  - C. The equipment has been exposed to moisture.
  - D. The equipment does not work well, or you cannot get it to work according to the user's manual.
  - E. The equipment has been dropped and damaged.
  - F. The equipment has obvious signs of breakage.

# **Revision History**

Version	Date	Note	Author
1.0	2015.02.24	Initial Draft	Patrick Hsien
1.1	2015.12.15	<ul> <li>Added:</li> <li>Intel<sup>®</sup> Core i5-5200U Dual Core 2.2GHz (up to 2.7GHz) Processor;</li> <li>Intel HD Graphics 5500, support DX11.2</li> <li>Corrected:</li> <li>Pin Assignment- Dc_In (CN22), VGA1</li> <li>Updated:</li> <li>BIOS Configurations</li> </ul>	Patrick Hsien, edited by Anna Kiseleva

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# **General Information**

This chapter includes the IH32 Motherboard background information.

Sections include:

1.1 Introduction

1.2 Features

1.3 Motherboard Specifications



# **Chapter 1 General Information**

#### 1.1 Introduction

Thank you for choosing the IH 32 motherboard. This motherboard can be integrated with Intel® Core i5-4200U Dual Core 1.6GHz (up to 2.6GHz) or Intel® Core i5-5200U Dual Core 2.2GHz (up to 2.7GHz) which offers a high performance computing platform with low power consumption. The new motherboard supports 204-pin SO-DIMM DDR3L at speeds of 1333/1600 MHz, up to 8GB. This motherboard support two generations of Intel® Core™ processors: Intel®4th Generation Core™ based on 64-bit, multi-core processor and built on 22-nanometer process technology, or Intel®5th Generation Core™ based on 64-bit, multi-core processor and built on 14-nanometer process technology.

There is an advanced full set of I/O ports including four USB 3.0, two USB 2.0, two LAN ports and audio jack for microphone, line-in and line-out. The motherboard is designed in 3.5" form factor and measures 146mm x 102mm.

#### 1.2 Features

- 3.5" Form Factor (146mm x 102mm / 5.7 x 4 inches)
- Supports:
  - Intel<sup>®</sup> 4th Generation Core i5 4200U Processor
  - Intel<sup>®</sup> 5th Generation Core i5 5200U Processor
- System memory up to 8GB DDR3L 1333/1600, SO-DIMM
- Supports:
  - Intel<sup>®</sup> HD Graphics 4400 Integrated Graphics Engine
  - Intel<sup>®</sup> HD Graphics 5500 Integrated Graphics Engine
- Intel<sup>®</sup> I211 Gigabit-LAN Controller + I218LM Gigabit-LAN PHY r
- 2 x Mini PCIe, 4 x COM, 4 x USB3.0, 2 x USB 2.0, 2 x SATAIII, 1 x 12 bit GPIO port, 1 x HDMI, 1xVGA

# **1.3** Motherboard Specifications

Please refer to the table below for detailed motherboard specifications.

	Supports Intel <sup>®</sup> 4th Generation Core 15 42000 1.6GHz					
CPU Type	Processor (up to 2.6GHz)					
//	Supports Intel <sup>®</sup> 5th Generation Core i5 5200U 2.2GHz					
	Processor (up to 2.7GHz)					
Chipset	Intel <sup>®</sup> SoC Integrated					
BIOS	AMI System BIOS					
Graphics	Intel <sup>®</sup> HD Graphics 4400 support DX11					
Chapmes	Intel HD Graphics 5500 support DX 11.2					
LCD interface	Dual-channel 24 bit LVDS Up to 1920 x 1200@ 60Hz					
	VGA mode: up to 1920 x 1200 @ 60Hz					
Resolution	HDMI: 1920 x 1200 @ 60Hz					
	LVDS: 1920 x 1200 @ 60Hz					
Multiple Display	VGA+LVDS+HDMI					
	2 x Giga LAN (Intel <sup>®</sup> I211 Gigabit-LAN Controller + I218LM					
LAN	Gigabit-LAN PHY )					
Memory Type	1x SO-DIMM socket, supports up to 8GB DDR3L 1333/1600					
Sound	Realtek ALC886 HD Audio Codec					
LICP	4 ports, USB 3.0 (2 x USB Connectors, 2 x USB pin-headers )					
2 ports, USB 2.0 (2 x USB pin-headers)						
	1 x DC-IN Jack (+12V)					
	2 x Gigabit LAN RJ-45					
I/O Connectors	1 x RS232/ 422/ 485					
	2 x USB 3.0 connector					
	1 x HDMI					
	3 x RS-232 (COM2.COM3.COM4) 2x5 pin-header					
	2x USB 2.0					
	2 x USB3.0 (2 x 10 Pin Header)					
	1 x LVDS by DF-13 40-pin connector					
	1 x 10-pin (2x5) water for VGA					
	2 x SATA III					
	1 x 2x4-pin water for SAIA power					
On Board	2 x 2- pin-header for speaker (with Amplifier): Left, Right					
Pin-Header	1 x 10-pin pin-neader for DIO					
Connectors	1 x 3-pin digital panel backlight brightness controller					
	1 x /-pin inverter					
	1 x 2-pin water for 5.3V external power (Blue)					
	1 x 2-pin water for +5V external newer (Pad)					
	1 x 2-pin water for 12)/ external power (Keu)					
	1 x 2-pin water for CDU Ean (smart fan)					
	1 x 10-nin header for VGA (2x5)					
	1 x 2x6-pin wafer for Audio (Mic-in / Line-in / Line-out)					
Power Connector	1 x 2.5 DC-in 12V connector					
	1 x Mini PCIe Slot for wireless or 3G Card(USB Signal).					
Expansion Slots	1 x Mini PCIe Slot for mSATA SSD(SATAIII Signal)					
Form Factor	3.5 inch					
Dimensions	146mm x 102mm					
	Operating Temperature: -10~70°C (14~158°F)					
Environmental	Operating Humidity: 10~90% relative humidity. non-condensing					
	Requirements: RoHS					

#### Function block (V110)



4

#### Board dimensions (V110)





# Hardware Installation

This chapter provides information on how to use jumpers and connectors on the IH32 Motherboard. Be cautious while working with these modules. Please carefully read the content of this chapter in order to avoid any damages.



The sections include:

- 2.1 Memory Module (SO-DIMM) Installation
- 2.2 I / O Equipment Installation
- 2.3 Jumpers and Connectors
- 2.4 Jumper Settings
- 2.5 Connectors and Pin Assignment

# **Chapter 2 Hardware Installation**

#### 2.1 Memory Module (SO-DIMM) Installation

The IH32 Motherboard has two 204-pin SODIMM slot. The socket supports up to 8GB DDR3L 1333/1600 SDRAM. When installing the memory unit, please follow the steps below:

**Steps 1** Firmly insert the SO-DIMM at an angle of about 30-degree into the slot. Align the SO-DIMM with the slot until it is fully inserted. The notch on the SO-DIMM should match the break on the slot.

**Step 2** Press downwards on SO-DIMM until the retaining clips at both ends fully snap closed and the SO-DIMM is properly seated.





The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the development board and the SO-DIMM if SO-DIMM is forced into the slot at the incorrect orientation.

**Caution!** 

#### 2.2 I/O Equipment Installation

#### 2.2.1 12V DC-IN

The Motherboard allows plugging in 12V DC-IN jack on the board without another power module converter under power consumption by Intel<sup>®</sup>  $4^{th}$ / $5^{th}$  Generation Core i5 4200U/ 5200U Processor.

#### 2.2.2 Serial COM ports

Three RS-232 connectors build-in the rear I/O. One optional COM port supports RS-422/485. When an optional touch-screen ordered with PPC, serial COM port can be connected to a serial or an optional touch-screen. You can change serial COM port setting through <u>BIOS</u>.

#### 2.2.3 External HDMI

The Motherboard has one HDMI port that can be connected to an external LCD monitor by HDMI cable, and it also needs to be connected to the outlet by power cable. The HDMI connector is a standard 19-pin Type A connector.

#### 2.2.4 Ethernet interface

The Motherboard is equipped with Intel<sup>®</sup> I211 Gigabit-LAN Controller + I218LM Gigabit-LAN PHY which is fully compliant with the PCI 10/100/1000 Mbps Ethernet protocol. It is supported by major network operating systems. The Ethernet ports provide two standard RJ-45 jacks.

#### 2.2.5 USB ports

Six USB devices (four with pin headers) can be connected to the system through an adapter cable. Various adapters may come with USB ports. USB usually connected the external system. The USB ports support hot plug-in connection. Whatever, you should install the device driver before you use the device.

#### 2.2.6 Audio function

The Audio 7.1 channel capabilities are provided by a Realtek ALC886 chipset supporting digital audio outputs. The audio interface includes three jacks: line-in, line-out and mic-in.

# 2.3 Jumpers and Connectors

## 2.3.1 Component Side



# 2.3.2 Solder Side



DDR3L(DIMM1) 🔶

# 2.3.3 I/O Side



#### 2.4 Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.



A pair of needle nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

The jumper setting diagram is shown below. When the jumper cap is placed on both pins, the jumper is SHORT. The illustration below shows a 3-pin jumper; pins 1 and 2 are short. If you remove the jumper cap, the jumper is OPEN.



#### 2.4.1 Jumper List

The following table lists the function of each of the board's jumpers.

Label	Function	Note
JP1	Backlight Power Selector	2x3 header, pitch 2.0mm
JP2	Panel Power Selector	2x3 header, pitch 2.54mm
JP3	PWM/DC Mode Control Selector	2x3 header, pitch 2.0mm
JP4	VR/Chipset Control Selector	2x3 header, pitch 2.0mm
SW0	Clear CMOS	1x3 header, pitch 2.0mm

# 2.4.2 Setting Jumpers

## 2.4.2.1 JP1: Backlight Power Selector



Setting	Function	
1-3*	+5)/	
2-4*	٧CT	
3-5		
4-6	+12V	

\*Default

#### 2.4.2.2 JP2: Panel Power Select

3.3\0	olts	_5\	/olts	,	r	12\	/olts	
1 0	<b>2</b>	1 0	0	2	1	0	0	2
3 🔿	<ul> <li>● 4</li> </ul>	3 📀	•	4	3	0	0	4
5 0	06	5 0	0	6	5	•	•	6
Sett	ing				Fu	nctior	I	
1-2	2*				+	3.3V		
3-	4				-	+5V		
5-	6				+	-12V		

\*Default

#### 2.4.2.3 JP3: PWM/DC Mode Control Selector



#### \*Default

#### 2.4.2.4 JP4: VR/Chipset Control Selector



Setting	Function
1-3*	
2-4*	VR Control
3-5	
4-6	Chipset

\*Default

#### 2.4.2.5 SW0: Clear CMOS

Please follow the instructions below to change CMOS settings.



Step 1: To set the jumper to "clear" position, switch 1 to 0, 2 to N.Step 2: To set the jumper to "normal" position, switch 0 to 1, N to 2.

# 2.5 Connectors and Pin Assignment

# 2.5.1 Front Side Setting Description

Label	Function	Note
AUDIO1	AUDIO	2x6 wafer, pitch 2.0mm
BT1	RTC Battery	2P wafer, pitch 1.25 mm
CN5	Serial port (RS232)	2x5 header, pitch 2.0mm
CN6	Serial port (RS232)	2x5 header, pitch 2.0mm
CN7	Mini-PCIE	Mini-PCIe slot
CN10	Serial port (RS232)	2x5 header, pitch 2.0mm
CN12	GPIO	2x5 header, pitch 2.0mm
CN14	SATA Power	2x4 wafer, pitch 2.0mm
CN15	mSATA	Mini-PCIe slot
CN16	12V output	1x2 wafer, pitch 2.0 mm
CN17	5V output	1x2 wafer, pitch 2.0 mm
CN 18	3.3V output	1x2 wafer, pitch 2.0 mm
CN19	Backlight Control VR	1x3 wafer, pitch 2.0mm
CN20	Backlight	1x7 wafer, pitch 2.0 mm
CN21	USB 2.0 / USB 3.0	10x2 wafer, pitch 2.0mm
CN22	DC-In 2.5	1x2P wafer, pitch 3.96mm
CN27	Serial port (RS232)	2x5 header, pitch 2.0mm
CON1	LVDS	2x20 wafer, pitch 1.25mm
CPU_FAN1	CPU_FAN	3P wafer, pitch 2.54mm
DIMM1	DDR3L	204 pin, SODIMM slot
J5	R-Speaker out	1x2 wafer, pitch 2.0 mm
J6	L-Speaker out	1x2 wafer, pitch 2.0 mm

The table below shows the function of each of the board's connectors.

J8	DC In	1x4P wafer, pitch 2.0mm
Panel 1	OSD membrane control	2x5 wafer, pitch 2.0mm
SATA1	SATA	SATA connector
SATA2	SATA	SATA connector
USB3	Internal USB2.0	2x4 wafer, pitch 2.0mm
VGA1	VGA Signal	2x5 wafer, pitch 2.0mm

#### AUDIO1: Audio



Pin №	Name	Pin №	Name
1	LINE_OUT_R	2	LINE_OUT_L
3	+5V	4	GND
5	LINE_IN_R	6	LINE_IN_L
7	MIC_R	8	MIC_L
9	GND	10	LINE_OUT_JACK DET
11	MIC_JACK DET	12	LINE_IN_JACK DET

**BT1: RTC Battery** 



Pin №	Name	Pin №	Name
1	GND	2	+.3.3V

## CN5, CN6, CN27, CN10 Serial ports (RS232)



Pin №	Name	Pin №	Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	IO_PWR

Note: IO\_PWR: default is 5V option to 3.3V

#### CN7: Mini-PCIE



Pin №	Name	Pin №	Name
1	PCIE_WAKE#	2	+3.3V
3	NC	4	GND
5	Bluetooth_ENABLE	6	+1.5V
7	CLK_OE#	8	USIM_PWR
9	GND	10	USIM_DATA
11	PCIE_CLKM	12	USIM_CLOCK
13	PCIE_CLKP	14	USIM_RESET
15	GND	16	USIM_VPP
17	NC	18	GND
19	NC	20	Wireless_ENABLE
21	GND	22	PCIE_RESET
23	PCIE_RXM	24	+3.3V
25	PCIE_RXP	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TXM	32	SMB_DATA
33	PCIE_TXP	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	+3.3V	52	+3.3V

#### **CN12: GPI0**



Pin №	Name	Pin №	Name
1	GND	2	+5V
3	DOUT3	4	DOUT1
5	DOUT2	6	DOUT0
7	DINT3	8	DINT1
9	DINT2	10	DINT0

#### CN14: SATA Power



Pin №	Name	Pin №	Name
1	+12V	2	+12V
3	GND	4	GND
5	GND	6	GND
7	+5V	8	+5V

#### CN15: mSATA

$\bigcirc$	52 51

Pin №	Name	Pin №	Name
1	NC	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	SATA_RXP	24	+3.3V
25	SATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	NC
31	SATA_TXN	32	NC
33	SATA_TXP	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	SSD_LED	50	GND
51	NC	52	+3.3V

#### CN16: 12V Output



Pin №	Name
1	+12V
2	GND

#### CN17: 5V Output



Pin №	Name
1	+5V
2	GND

#### CN18: 3.3V output



Pin №	Name
1	+3.3V
2	GND

## CN19: Backlight Control VR



Pin №	Name	Pin №	Name
1	+5V	2	Black Light Control
3	GND		

#### CN20: Backlight



Pin №	Name	Pin №	Name
1	Backlight Power	2	Backlight Power
3	Backlight Power	4	GND
5	Brightness Adjust	6	GND
7	Backlight Enable		

Note: Please refer to <u>JP1</u> Setting to select Power Rating

#### CN21: USB 2.0 / USB 3.0



Pin №	Name	Pin №	Name
1	+5V	2	NC
3	USB3_P3_RX -	4	+5V
5	USB3_P3_RX +	6	USB3_P4_RX-
7	GND	8	USB3_P4_RX+
9	USB3_P3_TX-	10	GND
11	USB3_P3_TX+	12	USB3_P4_TX-
13	GND	14	USB3_P4_TX+
15	USB_P3_D-	16	GND
17	USB_P3_D+	18	USB_P4_D-
19	NC	20	USB_P4_D+

#### CN22: DC-In 2.5



Pin №	Name	Pin №	Name
1	DC_IN	2	GND
3*	GND		

\*Not visible for user





Pin №	Name	Pin №	Name
1	LCDVDD	2	LVDS0_TX0_N
3	LCDVDD	4	LVDS0_TX0_P
5	LCDVDD	6	LVDS0_TX1_N
7	GND	8	LVDS0_TX1_P
9	GND	10	LVDS0_TX2_N
11	GND	12	LVDS0_TX2_P
13	GND	14	LVDS0_CLK_N
15	GND	16	LVDS0_CLK_P
17	GND	18	LVDS0_TX3_N
19	GND	20	LVDS0_TX3_P
21	GND	22	LVDS1_TX0_N
23	GND	24	LVDS1_TX0_P
25	GND	26	LVDS1_TX1_N
27	GND	28	LVDS1_TX1_P
29	GND	30	LVDS1_TX2_N
31	GND	32	LVDS1_TX2_P
33	GND	34	LVDS1_CLK_N
35	GND	36	LVDS1_CLK_P
37	GND	38	LVDS1_TX3_N
39	GND	40	LVDS1_TX3_P

Note: Please refer to CON1 SETTING TO SELECT POWER RATING

## CPU\_FAN1: CPU FAN



Pin №	Name	Pin №	Name
1	GND	2	+12V
3	RPM_SENSE		

#### DIMM1: DDR3L



#### J5: R-Speaker Out



Pin №	Name
1	ROUT+
2	ROUT-

#### J6: L-Speaker Out



Pin №	Name
1	LOUT+
2	LOUT-

\_

#### J8: DC-In



Pin №	Name	Pin №	Name
1	+12V	2	+12V
3	GND	4	GND

#### Panel1: OSD Membrane Control



Pin №	Name	Pin №	Name
1	+5V	2	+3.3V
3	GND	4	SATA_LED#
5	PWRBTN#	6	GND
7	Backlight_ADJ+	8	FP_RST_N
9	Backlight_ADJ-	10	+5V

**NOTE:** Backlight\_ADJ+ / Backlight\_ADJ- are optinal functions

#### SATA1, SATA2: SATA



Pin №	Name	Pin №	Name
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		

#### Two USB3: Internal USB2.0



Pin №	Name	Pin №	Name
1	+5V	2	+5V
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND

## VGA1: VGA Signal



Pin №	Name	Pin №	Name
1	DDC_DATA	2	+5V
3	DDC_CLOCK	4	RED
5	Horizontal Sync	6	GREEN
7	Vertical Sync	8	BULE
9	GND	10	GND
# 2.5.2 I/O Settings Description

The table below lists each of I/O side board connectors and PIN assignment.

Label	Function	Note
COM1	Serial port (RS232/422/485)	D-Sub9 (Male)
DCJACK	DC JACK	2.5 DC Jack
HDMI	HDMI Signal	HDMI Type A
LAN1	Gigabit Ethernet	RJ45+LED
LAN2	Gigabit Ethernet	RJ45+LED
USB	USB 2.0 / USB 3.0	USB Type A

COM1: D-Sub 9 (Male)



Pin №	RS232	RS422	RS485
1	DCD	TxD-	D-
2	RXD	TxD+	D+
3	TXD	RxD+	NC
4	DTR	RxD-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	СТЅ	NC	NC
9	RI	NC	NC

Note: Refer to **BIOS** to change serial COM port settings

#### DCJACK: 2.5' DC Jack



Pin №	Name	Pin №	Name
1	DC_IN	2	GND

#### HDMI: HDMI Type A



Pin №	Name	Pin №	Name	
1	HDMI_DET	2	NC	
3	HDMI_D2P	4	GND	
5	HDMI_D2M	6	HDMI_D1P	
7	GND	8	HDMI_D1M	
9	HDMI_D0P	10	GND	
11	HDMI_D0M	12	HDMI_CLKP	
13	GND	14	HDMI_CLKM	
15	HDMI_CEC_OUT	16	GND	
17	DDC_CLOCK	18	DDC_DATA	
19	+5V	20	GND	

## LAN1/LAN2: Gigabit Ethernet



Pin №	Name	Pin №	Name
1	TX1+	2	TX1-
3	TX2+	4	TX2-
5	TX3+	6	TX3-
7	TX4+	8	TX4-

## Two USB 3.0 (Compliable with USB 2.0)



Pin №	Name	Pin №	Name
1	+5V	2	USB_D-
3	USB_D+	4	GND
5	STDA_SSRX-	6	STDA_SSRX+
7	GND_DRAIN	8	STDA_SSTX-
9	STDA_SSTX+	10	+5V
11	USB_D-	12	USB_D+
13	GND	14	STDA_SSRX-
15	STDA_SSRX+	16	GND
17	STDA_SSTX-	18	STDA_SSTX+

# AMI BIOS Setup

This chapter contains BIOS Configuration and OS Recovery information.

- 3.1 Instructions
- 3.2 BIOS Functions
- 3.3 Using Recovery Wizard to Restore Computer



# Chapter 3 AMI BIOS SETUP

#### 3.1 How and When to Use BIOS Setup

The BIOS Setup allows users to modify system configurations. To enter the BIOS setup, you need to connect an external USB keyboard, press Del key when the prompt appears on the screen during start up. The prompt screen shows only few seconds so need press Del key quickly.



Updated BIOS version may be published after the manual released.

#### Note

Check the latest version of BIOS on the website.

You may need to run BIOS setup utility for a reasons listed below:

- 1. Error message on sreen indicates to check BIOS setup
- 2. Restoring the factory default settings.
- 3. Modifing the specific hardware specifications
- 4. Necessity to optimize specifications

#### **BIOS Navigation Keys**

BIOS navigation keys for keyboard control are shown in the Table below.

Use the error keys to highlight the items.

Кеу	Function
Del	Enters the BIOS setup menu.
F7	Display the boot menu. Lists all bootable devices that are connected to the
	system. With cursor $\uparrow$ and cursor $\downarrow$ and by pressing <enter>, select the</enter>
	device used for the boot.
Pause	Pressing the [Pause] key stops the POST. Press any other key to resume the
	POST.

The following Keys can be used after entering the BIOS Setup.

Кеу	Function
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit
Esc	Exit
+/-	Change Opt.
Enter	Select or execute command
Cursor ↑	Moves to the previous item

Cursor ↓	Goes to the next item
Cursor $\leftarrow$	Moves to the previous item
Cursor $\rightarrow$	Goes to the next item

#### \*\*NOTICE

You can press the F1, F2, F3, F4, -/+, and Esc keys by connecting a USB keyboard to your Panel PC.

#### **3.2 BIOS Functions**

The IH32 motherboard has AMI BIOS built-in and a CMOS SETUP utility that allow users to configure required settings or to activate certain system features. The follwoing sections describe the configuration options found in the menu items.

#### 3.2.1 Main Menu

The Main menu displays the basic information about yoursystem including BIOS version, processor RC version, system language, time, and date.

When you enter BIOS setup, the first menu that appears on the screen is the main menu. It contains the system information including BIOS version, processor RC version, system language, time, and date.

	Aptio Setup Utility – Copyright (C) 2014 Americar	n Megatrends, Inc.
Main Advanced Chipset	: Boot Security Save & Exit	
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time	American Megatrends 4.6.5.4 UEFI 2.3.1; PI 1.2 IH32 V002 x64 11/05/2014 11:30:22	▲ Choose the system default language
Processor Information Name Brand String Frequency Processor ID Stepping Number of Processors Microcode Revision GT Info	Haswell ULT Intel(R) Core(TM) 15-4200U CPU @ 1.60GH: 1600 MHz 40651 C0 2Core(s) / 4Thread(s) 17 GT2 (400 MHz)	2
IGFX VBIOS Version Memory RC Version Total Memory Memory Frequency	2180 1.6.2.1 4096 MB (DDR3) 1600 Mhz	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt.
Name	LunxPoint-LP	F1: General Help F2: Previous Values
PCH SKU	Premium SKU	F3: Optimized Defaults
Stepping	04/B2	F4: Save & Exit
ME FW Version ME Firmware SKU	9.5.13.1706 SMB	ESC: Exit F4. Save a Exil ESC: Exit
System Language	[English]	
System Date System Time	[Wed 01/01/2014] [00:00:00]	
Access Level	Administrator	▼
	Version 2.15.1236, Copyright (C) 2014 American b	Megatrends, Inc.

<b>BIOS Setting</b>	Description	Setting Option Effect		
System	Displays the system	Adjustment of the	Set the language in	
Language	language. [English] is	language	other language. The	
	set up by default.		language in this	
			device is English.	
System	This is current date	Date and time	Set the date in the	
Date/Time	setting. The time is	changes.	format [mm/dd/yyyy];	
	maintained by the	The time in		
	battery when the		format:	
	device is turned off.	[hh/mm/ss]		
Access Level	The current user	Changes to the level Administrator is set u		
	access settings	of access	by the default	

#### 3.2.2 Advanced Settings

Select the Advanced Tab from the IH32 setup menu to enter the advanced BIOS setup screen. You can select any of the items on the left frame of the screen to go to the sub menu for the item, such as CPU Configuration. You can use the <Arrow> keys enter all advanced BIOS setup options. The advanced BIOS setup menu is shown below. The submenus described on the following pages.

affect the operation of your computer.



Handle advanced BIOS settings page with caution. Any changes can

Note



BIOS Setting	Description	Setting	Effect
		Option	
ACPI Settings	Configures ACPI settings	Enter	Opens submenu
RTC Wake Settings	Configures RTC Wake	Enter	Opens submenu
	parameters		
Trusted Computing	Configures Trusted	Enter	Opens submenu
	Computing parameters		
CPU Configuration	Configures CPU settings	Enter	Opens submenu
SATA Configuration	Configures SATA parameters	Enter	Opens submenu
Intel <sup>®</sup> Rapid Start	Configures Intel Rapid Start	Enter	Opens submenu
Technology	Technology parameters		
PCH-FW	Configures PCH-FW	Enter	Opens submenu
Configuration	parameters		
USB Configuration	Configures USB parameters	Enter	Opens submenu
F81866 H/W Monitor	Configures H/W Monitor	Enter	Opens submenu
	settings		
F81866 Super I/O	Configures Super I/O settings	Enter	Opens submenu
Configuration			
Intel Ethernet	Configures Intel Ethernet	Enter	Opens submenu
Connection	Connection settings		
Intel I211 Gigabit	Configures Intel I211 Gigabit	Enter	Opens submenu
Network Connection	Network Connection settings		

For items marked ► press **<Enter>** for more options.

#### 3.2.2.1 ACPI Settings

Aptio Advanced	Setup Utility – Copyright (C) 201	14 American Megatrends, Inc.
ACPI Settings		
Enable ACPI Auto Configuration	[Disabled]	
Enable Hibernation	[Enabled]	
		the Solast Senson
		14: Select Item Enter: Select
		+/-: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Vers	ion 2.15.1236. Copyright (C) 2014	American Megatrends, Inc.

<b>BIOS Setting</b>	Description	Setting Option	Effect
Enable ACPI	BIOS ACPI Auto	Enable/ Disable	Enables or
Auto	Configuration		Disables this
Configuration			function
Enable	Control hibernation	Enable/ Disable	Enables or
Hibernation			Disables this
			function

#### 3.2.2.2 RTC Wake

Advanced Apt	io Setup Utility – Copyright	(C) 2014 American Mega	trends, Inc.
Wake system with Fixed Time	[Disabled]		
Wake system with Dynamic Time	[Disabled]		
Wake system from S5 Wake system from S4	(Disabled) (Disabled)		
			the Salast Canaan
			11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
			LSG. EAIL
Ve	rsion 2.15.1236. Copyright (	C) 2014 American Megatr	ends, Inc.

BIOS Setting	Description	Setting Option	Effect
Wake system with	System awake on	Enabled/	System will
Fixed Time	alarm events.	Disabled	awake at the hr:
			min: sec
			specified
Wake system with	S set the system to	Enabled/	System will
Dynamic Time	wake on the current	Disabled	awake at current
	time + increase		time+ increase
	minute (s).		minute (s).
Wake System from	Enables or disables	Enabled/	System will
S5	system wake on alarm	Disabled	awake at the hr:
	event. It allows you to		min: sec
	wake up the system in		specified
	a certain time.		

#### 3.2.2.3 Trusted Computing

Advanced	Aptio Setup Utility – Copyright (C) 2014	American Megatrends, Inc.
Configuration Security Device Support TPM State Pending operation	[Enable] [Disabled] [None]	
Current Status Information TPM Enabled Status: TPM Active Status: TPM Owner Status:	[Disabled] [Deactivated] [Owned]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
	Version 2.15.1236. Copyright (C) 2014 Ar	merican Megatrends, Inc.

<b>BIOS Setting</b>	Description	Setting Option	Effect
Security Device	Enable or disable BIOS	Enabled/Disabled	Set desirable
Support	support for security device		configuration
TPM State	Enable or disable TPM	Enabled/Disabled	Set desirable
	state.		configuration

## 3.2.2.4 CPU Configuration

CPU Configuration allows you to change CPU settings. Use key arrows to navigate through the menu.

CPU Configuration       XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SF1, Windows WS SP2, SubE Linux 9.2, RedHat Enterprise 3 Update Min CPU Speed         Processor Family       6         Max CPU Speed       100 MHz         Max CPU Speed       100 MHz         Processor Cores       2         Intel IMT Technology       Supported         Intel YM Technology       Supported         CPU C3 state       Supported         CPU C3 state       Supported         L1 Data Cache       32 KB × 2         L2 Cache       256 KB × 2         L3 Cache       3072 KB         Execute Disable Bit       Enabled]         Intel Virtualization Technology       [Enabled]         Turbo Mode       [Disabled]         Execute Disable Bit       [Enabled]         CPU DTS       [Enabled]	Aptio Advanced	Setup Utility – Copyright (C) 2014 American Meg	atrends, Inc.
Intel(R) Core(TM) 15-4200U CPU # 1.60GHzImage: Control of the over 100 attends with the over 100	CPU Configuration		XD can prevent certain classes of
And Kill bold of a Hooding     40651       Processon Family     6       Microcode Patch     17       FSB Speed     100 MHz       Min CPU Speed     1600 MHz       Processon Cores     2       Intel SM Technology     Supported       Processon Cores     2       Intel SM Technology     Supported       GPU State     Supported       CPU CS state     Supported       CPU CS state     Supported       CPU CS state     Supported       L1 Data Cache     32 KB x 2       L3 Cache     30 Z KB       Execute Disable Bit     [Enabled]       Enterly     [Enabled]       Bot performance     [Performance]       EIST     [Enabled]       CPU OTS     [Disabled]       CPU OTS     [Disabled]	Intel(R) Core(IM) i5-4200U CPU @ 1	60GHz	combined with a supporting OS (Windows
Processor Family       6         Microcode Patch       17         F38 Speed       100 MHz         Max CPU Speed       1600 MHz         Max CPU Speed       1600 MHz         CPU Speed       1600 MHz         Processor Cores       2         Intel HT Technology       Supported         Intel YFX Technology       Supported         G4-bit       Supported         ELINX F2: Chonology       Supported         CPU C5 state       Supported         CPU C5 state       Supported         L1 Data Cache       32 KB x 2         L1 Code Cache       32 KB x 2         L2 Cache       25 KB k 2         L3 Gache       3072 KB         Execute Disable Bit       Innabled]         Intel Virtualization Technology       IEnabled]         Boot performance       IPerformance]         API CTPP BIOS       Disabled]         CPU DTS       Inabled]	CPU Signature	40651	Server 2003 SP1, Windows XP SP2, SuSE
Microcode Patch173.)F88 Speed100 HHzMax CPU Speed1600 HHzMin CPU Speed600 HHzProcessor Cores2Intel HT TechnologySupportedIntel NT TechnologySupportedIntel SK TechnologySupportedGPU C3 stateSupportedCPU C3 stateSupportedCPU C3 stateSupportedCPU C3 stateSupportedL1 Data Cache32 kB x 2L2 Cache256 kB x 2L3 Cache256 kB x 2L3 Cache256 kB x 2L3 Cache256 kB x 2L3 Cache16 mabled]Execute Disable BitEnabled]Encore made[Turbo Performance]EIST[Enabled]Turbo Mode[Disabled]ENdEnabled]Encore made[Performance]ACPU C4 Advice Cache (A cache)L3 CacheDisabled]Execute Disable Bit[Enabled]Encore made[Performance]EIST[Enabled]CPU DTS[Enabled]Encore Disabled][Enabled]Encore Disabled][Enabled]CPU DTS[Enabled]CPU DTS[Enabled]	Processor Family	6	Linux 9.2. RedHat Enterprise 3 Undate
FSB Speed       100 HHz         Max CPU Speed       1600 HHz         Min CPU Speed       1600 HHz         CPU Speed       1600 HHz         Processor Cores       2         Intel HT Technology       Supported         Intel YT-x Technology       Supported         Intel SMX Technology       Supported         CPU C3 state       Supported         CPU C3 state       Supported         CPU C3 state       Supported         CPU C4 state       Supported         L1 Data Cache       32 kB x 2         L1 Cache       32 kB x 2         L2 Cache       256 kB x 2         L3 Cache       307 kB         Execute Disable Bit       [Enabled]         Intel Virtualization Technology       [Enabled]         Boot performance mode       [Disabled]         ETST       [Enabled]         Turbo Mode       [Disabled]         Energy Performance       [Performance]         CPU DTS       [Enabled]	Microcode Patch	17	3.)
Max CPU Speed       1600 MHz         Min CPU Speed       000 MHz         Processor Cores       2         Intel HT Technology       Supported         Intel YT-x Technology       Not Supported         Intel SMX Technology       Not Supported         EIST Technology       Supported         CPU C3 state       Supported         CPU C4 state       Supported         CPU C4 state       Supported         L1 Data Cache       32 kB × 2         L2 Cache       32 kB × 2         L3 Cache       32 kB × 2         L4 Data Cache       32 kB × 2         L5 Cache       3072 kB         Execute Disable Bit       [Enabled]         Intel Virtualization Technology       [Enabled]         First       Eabled]         Boot performance       [Performance]         ETST       [Enabled]         CPU DTS       [Enabled]	FSB Speed	100 MHz	
Min CPU Speed       B00 MHz         CPU Speed       1600 MHz         Processor Cores       2         Intel HT Technology       Supported         Intel VT~× Technology       Supported         64-bit       Supported         64-bit       Supported         64-bit       Supported         CPU C3 state       Supported         L1 Data Cache       32 KB x 2         L1 Data Cache       32 KB x 2         L2 Cache       25 KB x 2         L3 Cache       3072 KB         Execute Disable Bit       [Enabled]         Intel Virtualization Technology       [Enabled]         East       [Pu obsequence]         CPU DTS       [Pabled]         CPU DTS       [Pabled]	Max CPU Speed	1600 MHz	
CPU Speed       1600 MHz         Processor Cores       2         Intel HT Technology       Supported         Intel VT-x Technology       Supported         Intel SMX Technology       Not Supported         64-bit       Supported         CPU C3 state       Supported         CPU C3 state       Supported         CPU C3 state       Supported         CPU C7 state       This Select Screen         11 Data Cache       32 kB x 2         11 Data Cache       32 kB x 2         12 Cache       256 kB x 2         12 Cache       256 kB x 2         13 Data Cache       372 kB         Execute Disable Bit       [Enabled]         Execute Disable Bit       [Enabled]         F4: Save & Exit       Supported Defaults         F4: Save & Exit       ESC: Exit         Boot performance mode       [Disabled]         EIST       [Enabled]         CPU DTS       [Disabled]         CPU DTS       [Enabled]	Min CPU Speed	800 MHz	
Processor Cores       2         Intel HT Technology       Supported         Intel VT-x Technology       Supported         Intel SWX Technology       Not Supported         64-bit       Supported         CPU C3 state       Supported         L1 Data Cache       32 kB x 2         L1 Code Cache       32 kB x 2         L2 Cache       32 kB x 2         L3 Cache       32 kB x 2         L3 Cache       3072 kB         Execute Disable Bit       Enabled]         Intel Virtualization Technology       Enabled]         Boot performance mode       [Turbo Performance]]         EIST       [Enabled]         CPU CT9 BIDS       [Disabled]         CPU DTS       [Enabled]	CPU Speed	1600 MHz	
Intel HT Technology       Supported         Intel VT-x Technology       Supported         Intel SKX Technology       Not Supported         64-bit       Supported         EIST Technology       Supported         CPU C3 state       Supported         CPU C3 state       Supported         CPU C3 state       Supported         CPU C4 state       Supported         L1 Data Cache       32 kB × 2         L1 Code Cache       32 kB × 2         L2 Cache       256 kB × 2         L3 Cache       3072 kB         Execute Disable Bit       [Enabled]         Intel Virtualization Technology       [Enabled]         Energy Performance       [Performance]]         Energy Performance       [Performance]]         Energy Performance       [Performance]]         GPU CT5       [Enabled]	Processor Cores	2	
Intel VT-× Technology       Supported         Intel SMX Technology       Not Supported         64-bit       Supported         CPU C3 state       Supported         CPU C7 state       Supported         L1 Data Cache       32 kB × 2         L1 Code Cache       32 kB × 2         L2 Cache       32 kB × 2         L3 Cache       3072 kB         Execute Disable Bit       [Enabled]         Intel Virtualization Technology       [Enabled]         Boot performance mode       [Turbo Performance]         EIST       [Enabled]         Turbo Mode       [Disabled]         CPU DTS       [Enabled]         CPU DTS       [Enabled]	Intel HT Technology	Supported	
Intel SMX Technology       Not Supported         64-bit       Supported         EIST Technology       Supported         CPU C5 state       Supported         CPU C5 state       Supported         CPU C7 state       Supported         L1 Data Cache       32 KB × 2         L1 Data Cache       32 KB × 2         L1 Code Cache       32 KB × 2         L2 Cache       256 KB × 2         L3 Cache       307 KB         Execute Disable Bit       [Enabled]         Intel Virtualization Technology       [Enabled]         EIST       [Enabled]         Energy Performance       [Performance]         Energy Performance       [Performance]         ACPU CTP BIDS       [Disabled]         CPU DTS       Labled]	Intel VT–x Technology	Supported	
64-bit       Supported         EIST Technology       Supported         CPU C3 state       Supported         CPU C3 state       Supported         CPU C7 state       Supported         L1 Data Cache       32 kB × 2         L1 Code Cache       32 kB × 2         L2 Cache       256 kB × 2         L3 Cache       3072 kB         Execute Disable Bit       Enabled]         EIST       Enabled]         EIST       Enabled]         EIST       Enabled]         EIST       Enabled]         Energy Performance       [Performance]         EIST       Enabled]         Curbo Node       [Disabled]         Energy Performance       [Performance]         CPU DTS       [Enabled]	Intel SMX Technology	Not Supported	
EIST Technology       Supported         CPU C3 state       Supported         CPU C3 state       Supported         CPU C7 state       Supported         L1 Data Cache       32 kB × 2         L1 Code Cache       32 kB × 2         L2 Cache       256 kB × 2         L3 Cache       3072 kB         Execute Disable Bit       Enabled]         E1ST       [Enabled]         Boot performance mode       [Turbo Performance]         E1ST       [Enabled]         Energy Performance       [Performance]         ACPL CTP BIDS       [Disabled]         CPU DTS       [Enabled]	64-bit	Supported	
CPU C3 state       Supported         CPU C5 state       Supported         CPU C7 state       Supported         L1 Data Cache       32 kB x 2         L1 Code Cache       32 kB x 2         L2 Cache       32 kB x 2         L3 Cache       32 kB x 2         L3 Cache       3072 kB         Execute Disable Bit       [Enabled]         Execute Disable Bit       [Enabled]         Etst       [Energy Performance         CPu OTs       [Performance]         Einergy Performance       [Performance]         CPU DTS       [Enabled]         CPU DTS       [Enabled]	EIST Technology	Supported	
CPU C6 state       Supported         CPU C7 state       Supported         L1 Data Cache       32 kB × 2         L1 Data Cache       32 kB × 2         L1 Code Cache       32 kB × 2         L2 Cache       256 kB × 2         L3 Cache       32 kB × 2         L2 Cache       256 kB × 2         L3 Cache       30 kB × 2         L4 Cache       30 kB × 2         L5 Cache       30 kB × 2         L4 Save & 2 kB × 2       F1: General Help         L3 Cache       30 kB kB         Execute Disable Bit       [Enabled]         Intel Virtualization Technology       [Enabled]         EIST       [Enabled]         Turbo Mode       [Disabled]         Energy Performance       [Performance]         ACPI CTP BIDS       [Disabled]         CPU DTS       [Enabled]         CPU DTS       [Enabled]	CPU C3 state	Supported	
CPU C7 state       Supported       ++: Select Screen         L1 Data Cache       32 kB × 2       Enter: Select         L1 Code Cache       32 kB × 2       +/-: Change Opt.         L2 Cache       256 kB × 2       F1: General Help         L3 Cache       3072 kB       F2: Previous Values         F3: Optimized Defaults       F4: Save & Exit         Intel Virtualization Technology       [Enabled]       ESC: Exit         Boot performance mode       [Turbo Performance]       ESC: Exit         EIST       [Enabled]       ESC: Exit         ACPI CTP BIDS       [Disabled]       [Enabled]         CPU DTS       [Enabled]       [Enabled]	CPU C6 state	Supported	
L1 Data Cache       32 kB × 2       Enter: Select Item         L1 Data Cache       32 kB × 2       Enter: Select         L2 Cache       256 kB × 2       F1: General Help         L3 Cache       3072 kB       F2: Previous Values         Execute Disable Bit       [Enabled]       F4: Save & Exit         Intel Virtualization Technology       [Enabled]       ESC: Exit         Boot performance mode       [Turbo Performance]       ESC: Exit         EIST       [Enabled]       ESC: Exit         ACPI CTOP BIDS       [Disabled]       Enabled]         CPU DTS       [Enabled]       Enabled]	CPU C7 state	Supported	++: Select Screen
L1 Data Cache       32 kB × 2       Enter: Select         L1 Code Cache       32 kB × 2       +/-: Change Opt.         L2 Cache       256 kB × 2       F1: General Help         L3 Cache       3072 kB       F2: Previous Values         Execute Disable Bit       [Enabled]       F4: Save & Exit         Intel Virtualization Technology       [Enabled]       ESC: Exit         Boot performance mode       [Disabled]       ESC: Exit         Turbo Mode       [Disabled]       Esci Enabled]         Energy Performance       [Performance]       Enabled]         CPU DTS       [Enabled]       Enabled]			↑↓: Select Item
L1 Code Cache 32 kB × 2 +/-: Change Opt. L2 Cache 256 kB × 2 F1: General Help L3 Cache 3072 kB F2: Previous Values Execute Disable Bit [Enabled] F4: Save & Exit Intel Virtualization Technology [Enabled] Boot performance mode [Turbo Performance] EIST [Enabled] Turbo Mode [Disabled] Energy Performance [Performance] Energy Performance [Performance] CPU DTS [Enabled] CPU DTS [Enabled]	L1 Data Cache	32 kB x 2	Enter: Select
L2 Cache       256 kB × 2       F1: General Help         L3 Cache       3072 kB       F2: Previous Values         Execute Disable Bit       [Enabled]       F4: Save & Exit         Intel Virtualization Technology       [Enabled]       ESC: Exit         Boot performance mode       [Turbo Performance]       ESC: Exit         EIST       [Enabled]       ESC: Exit         Energy Performance       [Performance]       Energy Performance         QPU OTS       [Disabled]       Enabled]         CPU DTS       [Enabled]       Enabled]	L1 Code Cache	32 KB × 2	+/-: Change Opt.
L3 Cache 3072 kB F2: Previous Values Execute Disable Bit [Enabled] F4: Save & Exit Intel Virtualization Technology [Enabled] Boot performance mode [Turbo Performance] EIST [Enabled] Energy Performance [Performance] ACPI CTOP BIOS [Disabled] CPU DTS [Enabled] CPU DTS [Enabled] CPU DTS [Enabled]	L2 Cache	256 kB x 2	F1: General Help
Execute Disable Bit       [Enabled]       F3: Optimized Defaults         Intel Virtualization Technology       [Enabled]       F4: Save & Exit         Boot performance mode       [Turbo Performance]       ESC: Exit         EIST       [Enabled]       Esc: Exit         Turbo Mode       [Disabled]       Energy Performance         Energy Performance       [Performance]       Energination (Disabled)         CPU DTS       [Enabled]       Enabled]	L3 Cache	3072 KB	F2: Previous Values
Execute Disable Bit     [Enabled]     F4: Save & Exit       Intel Virtualization Technology     [Enabled]     ESC: Exit       Boot performance mode     [Turbo Performance]     ESC: Exit       EIST     [Enabled]     Esc: Exit       Turbo Mode     [Disabled]     Energy Performance       Energy Performance     [Performance]       CPU DTS     [Enabled]			F3: Optimized Defaults
Intel Virtualization Technology       [Enabled]       ESC: Exit         Boot performance mode       [Turbo Performance]       ESC: Exit         Turbo Mode       [Disabled]       Energy Performance         Energy Performance       [Performance]       Energy Performance         ACPI CTDP BIDS       [Disabled]       Enabled]         CPU DTS       [Enabled]       Enabled]			F4: Save & Exit
Boot performance mode     [Turbo Performance]       EIST     [Enabled]       Turbo Mode     [Disabled]       Energy Performance     [Performance]       ACPI CTOP BIOS     [Disabled]       CPU DTS     [Enabled]	Intel Virtualization Technology	[Enabled]	ESC: Exit
EIST [Enabled] Turbo Mode [Disabled] Energy Performance [Performance] ACPI CTOP BIOS [Disabled] CPU DTS [Enabled] Vacaine 2, 15, 1026 Computation (C), 2014 American Marchande Inc.	Boot performance mode	[Turbo Performance]	
Turbo Mode [Disabled] Energy Performance [Performance] ACPI CTDP BIOS [Disabled] CPU DTS [Enabled]	EIST	[Enabled]	
Energy Performance [Performance] ACPI CTDP BIOS [Disabled] CPU DTS [Enabled] Vacaine 2, 15, 1226 Complete (2), 2014 Appliant Marchande Tech	Turbo Mode	[Disabled]	
ACPI CTOP BIOS [Disabled] CPU DTS [Enabled]	Energy Performance	[Performance]	
CPU DTS [Enabled]	ACPI CTDP BIOS	[Disabled]	
Vapping 9, 45, 4996, Copyright (C), 2014 Apping Magategrade, Tech	CPU DTS	[Enabled]	
Vapier 9 45 4996 Peruniakt (P) 9014 Appier Magaterial Tech			
Vacian 0.45.4000, Convertidat (D) 0014 Aperian Marateorda, Tea			
			usuale. The

## 3.2.2.5 SATA Configuration

Advanced	Aptio Setup Utility – Copyright (C)	2014 American Megatrends, Inc.
SATA Controller(s) SATA Mode Selection SATA Controller Speed	[Enabled] [AHCI] [Default]	Enable or Disable SATA Port
Serial ATA Port O Software Preserve Port O	Empty Unknown [Enabled]	
Serial ATA Port 1 Software Preserve Port 1	Empty Unknown [Enabled]	
Serial ATA Port 2 Software Preserve Port 2	Empty Unknown [Enabled]	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.15.1236. Copyright (C) 20	014 American Megatrends, Inc.

BIOS Setting	Description	Setting Option	Effect
SATA Controller (s)	Allows users to enable	Enabled/	Set desirable
	or disable the SATA	Disabled	configuration
	controller (s)		
SATA Mode	Allows users to select	Enabled/	Set desirable
Selection	mode of SATA	Disabled	configuration
	controller (s)		
SATA Controller	Allows users to select	Enabled/	Set desirable
Speed	mode of SATA	Disabled	configuration
	Controller Speed		
Serial ATA Port	Allows users to enable	Enabled/	Set desirable
0/1/2	or disable the SATA	Disabled	configuration
	Port		

## 3.2.2.6 Intel<sup>®</sup> Rapid Start Technology

## Allows users to enable or disable Intel rapid start technology.

Aptic Advanced	Setup Utility – Copyright (C) 2014 American Mega	atrends, Inc.
Intel(R) Rapid Start Technology	[Enabled]	
No valid partition Entry on S3 RTC Wake Entry After Active Page Threshold Support Hybrid Hard Disk Support RapidStart Display Save/Restore	[Enabled] 10 [Disabled] [Disabled] [Disabled]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
		F4: Save & Exit ESC: Exit

## 3.2.2.7 PCH (FW) Configuration

Advanced	Aptio Setup Utility – Copyright (C) 20	14 American Megatrends, Inc.
ME FW Version ME Firmware Mode ME Firmware Type ME Firmware SKU	9.5.13.1706 Normal Mode Full Sku Firmware 5MB	++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

## 3.2.2.8 USB Configuration

Aptio Se Advanced	tup Utility – Copyright (C) 2014 American Mega	trends, Inc.
USB Configuration		
USB Module Version	8.10.32	
USB Devices: 1 Drive, 1 Keyboard, 1 Mouse,	1 Hub	
Legacy USB Support XHCI Hand-off EHCI Hand-off USB Mass Storage Driver Support USB handware delays and time-outs: USB transfer time-out Device reset time-out Device nomer-un delay	[Enabled] [Enabled] [Disabled] [Enabled] [20 sec] [20 sec] [Auto]	
Mass Storage Devices: JetFlashTranscend 166B 1.00	[Auto]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

BIOS Setting	Description	Setting Option	Effect
Legacy USB	User can enable or	Disabled	Will keep USB devices
Support	disable USB port.		available only for EFI
			applications.
		Enabled	Enable all the USB
			devices
XHCI Hand-off	This is a workaround	Disabled	Disables this function
	for OSs without XHCI		
	hand- off support.	Enabled	Enables this function
EHCI Hand-off	This is a workaround	Disabled	Disables this function
	for OSs without ECHI	Enabled	Enables this function
	hand- off support.		
USB Mass	User can Enable or	Disabled	Disables this function
Storage Driver	disable USB mass	Enabled	Enables this function
Support	storage driver		
	support.		
USB Transfer	The time-out value for	1 Sec	Depends on the time-out

time- out	control, bulk, and	5 Sec	value
	interrupt transfers.	10 Sec	
		20 Sec	
Device Reset	USB mass storage	10 Sec	Depends on the time-out
time- out	device start unit	20 Sec	value
	command time- out.	30 Sec	
		40 Sec	
Device	Maximum time the	Auto	Uses default value: for a
power-up	device will take before		root port it is 100 ms, for
delay	it properly reports		a Hub port the delay is
	itself to the host		taken from Hub
	controller.		descriptor
Mass Storage	Mass storage device	[AUTO]	Configure mass storage
Device	emulation type.	enumerates	device emulation type
		devices less	
		than 530MB as	
		floppies.	
		Forced FDD	
		option can be	
		used to force	
		HDD	
		formatted	
		drive to boot	
		as FDD	

#### 3.2.2.9 F81866 H/W Monitor

Advanced	Aptio Setup Utility – Copyright (C)	2014 American Megatrends, Inc.
Pc Health Status		
Smart Fan Function ▶ Smart Fan Mode Configu	[Enabled] uration	
<ul> <li>Smart Fan Mode Configu</li> <li>CPU Temperature</li> <li>QM67 Temperature</li> <li>CPU Fan Speed</li> <li>VCORE</li> <li>+12V</li> <li>+5V</li> <li>+3.3V</li> <li>VSB5V</li> <li>VSB3V</li> <li>VBAT</li> </ul>	unation : +35 C : +38 C : 3614 RPM : +1.752 V : +12.320 V : +5.171 V : +3.376 V : +5.184 V : +3.408 V : +3.280 V	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

BIOS Setting	Description	Setting Option	Effect
Smart Fan Function	Set parameters of smart fan function	Enabled/ Disabled	Enable or disable this function
Smart Fan Mode Configuration	Configure	smart fan mode set	tings

## 3.2.2.10 F81866 Super IO Configuration

Advanced	Aptio Setup Utility – Copyright (C) 2014 America	an Megatrends, Inc.
Advanced F81866 Super IO Configurati F81866 Super IO Chip Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration SuperIO WatchDog Timer Sett SuperIO GPIO Setting	Aptio Setup Utility - Copyright (C) 2014 America on F81866 ; ;	an Megatrends, Inc.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.15.1236. Copyright (C) 2014 American	Megatrends, Inc.

BIOS Setting	Description	Setting Option	Effect
Setting Serial Port	User can Enable/Disable	Enable/Disable	Enable or
Parameters	the serial port and select		Disable Serial
	optimal settings for the	Default:	Port (COM).
	Super IO Device.	Enable	
Super IO Watch	The watchdog timer cire	cuit has to be trig	gered within a
Dog Timer Setting	specified time by the application software. If the watchdog is		f the watchdog is
	not triggered because proper software execution fails or a		
	hardware malfunction occurs, it will reset the system.		

#### Pin 3~ Pin 10 Control Settings.

Advanced	Aptio Setup Utility – Copyright (C	C) 2014 American Megatrends, Inc.	
SuperIO GPIO Setting			
Pin 3 Control Pin 4 Control Pin 5 Control Pin 6 Control Pin 7 Control Pin 9 Control Pin 9 Control Pin 10 Control	(Input) (Input) (Input) (Input) (Input) (Input) (Input) (Input)	+*: Select Screen 1: Select Item Enter: Select 4/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
	Version 2.15.1236. Copyright (C)	2014 Hilerican Mexatrenus, INC.	

#### 3.2.2.11 Serial Port RS232/RS422/RS485 Settings

Advanced	Aptio Setup Utility – Copyright (C) 2015	American Megatrends, Inc.
Serial Port 1 Configurati	on	Select RS232/ RS422/ RS485(Rx)/ RS485(Tx)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	
Change Settings	[Auto]	
UART Mode	[RS232]	
		++: Select Screen
		Enter: Select
		+/-: Change Opt. E1: General Heln
		F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
	Version 2.17.1247. Copyright (C) 2015 A	merican Megatrends, Inc.

BIOS Setting	Description	Setting Option	Effect
Serial Port	Select Serial Port	RS232 / RS422	Choose Serial
		RS485 (Rx)/	Port Settings
		RS485(Tx)	
Change Settings	Allow Change Serial	[AUTO]	
	Port Settings		
UART Mode	Show which serial port is used		

#### 3.2.2.12 Chipset Menu



## 3.2.2.13 PCH- IO Configuration

Chipset	Aptio Setup Utility – Copyright (C)	2014 American Megatrends, Inc.
Intel PCH RC Version Intel PCH SKU Name Intel PCH Rev ID	1.6.2.0 Premium SKU 04/B2	
<ul> <li>PCI Express Configuration</li> <li>USB Configuration</li> </ul>		
PCH LAN Controller Wake on LAN Board Capability SLP_S4 Assertion Width Restore AC Power Loss	[Enabled] [Disabled] [SUS_PHR_DN_ACK] [4-5 Seconds] [Power Off]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.15.1236. Copyright (C) 20	)14 American Megatrends, Inc.

Description	Setting Option	Effect
Detail of PCI Express	N/A	Set desirable
items.	N/A	parameters
Dotails of USP itoms	NI/A	Set desirable
Details of USB items	N/A	parameters
Enables or disables the	Enabled/	Set desirable
LAN1/2 controller.	Disabled	parameters
Enables or disables	Enabled/	Sat docirable
LAN1/2 wake up from	Disabled	Set desirable
sleep state.	Disabled	parameters
Sets a minimum assertion width for the SLP_S4# signal	[4-5 seconds]	Set desirable parameters
This item allows users to select off, on and last state	Power on/ Power off	Set desirable parameters
	Description Detail of PCI Express items. Details of USB items Enables or disables the LAN1/2 controller. Enables or disables LAN1/2 wake up from sleep state. Sets a minimum assertion width for the SLP_S4# signal This item allows users to select off, on and last state.	DescriptionSetting OptionDetail of PCI Express items.N/ADetails of USB itemsN/ADetails of USB itemsN/AEnables or disables the LAN1/2 controller.Enabled/ DisabledEnables or disables LAN1/2 wake up from sleep state.Enabled/ DisabledSets a minimum assertion width for the SLP_S4# signal[4-5 seconds]This item allows users to select off, on and last state.Power on/ Power off

## 3.2.2.14 PCI Express Configuration

Aptio Chipset	Setup Utility – Copyright (C) 2014 Amer	ican Megatrends, Inc.
PCI Express Configuration		
DMI Link ASPM Control DMI Link Extended Synch Control PCIe-USB Glitch W/A	[Enabled] [Disabled] [Disabled]	
<ul> <li>PCI Express Root Port 4</li> <li>PCI Express Root Port 5</li> <li>PCI Express Root Port 6</li> </ul>		
		++: Select Screen 14: Select Item Enter: Select
		+/−: Change Opt. F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit ESC: Exit
Vans	ion 2 15 1236 . Converget (C) 2014 Americ	an Medatrends Inc

BIOS Setting	Description	Setting Option	Effect
DMI Link ASPM	Allows users to enable or	Enabled/	Set desirable
Control	disable the DMI Link ASPM	Disabled	parameters
	Control		
DMI Link	Allows users to configure	Enabled/	Set desirable
Extended Synch	Mini PCI Express setting	Disabled	parameters
Control			
PCIe- USB Glitch	For bad USB devices	Enabled/	Set desirable
W/A	connected behind	Disabled	parameters
	PCIE/PEG port		

## 3.2.2.15 USB Configuration

Aptio Chipset	Setup Utility – Copyright (C) 2014	American Megatrends, Inc.
USB Configuration		
USB Precondition XHCI Mode XHCI Idle L1 BTCG	[Disabled] [Smart Auto] [Enabled] [Enabled]	
USB Ports Per-Port Disable Control	[Disabled]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Versi	on 2.15.1236. Copyright (C) 2014 Ar	merican Megatrends, Inc.

BIOS Setting	Description	Setting Option	Effect
USB	Allows user to enable or	Enabled/	Set desirable
Precondition	disable USB precondition	Disabled	parameters
XHCI Mode	Allows user to enable or	[Smart Auto]	Set desirable
	disable XHCI mode.		parameters
USB Ports	Control each of the USB	Enabled/	Set desirable
Per-Port Disable	ports (0~13) disabling	Disabled	parameters
Control			

## 3.2.2.16 System Agent (SA) Configuration

Allows users to enable or disable VT-d.

Chipset	Aptio Setup Utility – Copyright (C)	2014 American Megatrends, Inc.	
System Agent Bridge Name System Agent RC Version VT-d Capability	Haswell 1.6.2.0 Unsupported		
▶ Graphics Configuration		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
	Version 2 15 1236 Conuriabt (C) 20	114 American Megatrends. Tor	

## 3.2.2.17 Graphics Configuration

Chipset	Aptio Setup Utility – Copyright (C)	2014 American Megatrends, Inc.
Graphics Configuration IGFX VBIOS Version IGfx Frequency Graphics Turbo IMON Current	2180 800 MHz 31	
Primary PEG Internal Graphics Aperture Size DVMT Fre-Allocated DVMT Total Gfx Mem Gfx Low Power Mode Panel Power Enable	[Auto] [Auto] [256MB] [32M] [256M] [Enabled] [Disabled]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Vencion 9 1E 1996 Conunight (C) 96	44 Open Jacob Martinenda Tra

BIOS Setting	Description
Graphics Turbo IMON	Allows users to select which Graphics Turbo IMON
Current	Current
Internal Graphics	Allows users to enable or disable IGD
Aperture Size	This item allows users to select aperture size
DVMT Pre-Allocated	Allows users to select DVMT pre-allocated memory
	size
DVMT Total Gfx Mem	Allows users to select DVMT total memory size
Gfx Low Power Mode	Allows users to enable or disable IGD low power
	mode
Panel Power Enable	Allows users to enable or disable Panel Power

## 3.2.3 Boot Menu

The Boot menu sets the sequence of the devices to be searched for the operating system. The bootable devices will be automatically detected during POST and shown here, allowing you to set the sequence that the BIOS use to look for a boot device from which to load the operating system.

Main Advanced Chipset	Aptio Setup Utility – Copyright ( Boot Security Save & Exit	C) 2014 American Mega	itrends, Inc.	
Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot Fast Boot Boot Order Priorities Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #3 Boot Option #5 Boot Option #6 Boot Option #7 CSM16 Parameters CSM parameters	1 [Disabled] [Disabled] [Network] [SATA PO] [SATA PO] [SATA PI] [MSATA] [USB Key] [USB Key] [USB Key] [USB Co/OVD] [RAID Partition]	2014. Omen Loon, Megat	++: Select Scr 11: Select Ite Enter: Select +/-: Change Op F1: General He F2: Previous V F3: Optimized F4: Save & Exi ESC: Exit	reen m t. Plp Values Defaults t
	Version 2.15.1236. Copyright (C)	2014 American Megatr	ends, Inc.	
BIOS Setting	Description	2	Setting Ontion	Effect

BIOS Setting	Description	Setting	Effect
		Option	
Setup Prompt	Allows user to configure the	Enter	Set the prompt
Timeout	number of seconds to stay in BIOS		timeout
	setup prompt screen.		
Boot NumLock	Enables or disables NumLock	On	Remains On
State	feature on the numeric keypad of		
	the keyboard after the POST	Off	Remains OFF
	(Default: On).		
Quite Boot	Determines if POST message or	Disabled	Disables this
	OEM logo (default = Black		function
	background) is displayed.	Enabled	Enables this
			function

Fast Boot	Enables or disables Fast Boot to	Disabled	Disables this
	shorten the OS boot process.		function
	(Default: Disabled).	Enabled	Enables this
			function
Boot Option	Specifies the overall boot order	Ex: Boot	Hard drive as
Priorities	from the available devices	Option#1	the first priority
		(hard	
		drive)	

#### **3.2.4 Security Menu**

This section allows to configure and improve system, and set up some system features according to your preferences.



BIOS Setting	Description	Setting	Effect
		Option	
Administrator	Displays whether or not an	Enter	Enter password
Password	administrator password has been set.		
User Password	Display whether or not a user	Enter	Enter password
	Password has been set.		

## 3.2.5 Save & Exit

Aptio Setup Utility – Copyright (C) 2014 American Megat Main Advanced Chipset Boot Security <mark>Save &amp; Exit</mark>	rends, Inc.
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset	
Save Options Save Changes Discard Changes	
Restore Defaults Save as User Defaults Restore User Defaults	
Boot Override	
Launch EFI Shell from filesystem device	<pre>#: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

<b>BIOS Setting</b>	Description	Setting	Effect
		Option	
Save Changes	This saves the changes to the	Enter <yes></yes>	Save changes
and Exit	CMOS and exits the BIOS Setup		
	program.		
Discard	This exits the BIOS Setup	Enter <yes></yes>	Saves the
Changes and	without saving the changes		changes
Exi	made in BIOS Setup to the	Enter <no></no>	Return to the
	CMOS.		BIOS Setup
			Main Menu

Save Changes	Reset the system after saving	Enter <yes></yes>	Saves the	
and Reset	the changes.		changes	
		Enter <no></no>	Return to the	
			BIOS Setup	
			Main Menu	
Discard	Reset system setup without	Enter <yes></yes>	Saves the	
Changes and	saving any changes		changes	
Reset		Enter <no></no>	Return to the	
			BIOS Setup	
			Main Menu	
Save Changes	Save changes done so far to any	Enter <yes></yes>	Saves the	
	of the setup options.		changes	
		Enter <no></no>	Return to the	
			BIOS Setup	
			Main Menu	
Discard	Discard changes done so far to	Enter <yes></yes>	Saves the	
Changes	any of the setup options.		changes	
		Enter <no></no>	Return to the	
			BIOS Setup	
			Main Menu	
Restore	Restore/load default values for	Enter <yes></yes>	Saves the	
Default	all the setup options.		changes	
		Enter <no></no>	Return to the	
			BIOS Setup	
			Main Menu	
Save as User	Save the changes done so far as	Enter <yes></yes>	Saves the	
Defaults	User defaults.		changes	
		Enter <no></no>	Return to the	
			BIOS Setup	
			Main Menu	
Restore User	Restore the User Defaults to all	Enter <yes></yes>	Saves the	
Defaults	the setup options.		changes	
		Enter <no></no>	Return to the	
			BIOS Setup	
			Main Menu	
Boot Override	Boot device selection can	Enter <yes></yes>	Saves the	
	override your boot priority		changes	

	Enter <no></no>	Return to the
		BIOS Setup
		Main Menu

#### 3.3 Using Recovery Wizard to Restore Computer

IH32 motherboard has a dedicate recovery partition stored on the hard drive of the PC to enable quick one-key recovery process. This partition occupies about 11GB of the storage space, and comes built-in to each IH32 series PC.



Before starting the recovery process, be sure to backup all user data, as all data will be lost after the recovery process.

Warning!

Follow the procedure below to enable quick one-key recovery procedure:

- Plug-in the AC adapter to IH32 computer. Make sure the computer stays plugged in to power source during the recovery process
- Turn on the computer, and when the boot screen shows up, press the **F6** to initiate the Recovery Wizard
- The following screen shows the Recovery Wizard. Click on "Recovery" button to continue.



A warning message about data loss will show up. Make sure the data is backed up before recovery, and click "Yes" to continue.



Wait the recovery process to complete. During the recovery process, a command prompt will show up to indicate the percent of recovery process complete. The computer will restart automatically after recovery completed.

Cir Dinkara and	X:\windo	ws\System32\cmd.exe	Test 1		
DiskPart succ	seastully commanded	the disk.		Clove	
DiskPart succ	reded in creating	t the selected disk to G	PT format.		
100 percent	completed	the spectried partition			
DiskPart succ	essfully formatted	the volume.		22 10	
DiskPart succ	essfully assigned	the drive letter or now	t point.	2.2	
DiskPart succ	eeded in creating	the specified partition			
reb DiskPart succ	eeded in creating	the specified partition			
188 percent	completed				
DiskPart succ	essfully formatted	the volume.			
DiskPart succ	essfully assigned	the drive letter or now	t point.		
DiskPart succ	eeded in creating	the specified partition			
H percent	completed			·	
		Version 2014.02	10000		

# **Driver Installation**

This chapter offers information on the chipset software installations utilities. Sections include:

- 4.1 Chipset Driver Installation
- 4.2 Graphic Driver Installation
- 4.3 Audio Driver Installation
- 4.4 Ethernet Driver Installation
- 4.5 Fintek COM Port Driver Installation
- 4.6 Intel<sup>®</sup> Management Engine Software Installation
- 4.7 USB 3.0 Driver Installation (for Windows 7)



# **Chapter 4 Driver Installation**

## 4.1 Chipset Driver Installation

The Intel Chipset Drivers should be installed first before the software drivers enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

**Step 1** Insert the CD that comes with the motherboard. Open the file document "Chipset Driver" and click "Setup.exe" to install driver.

🖌 🙀 Favorites	Name	Date modified	Туре	Size
📃 Desktop	📕 All	10/6/2014 3:14 PM	File folder	
퉳 Downloads	길 ia64	10/6/2014 3:13 PM	File folder	
📃 Recent places	퉬 Lang	10/6/2014 3:13 PM	File folder	
	退 WIN7	10/6/2014 3:13 PM	File folder	
4 詞 Libraries	ル x64	10/6/2014 3:13 PM	File folder	
Documents	SVer.dll	8/5/2013 11:50 AM	Application extens	52 KB
🖻 🎝 Music	🚳 difxapi.dll	5/10/2012 12:34 PM	Application extens	316 KB
🖻 🔚 Pictures	🖉 Help	9/15/2006 10:10 AM	Text Document	1 KB
🛛 🛃 Videos	🖉 IIF2	2/12/2008 2:26 PM	Configuration sett	1 KB
	IIF2v	6/11/2013 3:45 PM	Configuration sett	472 KB
🛯 📜 Computer	🗍 mup	8/5/2013 11:50 AM	XML File	158 KB
ᡖ Local Disk (C:)	🧾 readme	8/5/2013 11:49 AM	Text Document	94 KB
) 👝 PK (D:)	🔜 Setup	12/23/2013 5:09 PM	Application	936 KB
Step 2 Click "Next" to start the installation.



Step 3 Click "Next" to continue the installation.



Step 4 Click "Yes, I want to restart this computer now" to finish installation.



## 4.2 Graphic Driver Installation

IH32 Motherboard comes with Intel mobile Core i5 Dual Core CPU and integrated graphic controller. You need to install the Graphic driver to enable the function. Intel Graphic supports versatile display options and 32-bit 3D graphics engine. Triple independent display, enhanced display modes for widescreen flat panels for extend, twin, and clone display mode.

**Step 1** Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Navigate to the "Graphic Driver" folder and click "setup.exe" to complete the installation.



Step 2 Click "Next" to install the driver.



Step 3 Click "Yes" to agree with the license terms.

ntel® Graphics Drive		(	(intel)
You must accept all of the terms o program. Do you accept the terms	f the license agreement in order ti ?	o continue the	e setup
INTEL SOFTWARE LICENSE AGRE IMPORTANT - READ BEFORE COP Do not use or load this software a until you have carefully read the f Software, you agree to the terms install or use the Software.	EMENT (OEM / IHV / ISV Distribution YING, INSTALLING OR USING. Ind any associated materials (collection) following terms and conditions. By of this Agreement. If you do not	on & Single Us ectively, the "s loading or usi wish to so ag	ser) A Software") ing the ree, do not
Please Also Note:	t Manufacturer (OEM), Independe	ent Hardware	Vendor
* If you are an Original Equipment (IHV), or Independent Software V * If you are an End-User, then on	endor (ISV), this complete LICEN ly Exhibit A, the INTEL SOFTWAR	E LICENSE AG	REEMENT,

### Step 4 Click "Next" to install the driver.

inter® insta	allation Framework	_ 1	<b>-</b> >
ntel® Graphics Driver Readme File Information		(int	el
Refer to the Readme file below to view the Readme File	system requirements and inst	tallation informat	ion.
Release Version: Production Version			
Release Version: Production Version Driver Version: 15.33.11.64.3379 Operating System(s):			
Release Version: Production Version Driver Version: 15.33.11.64.3379 Operating System(s): Microsoft Windows <sup>*</sup> 8 64 Microsoft Windows <sup>*</sup> 8.164			~

#### Step 5 Click "Yes, I want to restart this computer now" to finish installation.



## 4.3 Audio Driver Installation

The ALC886 series are high-performance 7.1+2 Channel High Definition Audio Codecs providing ten DAC channels that simultaneously support 7.1 sound playbacks, plus 2 channels of independent stereo sound output (multiple streaming) through the front panel stereo outputs. The series integrates two stereo ADCs that can support a stereo microphone, and feature Acoustic Echo Cancellation (AEC), Beam Forming (BF), and Noise Suppression (NS) technology.

The user must confirm which operating system is running on the IH32 Motherboard before installing the Audio drivers. Follow the steps below to complete the installation of the Realtek ALC886 Audio drivers. You will quickly complete the installation.

**Step 1** Insert the CD that comes with the motherboard. Open the folder "Audio Driver" and click on "Audio" (64bit\_Vista\_Win7\_Win8\_R271) to execute the setup.

Audio(64bit\_Vista\_Win7\_Win8\_R271 9/10/2013 5:45 PM Application 79,973 KB

**Step 2** Click "Next" to start the installation.



Step 3 Click "Yes, I want to restart my computer now" to finish the installation.



### **4.3 Ethernet Driver Installation**

The users must confirm which operating system is used on the IH32 Motherboard before installing the Ethernet drivers. Follow the steps below to complete the installation of the Intel<sup>®</sup> I210IT Gigabit-LAN Controller + I218LM Gigabit-LAN drivers. You will quickly complete the installation.

Step 1 Insert the driver CD and select the "LAN Driver" folder.



Step 2 Extract the "PROWinX64\_19.0" file and click "Next" to install the driver.

B	Intel(R) Network Connections Install Wizard	×
Welcom Networ	ne to the install wizard for Intel(R) k Connections	(intel)
	Installs drivers, Intel(R) Network Connections, and Advanced Networking Services.	
	WARNING: This program is protected by copyright law and international treaties.	
	< Back Next >	Cancel

Step3 Click "Next" to agree with the license terms.

ø	Intel(R) Netw	ork Connections	Install Wizard	×
License / Please r	Agreement read the following license a	greement carefully.		(intel)
	INTEL SOFT	WARE LICENSE AGR	eement	^
	IMPORTANT - READ BE	EFORE COPYING, IN S	TALLING OR USIN	IG.
Do not co (collectiv ("Agreen By copyin the terms	opy, install, or use this s ely, the "Software") pr nent") until you have ca ng, installing, or otherw s of this Agreement. If y	software and any as ovided under this lic arefully read the follo rise using the Softwa you do not agree to t	sociated materia ense agreement wing terms and are, you agree to he terms of this a	lls conditions. be bound by Agreement, v
I accept	the terms in the license ag	greement		Print
O I do not	accept the terms in the lic	ense agreement		

### Step 4 Click "Next" to install the driver.

Intel(R)	Network Conne	ections	×
Setup Options Select the program features you wan	t installed.		(intel)
Install:			
Intel(R) PROSet for Windows* De Advanced Network Services Windows* PowerShell Module Intel(R) Network Connections SN	evice Manager MP Agent		
Feature Description Enables sending event notices using Sin Requires that the Microsoft SNMP Servi	nple Network Manag ce be installed.	ement Protocol (SNI	MP).
	-		_

**Step 5** Click "Finish" to complete the driver installation.

ø	Intel(R) Network Connections Install Wizard	×
Install	wizard Completed	(intel)
	To access new features, open Device Manager, and view the properties of the network adapters.	
	< Badk Finish	Cancel

### 4.5 Fintek COM Port Driver Installation

Step 1 If your system is WIN7, please first close UAC (refer to the following

"Disabling User Account")

Control (UAC) in Windows 7"

**Step 2** Extract the Patch\_0408.zip to a folder.

**Step 3** Double-click batch file (patch.bat) to install the driver.

Step 4 Check the driver installation success.

There is a screenshot before the update below.

ganize	e 💌 🔳 Open with	New folder		800 • []	
1.	Name	Date modified	Туре	Size	
20	sbp2port.sys	2010/11/21 上午 05:29	System file	84 KB	
-	scfilter.sys	2010/11/21 上午 05:29	System file	26 KB	
	🚳 scsiport.sys	2010/11/21 上午 05:29	System file	137 KB	
10	🚳 secdrv.sys	2009/7/14 上午 04:50	System file	20 K.B	
	serenum.sys	2009/7/14 上午 07:45	System file	18 KB	
-	🚳 serial.sys	2009/7/14 上午 07:45	System file	82 KB	
	🚳 sermouse.sys	2009/7/14 上午 07:45	System file	20 KB	
	🚳 sffdisk.sys	2009/7/14 上午 07:45	System file	11 KB	
	🚳 sffp_mmc.sys	2009/7/14 上午 07:45	System file	12 KB	
	🚳 sffp_sd.sys	2010/11/21 上午 05:29	System file	13 KB	

	🛛 😺 🕊 Windows 🕨 Syste	em32 🕨 drivers 🕨	<ul> <li>◄ 4→ Search driver</li> </ul>	1	۶
Organize	• 🔹 💽 Open with	New folder		8= • 🗔	0
1.	Name	Date modified	Туре	Size	
2	sbp2port.sys	2010/11/21 上午 05:29	System file	84 KB	
	🚳 scfilter.sys	2010/11/21 上午 05:29	System file	26 KB	
3	🚳 scsiport.sys	2010/11/21 上午 05:29	System file	137 KB	
10	secdrv.sys	2009/7/14 上午 04:50	System file	20 K.B	
	🚳 serenum.sys	2009/7/14 上午 07:45	System file	18 KB	
1	serial.sys	2011/6/22 上午11:39	System file	90 KB	
	🕸 эснночэсауа	2009/7/14 上午 07,45	System file	20 KD	
	sffdisk.sys	2009/7/14 上午 07:45	System file	11 KB	
	S sffp mmc.svs	2009/7/14 上午 07:45	System file	12 KB	

There is a screenshot after the update and update success below.

Step 5 Restart the computer to complete driver installation.Type in this command from the Run menu:C:\Windows\System32\UserAccountControlSettings.exe or UAC

Control Panel (1)	
P Change User Account	Control settings
See more results	
1120	× Shut down

To turn off UAC move the slider to the Never notify position, and then click OK. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

Choose when to User Account Control Tell me more about U:	be notified about changes to your computer helps prevent potentially harmful programs from making changes to your computer. her Account Control settings
Always notify	
	Default - Notify me only when programs try to make changes to my computer
	<ul> <li>Don't notify me when I make changes to Windows settings</li> </ul>
+	Recommended if you use familiar programs and visit familiar websites.
Never notify	
	Cancel

To turn UAC back on, move the slider to choose when you want to be notified, and then click OK. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

You will need to restart your computer for UAC to be turned off.

•

# 4.6 Intel<sup>®</sup> Management Engine Software Installation

This installation program installs the Intel<sup>®</sup> ME software components required for the platform on which you are installing, and installs only those components that match your platform's capabilities.

Name	▼ Date modified	Туре	Size
📕 DAL	10/6/2014 3:17 PM	File folder	
🌡 Drivers	10/6/2014 3:17 PM	File folder	
📙 Firmware Recovery Agent	10/6/2014 3:16 PM	File folder	
📙 IFR	10/6/2014 3:16 PM	File folder	
📙 Intel Control Center	10/6/2014 3:16 PM	File folder	
IntelMEFWVER	10/6/2014 3:16 PM	File folder	
📙 IUS	10/6/2014 3:16 PM	File folder	
길 Lang	10/6/2014 3:16 PM	File folder	
\mu lms	10/6/2014 3:16 PM	File folder	
NAC_PP	10/6/2014 3:16 PM	File folder	
ル x64	10/6/2014 3:16 PM	File folder	
autorun 👔	8/8/2013 1:25 PM	Setup Information	1 KB
S DIFxAPI.dll	8/8/2013 1:25 PM	Application extens	312 KB
📋 mup	8/8/2013 1:25 PM	XML File	9 KB
🔙 Setup	8/8/2013 1:25 PM	Application	966 KB
Setup.if2	8/8/2013 1:25 PM	IF2 File	24 KB
🗿 version	8/8/2013 1:25 PM	Configuration sett	1 KB

Ster	<b>1</b> Insert the drive	er CD and select the	"Intel MF 9.0"	folder and	click "Setup.exe"
JUCH				ioluci anu	CHER JELUPICAE

Step 2 Click "Next" to continue the installation.



Step 3 Click "Yes" to agree with the License terms.



# **Step 4** Choose "I accept the terms of the license agreement", and click "Next" to continue.



Step 5 Click "Finish" to complete the software installation.



# 4.7 USB 3.0 Driver Installation (for Windows 7)



If the operating system of the device is Windows Embedded 8.1 Industry or Windows Embedded 8 Standard, users can skip this installation.

**Step 1** Locate the hard drive directory where the driver files are stored with the browser or the explore feature of Windows\*.

Step 2 Double-click the "Setup.exe" from this directory.

rganize 👻 🛅 Ope	en Newfolder			8== •	
Favorites	Name	Date modified	Туре	Size	
Desktop	🔒 apps	11/4/2015 4:50 PM	File folder		
Downloads	Drivers	11/4/2015 4:50 PM	File folder		
W Recent Places	🎳 Lang	11/4/2015 4:50 PM	File folder		
	🎉 x64	11/4/2015 4:50 PM	File folder		
🚽 Libraries	S DIFxAPI.dll	11/2/2006 7:21 AM	Application extens	312 KB	
Documents	mup	3/6/2014 10:08 AM	XML Document	9 KB	
J Music	Readme	3/6/2014 10:08 AM	Text Document	53 KB	
Fictures	M Setup	3/6/2014 10:08 AM	Application	944 KB	
Videos	Setup.if2	3/6/2014 10:08 AM	IF2 File	6 KB	
	SB3Ver.dll	3/6/2014 10:08 AM	Application extens	41 KB	
Computer					
Network					





Step 4 Read the License Agreement and click "Yes" to proceed.

Intel® Installation Framework	
Intel® USB 3.0 eXtensible Host Controller	Driver
License Agreement	(intel)
You must accept all of the terms of the license agreement in order to o program. Do you accept the terms?	continue the setup
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collect until you have carefully read the following terms and conditions. By lo Software, you agree to the terms of this Agreement. If you do not wi install or use the Software. Please Also Note: * If you are an Original Equipment Manufacturer (OEM), Independent (IHV), or Independent Software Vendor (ISV), this complete LICENSE * If you are an End-User, then only Exhibit A, the INTEL SOFTWARE I	& Single User)
< Back	Yes No
	Intel® Installation Framework

**Step 5** Review Readme File Information and click "Next" to proceed.



**Step 6** When the Setup Progress is complete click "Next" to proceed.

Intel® Installation Framework	
Intel® USB 3.0 eXtensible Host Controller Driv Setup Progress	er (intel)
Please wait while the following setup operations are performed:	
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 eXtensible Host Copying Registry Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersite Creating Registry Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersite	t Controller Driver \A t Controller Driver \A
Click Next to continue.	
Intel	Next >
Intel® Installation Framework	
Intel® USB 3.0 eXtensible Host Controller Dri	ver
Setup Progress	(intel)
Please wait while the following setup operations are performed:	
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 eXtensible Ho Copying File: C:\Windows\SysWOW64\difxapi.dll Copying File: C:\Windows\system32\difxapi.dll Creating Process: C:\Windows\system32\wevtutil.exe	ost Controller Driver\u st Controller Driver\u st Controller Driver\u st Controller Driver\u

– Intel® Installation Framework

**Step 7** Click "Yes, I want to restart this computer now" to finish and then restart your computer.





# **Technical Support Documents**

This chapter includes SDK list for this user manual.

5.1 Digital I/O SDK

5.2 Watchdog SDK

# **Chapter 5 Technical Support Documents**

### **SDK List**

You can download SDK from our download center, please click the link below. https://www.dropbox.com/s/l3lklrmigy2lip6/SDK.rar?dl=0

### 5.1 Digital I/O SDK

To find the Digital I/O Sample code, please refer to the IH32 driver CD SDK or contact us.

### 5.2 Watchdog SDK

To find the Watchdog Sample code, please refer to the IH32 driver CD SDK or contact us.