



IMB-156

User Manual

Version 1.0

Published March 2017

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# Chapter 1: Introduction

Thank you for purchasing ASRock **IMB-156** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website <http://www.asrock.com>

If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.

[www.asrock.com/support/index.asp](http://www.asrock.com/support/index.asp)

## 1.1 Package Contents

ASRock **IMB-156** Motherboard

(Mini-ITX Form Factor: 6.7-in x 6.7-in, 17.0 cm x 17.0 cm)

ASRock **IMB-156** Driver CD

ASRock **IMB-156** Jumper Setting Instruction

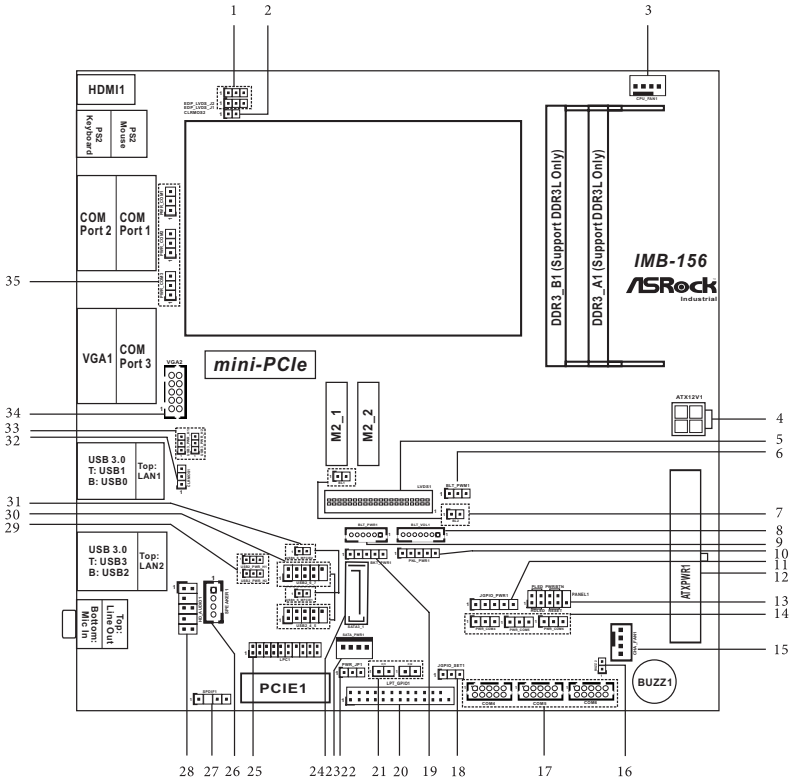
1 x I/O Panel Shield

## 1.2 Specifications

<b>Form Factor</b>	Dimensions	Mini-ITX (6.7-in x 6.7-in)
<b>Processor System</b>	CPU	BGA1296 for Intel® Apollo Lake SoC
	Core Number	(By CPU, Max 4)
	Max Speed	(By CPU)
	L2 Cache	(By CPU)
	Chipset	N/A
	BIOS	UEFI
<b>Expansion Slot</b>	Mini-PCIe	1 (half/full size, supports PCIe x1 and USB (shared))
	M.2	2 (1 x M2_1 Slot (Key M) supporting type 2242/2260 M.2 SATA3 6.0 Gb/s module. 1 x M2_2 Slot (Key E) supporting type 2230 WiFi/BT module)
	PCIe	1 x PCIe x1 slot
<b>Memory</b>	Technology	Dual Channel DDR3L 1867MHz
	Max.	16GB
	Socket	2 x SO-DIMM
<b>Graphics</b>	Controller	Intel® Gen9 Graphics 4K Codec Decode& Encode
	VRAM	Shared Memory
	VGA	Supports Max resolution up to 1920 x 1200
	LVDS	Supports Max resolution up to 1920 x 1200@60Hz
	HDMI	Supports HDMI, Max resolution up to 4096 x 2160@24Hz
	DVI	No
	DisplayPort	No
	Multi Display	Yes (Triple Display)
<b>Ethernet</b>	Ethernet	10/100/1000 Mbps
	Controller	2 x Realtek RTL8111G
	Connector	2 x RJ-45
<b>SATA</b>	Max Data Transfer Rate	SATA3 (6.0Gb/s)

<b>Rear I/O</b>	VGA	1
	DVI	0
	HDMI	1
	DisplayPort	0
	Ethernet	2
	USB	4 x USB 3.0
	Audio	2 (Mic-in, Line-out)
	Serial	3 x COM (Supports RS-232/422/485)
	PS/2	2
<b>Internal Connector</b>	USB	4 x USB 2.0 (2 x 2.54 pitch header)
	LVDS/ Inverter	1/1
	eDP	1
	VGA	1
	Serial	3 x COM (Supports RS-232 only)
	SATA	1
	mPCIe	1
	Parallel	1 (shared with GPIO)
	mSATA	0
	IrDA	0
	GPIO 8-bit	8 x GPI + 8 x GPO (shared with LPT header)
	SATA PWR Output Con	1
	Speaker Header	1
<b>Watchdog Timer</b>	Output	Output from super I/O to drag RESETCON#
	Interval	256 Segments, 0,1,2...255 Sec/Min
<b>Power Requirements</b>	Input PWR	+12V or +19V~+24V DC-In (4-pin ATX PWR Con / ATX)
	Power On	AT/ATX Supported -AT : Directly PWR on as power input ready -ATX : Press button to PWR on after power input ready
<b>Environment</b>	Temperature	0°C – 60°C

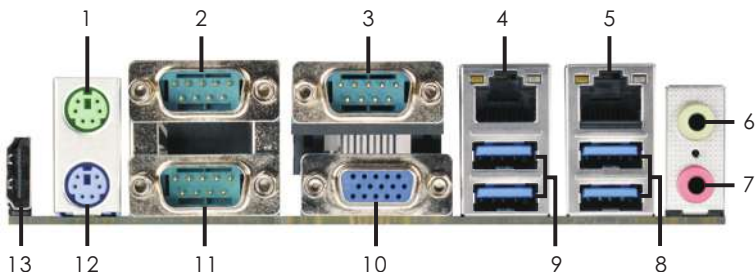
# 1.3 Motherboard Layout





- 
- 1 : EDP\_LVDS Jumpers (EDP\_LVDS\_J1, EDP\_LVDS\_J2)
  - 2 : Clear CMOS Jumper
  - 3 : 4-Pin CPU FAN Connector (+12V)
  - 4 : ATX Power Connector (Input 12V-24V)
  - 5 : LVDS Panel Connector
  - 6 : BLT\_PWM1
  - 7 : BL1, BL2
  - 8 : Backlight Volume Control (BLT\_VOL1)
  - 9 : Backlight Power Connector (BLT\_PWR1)
  - 10 : Panel Power Select (LCD\_VCC) (PNL\_PWR1)
  - 11 : Digital Input / Output Power Select (JGPIO\_PWR1)
  - 12 : 20-pin ATX Power Input Connector
  - 13 : System Panel Header
  - 14 : COM Port PWR Setting Jumpers (PWR\_COM4, PWR\_COM5, PWR\_COM6)
  - 15 : 4-Pin Chassis FAN Connector (+12V)
  - 16 : 2-Pin Buzzer Header
  - 17 : COM4, 5, 6 Headers (RS232)
  - 18 : Digital Input / Output Default Value Setting (JGPIO\_SET1)
  - 19 : Backlight Power Select (LCD\_BLT\_VCC) (BKT\_PWR1)
  - 20 : Printer Port / GPIO Header (LPT\_GPIO1)
  - 21 : Chassis Intrusion Headers (CI1, CI2)
  - 22 : ATX/AT Mode Select (PWR\_JP1)
  - 23 : SATA Power Output Connector
  - 24 : SATA3 Connector (SATA3\_1)
  - 25 : LPC Header
  - 26 : 3W Audio AMP Output Wafer
  - 27 : SPDIF Header
  - 28 : Front Panel Audio Header
  - 29 : USB Power Setting Jumpers (USB2\_PWR\_H1, USB2\_PWR\_H2)
  - 30 : USB2.0 Connectors (USB2\_4\_5, USB2\_6\_7)
  - 31 : USB6\_S\_MPCIE1, USB6\_S\_MPCIE2
  - 32 : Clear CMOS Header
  - 33 : USB Power Setting Jumpers (USB3\_PWR\_H1, USB3\_PWR\_H2)
  - 34 : VGA Header
  - 35 : COM Port PWR Setting Jumpers (PWR\_COM1, PWR\_COM2, PWR\_COM3)

## 1.4 I/O Panel



- |                      |                            |
|----------------------|----------------------------|
| 1 PS/2 Mouse Port    | 8 USB 3.0 Ports (USB3_2_3) |
| 2 COM Port 1 (COM1)* | 9 USB 3.0 Ports (USB3_0_1) |
| 3 COM Port 3 (COM3)* | 10 VGA Port (VGA1)         |
| 4 LAN RJ-45 Port**   | 11 COM Port 2 (COM2)*      |
| 5 LAN RJ-45 Port**   | 12 PS/2 Keyboard Port      |
| 6 Line out (Green)   | 13 HDMI Port (HDMI1)       |
| 7 Microphone (Pink)  |                            |

\* This motherboard supports RS232/422/485 on COM1~3 ports. Please refer to below table for the pin definition. In addition, COM1~3 ports (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to page 28 for details.

### COM1~3 Port Pin Definition

PIN	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	RX+	N/A
3	TXD	TX+	RTX+
4	DTR	RX-	N/A
5	GND	GND	GND
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	N/A	N/A
9	COM1: +5V/+12V/+5VSB COM2, 3: +5V/+12V	COM1: +5V/+12V/+5VSB COM2, 3: +5V/+12V	COM1: +5V/+12V/+5VSB COM2, 3: +5V/+12V

\*\* There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

### LAN Port LED Indications

#### Activity/Link LED

Status	Description
Off	No Link
Blinking	Data Activity
On	Link

#### SPEED LED

Status	Description
Off	10Mbps connection
Orange	100Mbps connection
Green	1Gbps connection

ACT/LINK LED    SPEED LED



LAN Port

---

## Chapter 2: Installation

This is a Mini-ITX form factor (6.7" x 6.7", 17.0 x 17.0 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

### 2.1 Screw Holes

Place screws into the holes to secure the motherboard to the chassis.



Do not over-tighten the screws! Doing so may damage the motherboard.

### 2.2 Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.



Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

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## 2.3 Installation of Memory Modules (SO-DIMM)

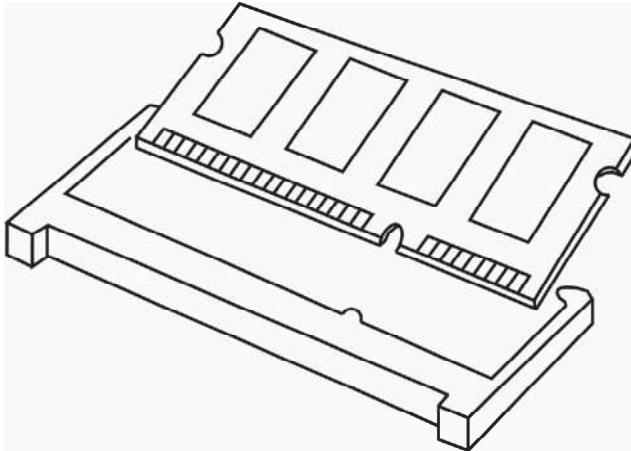
**IMB-156** motherboard provides two 204-pin DDR3 (Double Data Rate 3) SO-DIMM slots, which support Dual Channel DDR3L (low voltage).



1. If you install one memory module only, please install it on DDR3\_A1.
2. It is not allowed to install a DDR or DDR2 memory module into a DDR3 slot; otherwise, this motherboard and SO-DIMM may be damaged.
2. Please make sure to disconnect the power supply before adding or removing SO-DIMMs or the system components.
3. The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the SO-DIMM if you force the SO-DIMM into the slot at incorrect orientation.

### Installing a SO-DIMM

Step 1. Align a SO-DIMM on the slot such that the notch on the SO-DIMM matches the break on the slot.



Step 2. Firmly insert the SO-DIMM into the slot until the retaining clips at both ends fully snap back in place and the SO-DIMM is properly seated.

---

## 2.4 Expansion Slots (mini-PCIe, PCI Express and M.2 Slots)

There is 1 mini-PCIe slot, 1 PCI Express slot and 2 M.2 slots on this motherboard.

### mini-PCIe slot:

MINI\_PCIE1 (mini-PCIe slot; half/full size) is used for PCI Express mini cards.

**PCIe slot:** PCIe1 (PCIe x1 slot) is used for PCI Express x1 lane width cards.

**M.2 slots:** M2\_1 Slot (Key M) supports type 2242/2260 M.2 SATA3 6.0 Gb/s module.

M2\_2 Slot (Key E) supports type 2230 WiFi/BT module.



USB2\_6\_7 is shared with MINI\_PCIE1. If you use USB2\_6\_7 connector, the USB device on MINI\_PCIE1 will be disabled.

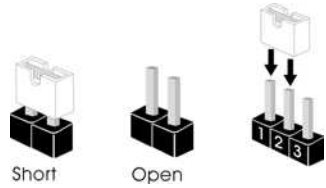
## Installing an expansion card

- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).
- Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5. Fasten the card to the chassis with screws.
- Step 6. Replace the system cover.

---

## 2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is “Short”. If no jumper cap is placed on pins, the jumper is “Open”. The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when jumper cap is placed on these 2 pins.

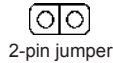


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### Clear CMOS Jumper

(2-pin CLRMOSS2)

(see p.8, No. 2)



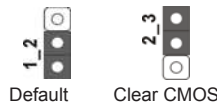
**Note:** CLRMOSS2 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord, then use a jumper cap to short the pins on CLRMOSS2 for 3 seconds. Please remember to remove the jumper cap after clearing the CMOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action.

---

### Clear CMOS Jumper

(3-pin CLRMOSS1)

(see p.8, No. 32)



**Note:** CLRMOSS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRMOSS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, user default profile and MAC address will be cleared only if the CMOS battery is removed.

---

### Digital Input / Output Power Select

(5-pin JGPIO\_PWR1)

(see p.8 No. 11)



1-2: +12V

2-3: +5V

3-4: +5V

4-5: GND

---

### ATX/AT Mode Select

(3-pin PWR\_JP1)

(see p.8 No. 22)



1-2: AT Mode

2-3: ATX Mode

---

### Panel Power Select (LCD\_VCC)

(5-pin PNL\_PWR1)

(see p.8 No. 10)



Use this to set up the VDD power of the LVDS connector.

1-2: LVDD: +3V

2-3: LVDD: +5V

4-5: LVDD: +12V

---

### Backlight Power Select

(LCD\_BLT\_VCC)

(5-pin BKT\_PWR1)

(see p.8 No. 19)



Use this to set up the backlight power of the LVDS connector and the panel backlight power of BLT\_PWM1.

1-2: LCD\_BLT\_VCC: +5V

2-3: LCD\_BLT\_VCC: +12V

4-5: LCD\_BLT\_VCC: DC\_IN

---

### Backlight Control Level (CON\_LBKLT\_CTL)

(3-pin BLT\_PWM1)

(see p.8, No. 6)



1-2: +3V Level

2-3: +5V Level

---

### COM Port PWR Setting Jumpers

(3-pin PWR\_COM1, for COM Port1)

(3-pin PWR\_COM2, for COM Port2)

(3-pin PWR\_COM3, for COM Port3)

(see p.8, No. 35)



1-2: +5V

2-3: +12V

---

(3-pin PWR\_COM4, for COM Port4)

(3-pin PWR\_COM5, for COM Port5)

(3-pin PWR\_COM6, for COM Port6)

(see p.8, No. 14)



1-2: +5V

2-3: +12V

---

### USB Power Setting Jumpers

(3-pin USB2\_PWR\_H1, USB2\_PWR\_H2)

(see p.8, No. 29)



1-2: +5V

2-3: +5VSB

---

(3-pin USB3\_PWR\_H1, USB3\_PWR\_H2)

(see p.8, No. 33)



1-2: +5V

2-3: +5VSB

---

---

Digital Input / Output Default Value Setting

(3-pin JGPIO\_SET1)

(see p.8, No. 18)



1-2: Pull-High

2-3: Pull-Low

---

EDP\_LVDS Jumpers

(3-pin EDP\_LVDS\_J1, EDP\_LVDS\_J2)

(see p.8, No. 1)



1-2: eDP

2-3: LVDS

---

USB6\_S\_MPCIE1, USB6\_S\_MPCIE2

(2-pin USB6\_S\_MPCIE1, USB6\_S\_MPCIE2)

(see p.8, No. 31)



USBPort5\_S\_Mini-PCIE Slot:

Open: USB2.0 Connector

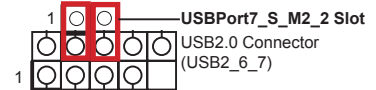
Short: Mini-PCIE Function



USBPort7\_S\_M2\_2 Slot:

Open: USB2.0 Connector

Short: M2\_2 slot Function





## 2.6 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

### SATA3 Connector

(SATA3\_1: see p.8, No. 24)



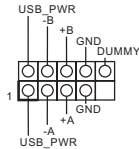
### This Serial ATA3

(SATA3) connector supports SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

### USB 2.0 Connectors

(9-pin USB2\_4\_5, USB2\_6\_7)

(see p.8 No. 30)



### There are two USB 2.0

connectors on this motherboard. Each USB 2.0 connector can support two USB ports.

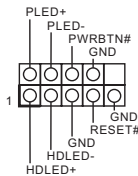


USB2\_6\_7 is shared with MINI\_PCIE1. If you use USB2\_6\_7 connector, the USB device on MINI\_PCIE1 will be disabled.

### System Panel Header

(9-pin PANEL1)

(see p.8 No. 13)



This header accommodates several system front panel functions.



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

#### **PWRBTN (Power Switch):**

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

#### **RESET (Reset Switch):**

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

### PLED (System Power LED):

Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

### HDLED (Hard Drive Activity LED):

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

### 3W Audio AMP Output Wafer

(4-pin SPEAKER1)

(see p.8 No. 26)

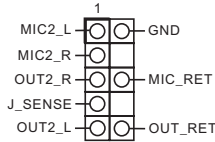


PIN	Signal Name
1	OUTLN
2	OUTLP
3	OUTRP
4	OUTRN

### Front Panel Audio Header

(9-pin HD\_AUDIO1)

(see p.8 No. 28)



This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

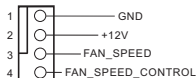


1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.
2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
  - A. Connect Mic\_IN (MIC) to MIC2\_L.
  - B. Connect Audio\_R (RIN) to OUT2\_R and Audio\_L (LIN) to OUT2\_L.
  - C. Connect Ground (GND) to Ground (GND).
  - D. MIC\_RET and OUT\_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
  - E. To activate the front mic.  
Go to the "FrontMic" Tab in the Realtek Control panel. Adjust "Recording Volume".

### Chassis Fan Connector

(4-pin CHA\_FAN1)

(see p.8 No. 15)

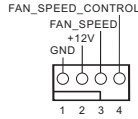


Please connect the fan cable to the fan connector and match the black wire to the ground pin.

### CPU Fan Connector

(4-pin CPU\_FAN1)

(see p.8 No. 3)



Please connect the CPU fan cable to the connector and match the black wire to the ground pin.



Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.

Pin 1-3 Connected ←

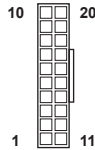


3-Pin Fan Installation

### ATX Power Connector

(20-pin ATXPWR1)

(see p.8 No. 12)



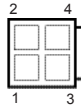
Please connect an ATX power supply to this connector.

### ATX Power Connector

(Input 12V-24V)

(4-pin ATX12V1)

(see p.8 No. 4)



Please connect a DC 12V-24V power supply to this connector.

1-2: GND

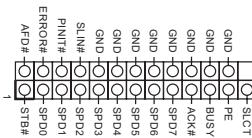
3-4: DC Input

### Printer Port / GPIO Header

(25-pin LPT\_GPIO1)

(see p.8 No. 20)

Printer Port:



GPIO:

Pin#	Signal Name	Pin#	Signal Name
2	SIO_GP46	1	SIO_GP47
4	SIO_GP45	3	SIO_GP42
6	SIO_GP44	5	SIO_GP41
8	SIO_GP43	7	SIO_GP40
10	JGPIO_PWR	9	SIO_GP37
12	JGPIO_PWR	11	SIO_GP36
14	GND	13	SIO_GP35
16	GND	15	SIO_GP34
18	GND	17	SIO_GP33
20	GND	19	SIO_GP32
22	GND	21	SIO_GP31
24	GND	23	SIO_GP30
26	NC	25	NA

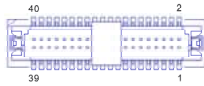
Parameter	Range
GPIO input Low Voltage	Max. 0.8V
GPIO input High Voltage	Min. 2.0V
GPIO output Low Voltage	Max. 0.4V
GPIO output High Voltage	Min. 2.4V
Note :	
Max. load per GPIO pin : 12mA	
Current Max. 1A per power pin.	

\* If you want to use the printer port function, please short pin4 and pin5 on Digital Input / Output Power Select (JGPIO\_PWR1).

## LVDS Connector

(40-pin LVDS1)

(see p.8 No. 5)



PIN	Signal Name	PIN	Signal Name
2	LCD_VCC	1	LCD_VCC
4	LDDC_CLK	3	+3.3V
6	LVDS_A_DATA#	5	LDDC_DATA
8	GND	7	LVDS_A_DATA0
10	LVDS_A_DATA1	9	LVDS_A_DATA1#
12	LVDS_A_DATA#	11	GND
14	GND	13	LVDS_A_DATA2
16	LVDS_A_DATA3	15	LVDS_A_DATA3#
18	LVDS_A_CLK#	17	GND
20	GND	19	LVDS_A_CLK
22	LVDS_B_DATA0	21	LVDS_B_DATA0#
24	LVDS_B_DATA1#	23	GND
26	GND	25	LVDS_B_DATA1
28	LVDS_B_DATA2	27	LVDS_B_DATA2#
30	LVDS_B_DATA#	29	DPVD0_EN
32	GND	31	LVDS_B_DATA3
34	LVDS_B_CLK	33	LVDS_B_CLK#
36	CON_LBRLT_EN	35	GND
38	LCD_BLT_VCC	37	CON_LBRLT_CTL
40	LCD_BLT_VCC	39	LCD_BLT_VCC

## Backlight Volume Control

(7-pin BLT\_VOL1)

(see p.8 No. 8)



PIN	Signal Name
1	GPIO_VOL_UP
2	GPIO_VOL_DW
3	PWRDN
4	LVDS1_BLUP
5	LVDS1_BLDW
6	GND
7	GND

## Backlight Power Connector

(6-pin BLT\_PWR1)

(see p.8 No. 9)



PIN	Signal Name
1	GND
2	GND
3	BL CTL
4	BL EN
5	LCD_BLT_VCC
6	LCD_BLT_VCC

## SATA Power Output Connector

(4-pin SATA\_PWR1)

(see p.8 No. 23)



## Buzzer Header

(2-pin BUZZ2)

(see p.8, No. 16)



## Chassis Intrusion Headers

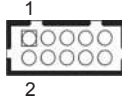
(2-pin C11, C12: see p.8, No. 21)



This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

### COM4, 5, 6 Headers (RS232)

(10-pin COM4/COM5/COM6: see p.8, No. 17)

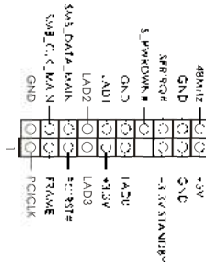


PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	DDCD#	3	TTXD	5	GND	7	RRTS#	9	+5V
2	RRXD	4	DDTR#	6	DDSR#	8	CCTS#	10	+12V

### LPC Header

(19-pin LPC1)

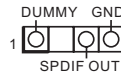
(see p.8, No. 25)



This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

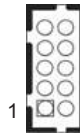
### SPDIF Header

(3-pin SPDIF1: see p.8, No. 27)



### VGA Header

(10-pin VGA1: see p.8, No. 34)



PIN	Signal Name	PIN	Signal Name
9	DDC_CLK	10	DDC_DATA
7	HSYNC	8	VSYNC
5	BLUE	6	GND
3	GREEN	4	GND
1	RED	2	GND

### BL1, BL2

(2-pin BL1, BL2: see p.8, No. 7)



---

## Chapter 3: UEFI SETUP UTILITY

### 3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure your system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

#### 3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

- |                    |   |
|--------------------|---|
| <b>Main</b>        | To set up the system time/date information                                  |
| <b>Advanced</b>    | To set up the advanced UEFI features  |
| <b>H/W Monitor</b> | To display current hardware status  |
| <b>Security</b>    | To set up the security features   |
| <b>Boot</b>        | To set up the default system device to locate and load the Operating System |
| <b>Exit</b>        | To exit the current screen or the UEFI SETUP UTILITY                        |

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

---

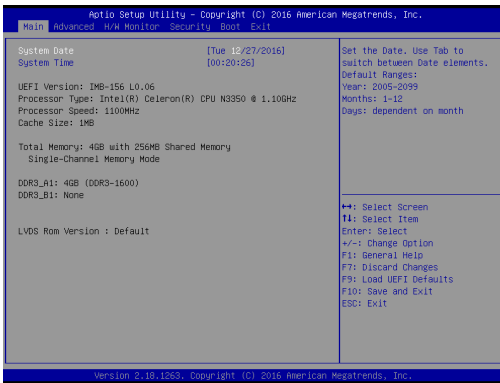
### 3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F7>	Discard changes
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	To jump to the Exit Screen or exit the current screen

### 3.2 Main Screen

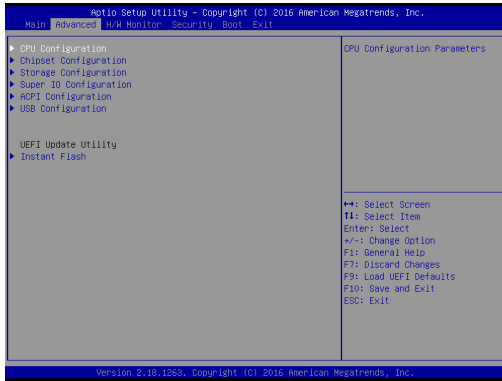
When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.



---

### 3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, ACPI Configuration and USB Configuration.



Setting wrong values in this section may cause the system to malfunction.

#### Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.



---

### 3.3.1 CPU Configuration



#### Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® OS and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.



Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

#### CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

#### Enhanced Halt State (C1E)

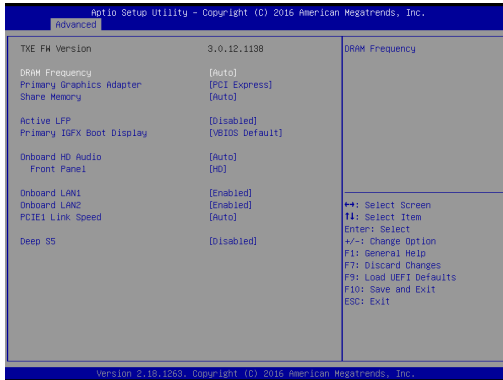
Enable Enhanced Halt State (C1E) for lower power consumption.

#### Intel Virtualization Technology

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

---

## 3.3.2 Chipset Configuration



### DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

### Primary Graphics Adapter

This allows you to select [Onboard] or [PCI Express] as the boot graphic adapter priority. The default value is [PCI Express].

### Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

### Active LFP

Use this to enable or disable the LFP. The default value is [Disabled].

### Primary IGFX Boot Display

Select a primary VGA.

### Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature.

#### Front Panel

Select [Auto] or [Disabled] for the onboard HD Audio Front Panel.

### Onboard LAN 1

This allows you to enable or disable the Onboard LAN 1 feature.

### Onboard LAN 2

This allows you to enable or disable the Onboard LAN 2 feature.

### PCIE1 Link Speed

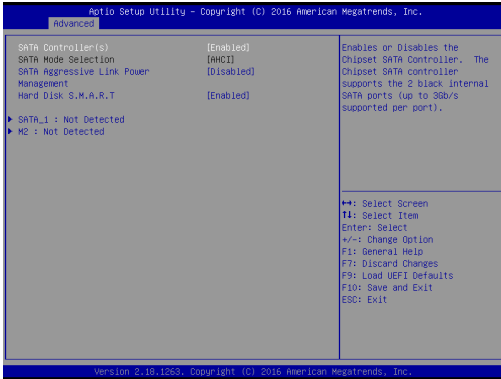
Select the link speed for PCIE1.

### Deep S5

Mobile platforms support Deep S5 in DC only and desktop platforms support Deep S5 in AC only. The default value is [Disabled].

---

### 3.3.3 Storage Configuration



#### SATA Controller(s)

Use this item to enable or disable the SATA Controller feature.

#### SATA Mode Selection

Use this to select SATA mode. Configuration options: [IDE Mode], [AHCI Mode] and [Disabled]. The default value is [AHCI Mode].



AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

#### Aggressive Link Power Management

Use this item to configure Aggressive Link Power Management.

#### Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

---

### 3.3.4 Super IO Configuration



#### Serial Port1

Use this to enable or disable COM1.

#### Type Select

Use this to select COM1 port type: [RS232], [RS422] or [RS485].

#### Serial Port2

Use this to enable or disable COM2.

#### Type Select

Use this to select COM2 port type: [RS232], [RS422] or [RS485].

#### Serial Port3

Use this to enable or disable COM3.

#### Type Select

Use this to select COM3 port type: [RS232], [RS422] or [RS485].

#### Serial Port4

Use this to enable or disable COM4.

#### Serial Port5

Use this to enable or disable COM5.

#### Serial Port6

Use this to enable or disable COM6.

#### COM Port IQR Port

Use this set COM port IQR port.

#### Parallel Port

Enable or disable the Parallel port.

#### Device Mode

Select the device mode according to your connected device.

#### Change Settings

Select the address of the Parallel port.

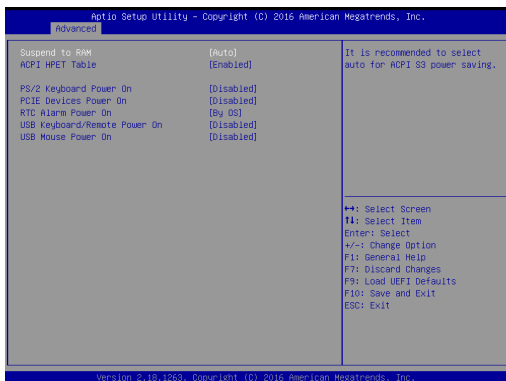
---

### **WDT Timeout Reset**

This allows users to enable/disable the Watch Dog Timer timeout to reset system. The default value is [Disabled].

---

### 3.3.5 ACPI Configuration



#### **Suspend to RAM**

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

#### **ACPI HPET Table**

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

#### **PS/2 Keyboard Power On**

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

#### **PCIe Devices Power On**

Use this item to enable or disable PCIe devices to turn on the system from the power-soft-off mode.

#### **RTC Alarm Power On**

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

#### **USB Keyboard/Remote Power On**

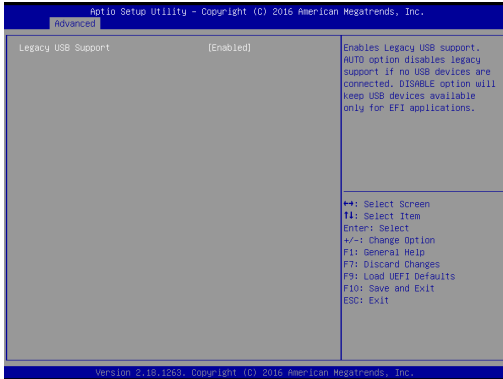
Use this item to enable or disable USB Keyboard/Remote to power on the system.

#### **USB Mouse Power On**

Use this item to enable or disable USB Mouse to power on the system.

---

### 3.3.6 USB Configuration



#### Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto] and [UEFI Setup Only]. The default value is [Auto]. Please refer to below descriptions for the details of these four options:

[Enabled] - Enables support for legacy USB.

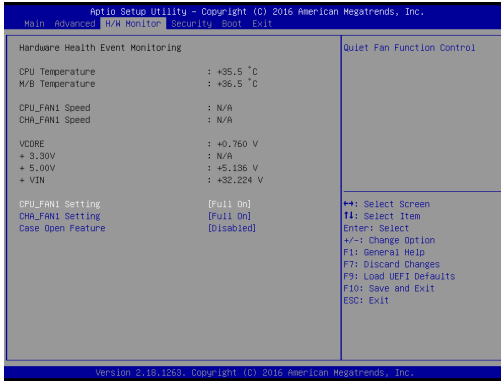
[Auto] - Enables legacy support if USB devices are connected.

[UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

---

### 3.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



#### CPU\_FAN1 Setting

This allows you to set CPU\_FAN1's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

#### CHA\_FAN1 Setting

This allows you to set CHA\_FAN1's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

#### Case Open Feature

This allows you to enable or disable case open detection feature. The default is value [Disabled].

#### Clear Status

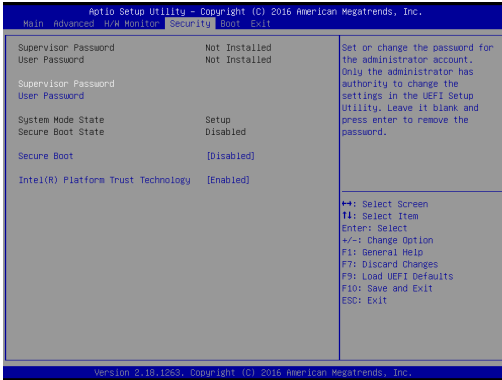
This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.



---

## 3.5 Security Screen

In this section, you may set, change or clear the supervisor/user password for the system.



### Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

### User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

### Secure Boot

Enable to support Windows 8 / 8.1 64-bit Secure Boot.

### Intel(R) Platform Trust Technology

Enable/disable Intel PTT in ME. Disable this option to use discrete TPM Module.

---

## 3.6 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



### Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

### Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key.

### Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

### Boot Beep

Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed.

### Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

---

## CSM (Compatibility Support Module)



### CSM

Enable to launch the Compatibility Support Module. Please do not disable unless you're running a WHCK test. If you are using Windows 8 / 8.1 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed.

### Launch PXE OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

### Launch Storage OpROM Policy

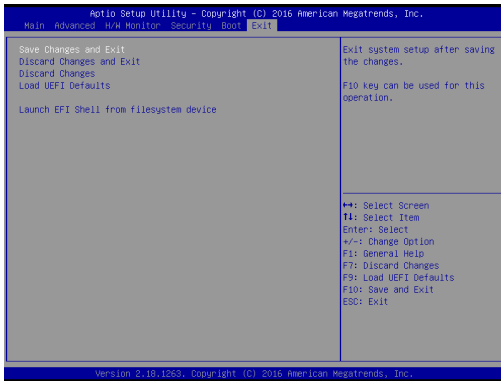
Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

### Launch Video OpROM Policy

Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.

---

## 3.7 Exit Screen



### Save Changes and Exit

When you select this option, it will pop-out the following message, “Save configuration changes and exit setup?” Select [OK] to save the changes and exit the UEFI SETUP UTILITY.

### Discard Changes and Exit

When you select this option, it will pop-out the following message, “Discard changes and exit setup?” Select [OK] to exit the UEFI SETUP UTILITY without saving any changes.

### Discard Changes

When you select this option, it will pop-out the following message, “Discard changes?” Select [OK] to discard all changes.

### Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

### Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.

---

# Chapter 4: Software Support

## 4.1 Install Operating System

This motherboard supports Microsoft® Windows® operating systems: 10 32-bit / 10 64-bit / 8.1 64-bit / 8 64-bit / 7 32-bit / 7 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

## 4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

### 4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASRSETUP.EXE" from the BIN folder in the Support CD to display the menus.

### 4.2.2 Drivers Menu

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

### 4.2.3 Utilities Menu

The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

### 4.2.4 Contact Information

If you need to contact ASRock or want to know more about ASRock, you're welcome to visit ASRock's website at <http://www.asrock.com>; or you may contact your dealer for further information.