ASRock®

IMB-1710

User Manual

Version 1.1
Updated September 8, 2020
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Disclaimer:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.
"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

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HIGH-DEFINITION MULTIMEDIA INTERFACE

CAUTION:

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

Contents

Chapter 1: Introduction

Thank you for purchasing ASRock *IMB-1710* 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

1.1 Package Contents

ASRock *IMB-1710* Motherboard (ATX (12-in x 9.6-in))
ASRock *IMB-1710* Driver CD
ASRock *IMB-1710* Jumper setting instruction
1 x I/O Panel Shield

1.2 Specifications

Form Factor	Dimensions	ATX (12-in x 9.6-in)
Processor System	CPU	Socket LGA 1151 for 9th/8th Intel® Core i7/i5/i3/ Celeron (Supports up to 95W)
	Chipset	Intel® Q370
Expansion Slot	PCIe	1 x PCIe x16 (Suppot x16/x8/x4 switch), 1 x PCIe x 8, 3 x PCIe x4, 2 x PCIe x1
	Mini-PCIe	1 x Full/Half with PCIe x1 and USB 2.0
	M.2	1 x M.2 (Key E, 2230) with PCIe x1, CNVI and USB2.0 for Wireless 1 x M.2 (Key M, 2242/2260/2280) with PCIe x4 and shared SATA3 for SSD
Memory	Technology	Dual Channel DDR4 2400/2666 MHz
	Max.	128GB* * Intel® Core i9/i7/i5 CPUs support up to 128GB (32GB per DIMM) Intel® Core i3/Pentium®/Celeron® CPUs support up to 64GB (16GB per DIMM)
	Socket	4 x LONG-DIMM
Graphics	VGA	Max resolution up to 1920x1200 @60Hz
	DVI	N/A
	LVDS	N/A
	eDP	N/A
	HDMI	Max resolution up to 4096x2160 @24Hz
	DisplayPort	Max resolution up to 4096x2304 @60Hz
	Multi Display	Triple Display
Ethernet	Ethernet	10/100/1000 Mbps
	Controller	1 x Intel I210, 1 x Intel I219LM
Rear I/O	VGA	1
	DVI	N/A
	HDMI	1
	DisplayPort	2
	Ethernet	2
	USB	4 x USB3.1
	Serial	2 x COM (RS-232/422/485)
	Audio Jack	3 (Mic-in, Line-out, Line-in)
	PS/2	1 x PS/2 Combo

Internal Connector	USB	2 x USB3.1, 6 x USB2.0
	LVDS	N/A
	eDP	N/A
	VGA	N/A
	Serial	8 x COM (RS-232)
	SATA	6 x SATA3 (6.0Gb/s), one is shared with M.2
	GPIO	8 x GPI, 8 x GPO
	Speaker Header	1
	TPM	1 x Onboard IC
Watchdog Timer	Output	From super I/O to drag RESETCON#
	Interval	256 Segments, 0,1, 2…255 Sec
Power Requirements	Input PWR	ATX PWR 24+8-pin
	Power On	AT/ATX Supported AT: Directly PWR on as Power input ready ATX: Press Button to PWR on after Power input ready
Environment	Operating Temp	0ºC – 60ºC
	Storage Temp	-40ºC – 85ºC

1.3 Motherboard Layout
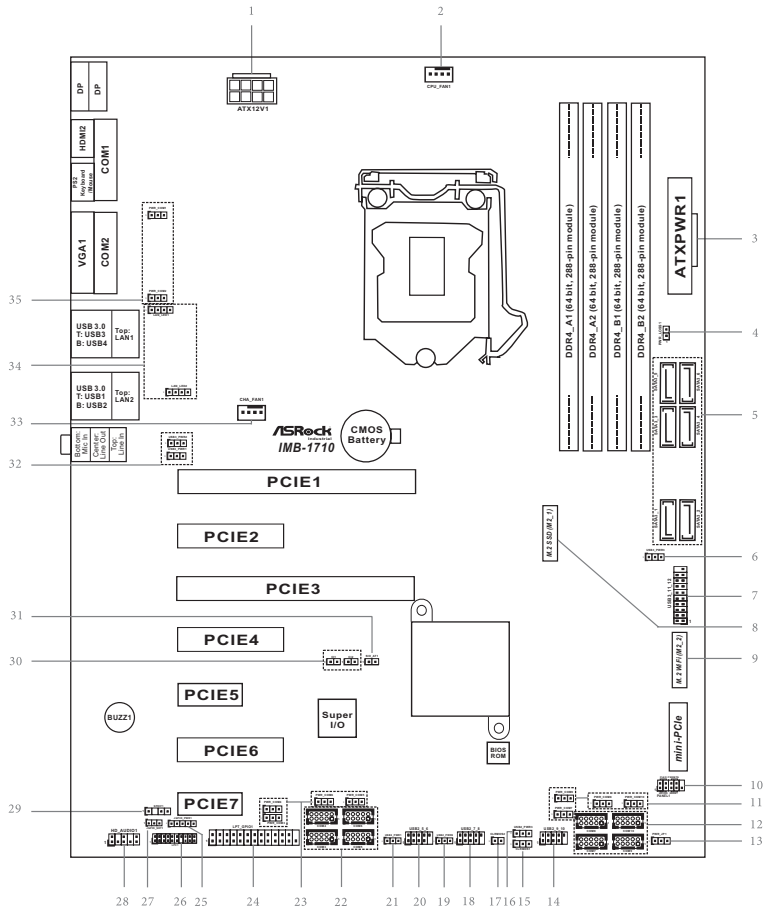
1 : ATX 12V Power Connector
2 : CPU FAN Connector (+12V)
3 : 24-pin ATX Power Input Connector
4 : PWR LOSS Header (PWR_LOSS1)
5 : SATA3 Connectors (SATA3_1 ~ SATA3_6)
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    PWR_COM6 (For COM Port6)
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    LAN_LED2 (For LAN2 Port)
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    PWR_COM1 (For COM Port1)
    PWR_COM2 (For COM Port2)

1.4 I/O Panel
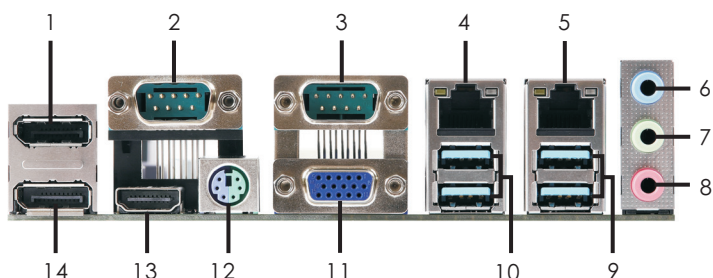
1	DisplayPort (DP1)	8	Microphone (Pink)
2	COM Port (COM1) (RS232/422/485)*	9	USB 3.1 Ports
3	COM Port (COM2) (RS232/422/485)*	10	USB 3.1 Ports
4	LAN RJ-45 Port**	11	D-Sub Port (VGA1)
5	LAN RJ-45 Port**	12	PS/2 Keyboard/Mouse Port
6	Line In (Light Blue)	13	HDMI Port (HDMI1)
7	Line Out (Lime)	14	DisplayPort (DP2)

* This motherboard supports RS232/422/485 on COM1, 2 ports. Please refer to below table for the pin definition. In addition, COM1, 2 ports (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

COM1, 2 Port Pin Definition

PIN	RS232	RS422	RS485
1	DCD, Data Carrier Detect	TX-	RTX-
2	RXD, Receive Data	RX+	N/A
3	TXD, Transmit Data	TX+	RTX+
4	DTR, Data Terminal Ready	RX-	N/A
5	GND	GND	GND
6	DSR, Data Set Ready	N/A	N/A
7	RTS, Request To Send	N/A	N/A
8	CTS, Clear To Send	N/A	N/A
9	No Power/5V/12V	N/A	N/A

** 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		SPEED LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection
Blinking	Data Activity	Orange	100Mbps connection
On	Link	Green	1Gbps connection

ACT/LINK SPEED
LED   LED

LAN Port
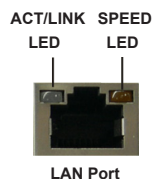
Chapter 2: Installation

This is an ATX form factor (12" x 9.6") motherboard. Before you install the mother-board, 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.

2.3 Installation of Memory Modules (DIMM)

This motherboard provides four 288-pin DDR4 (Double Data Rate 4) DIMM slots, and supports Dual Channel Memory Technology.

> 1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR4 DIMM pairs.
> 2. It is unable to activate Dual Channel Memory Technology with only one or three memory module installed.
> 3. It is not allowed to install a DDR, DDR2 or DDR3 memory module into a DDR4 slot; otherwise, this motherboard and DIMM may be damaged.

> The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.
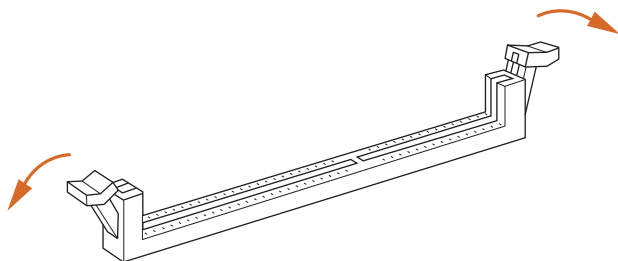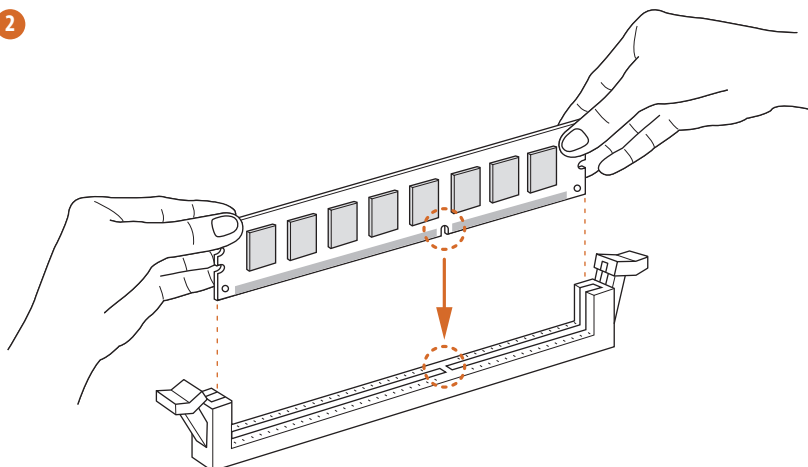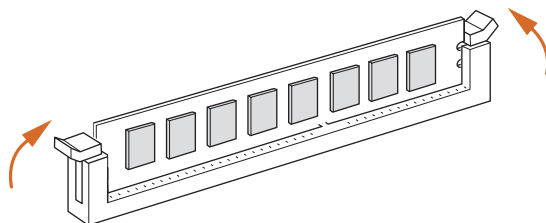
2.4 Expansion Slots

There are 1 mini-PCIe slot, 7 PCI Express slots and 2 M.2 sockets on this motherboard.

mini-PCIe slot:

MINI_PCIE1 (mini-PCIe slot; half size) is used for PCI Express mini cards.

PCIE slots: PCIE1 (PCIE x16 slot) is used for PCI Express x16 lane width cards.
PCIE2 (PCIE x4 slot) is used for PCI Express x4 lane width cards.
PCIE3 (PCIE x16 slot) is used for PCI Express x8 lane width cards.
PCIE4 (PCIE x4 slot) is used for PCI Express x4 lane width cards.
PCIE5 (PCIE x1 slot) is used for PCI Express x1 lane width cards.
PCIE6 (PCIE x4 slot) is used for PCI Express x4 lane width cards.
PCIE7 (PCIE x1 slot) is used for PCI Express x1 lane width cards.
* PCIE2 and PCIE3 are shared with PCIE1.

3 OPTIONS FOR PCIE SLOT 1~3			
Slot1	x16	x8	x8
Slot2	0	0	x4
Slot3	0	x8	x4

M.2 socket:

1 x M.2 (Key E, 2230) with PCIe x1, CNVI and USB2.0 for Wireless.
1 x M.2 (Key M, 2242/2260/2280) with PCIe x4 and shared SATA3 for SSD.

M.2 Key-M Socket (M2_1)

Pin	Signal	Signal	Pin
1	GND	+3.3V	2
3	GND	+3.3V	4
5	NA	NA	6
7	NA	NA	8
9	GND	SATA_LED	10
11	NA	+3.3V	12
13	NA	+3.3V	14
15	GND	+3.3V	16
17	NA	+3.3V	18
19	NA	NA	20
21	GND	NA	22
23	NA	NA	24
25	NA	NA	26
27	GND	NA	28
29	NA	NA	30
31	NA	NA	32
33	GND	NA	34
35	NA	NA	36
37	NA	DEVSLP	38
39	GND	SMB_CLK	40
41	SATA-B+	SMB_DATA	42
43	SATA-B-	NA	44
45	GND	NA	46
47	SATA-A-	NA	48
49	SATA-A+	PERST#	50
51	GND	CLKREQ#	52
53	PEFCLKn	WAKE#	54
55	PEFCLKp	NA	56
57	GND	NA	58
67	NA	NA	68
69	PEDET	+3.3V	70
71	GND	+3.3V	72
73	GND	+3.3V	74
75	GND		

M.2 Key-E Socket (M2_2)

Pin	Signal	Signal	Pin
1	GND	+3.3V	2
3	USB_D+	+3.3V	4
5	USB_D-	NA	6
7	GND	NA	8
9	CNV_WGR_D1-	CNV_RF_RESET	10
11	CNV_WGR_D1+	NA	12
13	GND	MODEM_CLKREQ	14
15	CNV_WGR_D0-	NA	16
17	CNV_WGR_D0+	GND	18
19	GND	NA	20
21	CNV_WGR_CLK-	CNV_BRI_RSP	22
23	CNV_WGR_CLK+		
33	GND	CNV_BGI_DT	32
35	PETp	CNV_RGI_RSP	34
37	PETn	CNV_BRI_DT	36
39	GND	NA	38
41	PERp	NA	40
43	PERn	NA	42
45	GND	NA	44
47	PEFCLKp	NA	46
49	PEFCLKn	NA	48
51	GND	SUSCLK	50
53	CLKREQ#	PERST0#	52
55	WAKE#	W_DISABLE1#	54
57	GND	W_DISABLE2#	56
59	CNV_WT_D1-	SMB_DATA	58
61	CNV_WT_D1+	SMB_CLK	60
63	GND	NA	62
65	CNV_WT_D0-	CLKIN_XTAL_LCP	64
67	CNV_WT_D0+	NA	66
69	GND	NA	68
71	CNV_WT_CLK-	NA	70
73	CNV_WT_CLK+	+3.3V	72
75	GND	+3.3V	74

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.

Short   Open
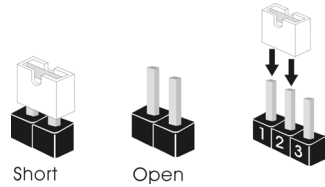
Jumper	Setting	Description
Clear CMOS Jumpers (3-pin CLRMOS1) (see p.8, No. 15)	**1_2** Default **2_3** Clear CMOS	CLRMOS1 : 1-2 : Normal 2-3 : Clear CMOS

Note: CLRMOS1 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 CLRMOS1 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.

(2-pin CLRMOS2) (see p.8, No. 17)	1	CLRMOS2 : Open : Normal Short : Auto Clear CMOS (Power Off)

Note: CLRMOS2 allows you to clear the data in CMOS automatically when AC power on. 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 CLRMOS2.

Digital Input / Output Power Select (JGPIOPWR) (5-pin JGPIO_PWR1) (see p.8, No. 25)	1	1-2 : +12V 2-3 : +5V 3-4 : +5V 4-5: GND

COM Port Pin9 PWR Setting Jumpers   1-2 : +5V

(3-pin PWR_COM7~10 (For COM Port7~10))   2-3 : +12V

(see p.8, No. 11)

1 2 3

(3-pin PWR_COM3~6 (For COM Port3~6))
(see p.8, No. 23)

(3-pin PWR_COM1~2 (For COM Port1~2))
(see p.8, No. 35)

PWR LOSS Header   Short : Power Loss

(2-pin PWR_LOSS1)   Open : no Power Loss

(see p.8, No. 14)

GND   +5VSB_ATX

1

ATX/AT Mode Jumper   Open : ATX Mode

(2-pin SIO_AT1)   Close : AT Mode

(see p.8, No. 31)

1

Chassis Intrusion Headers   This motherboard supports

(2-pin CI1, CI2: see p.8, No. 30)   CASE OPEN detection feature

1   that detects if the chassis cover

GND   has been removed. This feature

Signal   requires a chassis with chassis

intrusion detection design.

CI1 :

Close : Active Case Open

Open : Normal

CI2 :

Close : Normal

Open : Active Case Open

Digital Input / Output Default Value Setting   1-2 : Pull-High

(3-pin JGPIO_SET1)   2-3 : Pull-Low

(see p.8, No. 27)

1 2 3

USB Power Setting Jumpers   1-2 : +5V

(3-pin USB3_PWR3 (For USB3_5_6),   □ ○ ○   2-3 : +5VSB
(see p.8, No. 6)   1   2   3

(3-pin USB2_PWR3 (For USB2_9_10),
(see p.8, No. 16)

(3-pin USB2_PWR2 (For USB2_7_8),
(see p.8, No. 19)

(3-pin USB2_PWR1 (For USB2_5_6),
(see p.8, No. 21)

(3-pin USB3_PWR1 (For USB3_1_2),
USB3_PWR2 (For USB3_3_4))
(see p.8, No. 32)

ATX/AT Mode Jumper   1-2 : AT Mode

(3-pin PWR_JP1)   □ ○ ○   2-3 : ATX Mode
(see p.8, No. 13)   1   2   3

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!

CPU Fan Connector

(4-pin CPU_FAN1)

(see p.8 No. 2)

4 3 2 1

GND
+12V
CPU_FAN_SPEED
FAN_SPEED_CONTROL
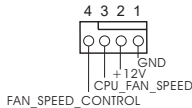
Please connect the CPU fan cable to the connector and match the black wire to the ground pin.

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.

Chassis Fan Connector

(4-pin CHA_FAN1)

(see p.8 No. 33)

4 3 2 1

FAN_SPEED_CONTROL
CHA_FAN_SPEED
+12V
GND
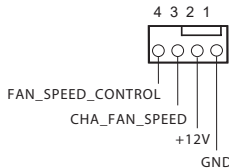
Please connect the fan cable to the fan connector and match the black wire to the ground pin.

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

System Panel Header

(9-pin PANEL1)

(see p.8, No. 10)

PLED+
PLED-
PWRBTN#
GND

1

GND
RESET#
GND
HDLED-
HDLED+
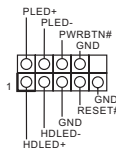
This header accommodates several system front panel functions.

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/S3 sleep state. The LED is off when the system is in 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 assign-ments are matched correctly.

COM Port Headers (RS232)

(10-pin COM3~6: see p.8, No. 22)

(10-pin COM7~10: see p.8, No. 12)
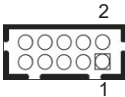
PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
10	N/A	8	CCTS#	6	DDSR#	4	DDTR#	2	RRXD
9	+5V	7	RRTS#	5	GND	3	TTXD	1	DDCD#

SATA3 Connectors

(SATA3_1~6: see p.8, No. 5)

These six Serial ATA3 (SATA3) connectors support SATA data cables for internal storage devices. The current SATA3 interface allows up to 6.0 Gb/s data transfer rate.

USB 2.0 Headers

(9-pin USB2_9_10: see p.8, No. 14)

(9-pin USB2_7_8: see p.8, No. 18)

(9-pin USB2_5_6: see p.8, No. 20)
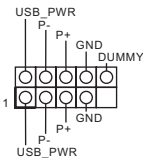
There are three headers on this motherboard. Each USB 2.0 header can support two ports.

USB 3.0 Header

(19-pin USB3_11_12: see p.8, No. 7)

```
                        Vbus
          Vbus         IntA_P1_SSRX-
   IntA_P0_SSRX-       IntA_P1_SSRX+
   IntA_P0_SSRX+       GND
          GND          IntA_P1_SSTX-
   IntA_P0_SSTX-       IntA_P1_SSTX+
   IntA_P0_SSTX+       GND
          GND          IntA_P1_D-
     IntA_P0_D-        IntA_P1_D+
     IntA_P0_D+        ID
              1
```
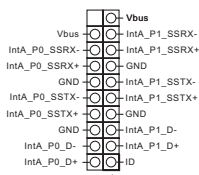
There is one header on this motherboard. Each USB 2.0 header can support two ports.

Front Panel Audio Header

(9-pin HD_AUDIO1)

(see p.8 No. 28)

```
   GND
      MIC_RET
         OUT_RET

    1
          OUT2_L
        J_SENSE
       OUT2_R
     MIC2_R
   MIC2_L
```
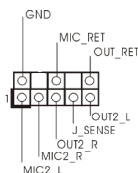
This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

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".

ATX 12V Power Connector

(8-pin ATX12V1)

(see p.8 No. 1)
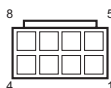
This motherboard provides an 8-pin ATX 12V power connector. To use a 4-pin ATX power supply, please plug it along Pin 1 and Pin 5.

ATX Power Input Connector

(24-pin ATXPWR1)

(see p.8 No. 3)
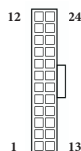
This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13.

Printer Port / GPIO Header

(25-pin LPT_GPIO1)

(see p.8 No. 24)

Printer Port:
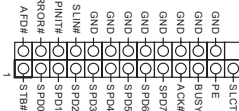
PIN	Signal Name	PIN	Signal Name
26	NC	25	NA
24	GND	23	SIO_GP70
22	GND	21	SIO_GP71
20	GND	19	SIO_GP72
18	GND	17	SIO_GP87
16	GND	15	SIO_GP86
14	GND	13	SIO_GP85
12	JGPIOPWR	11	SIO_GP84
10	JGPIOPWR	9	SIO_GP83
8	SIO_GP73	7	SIO_GP82
6	SIO_GP74	5	SIO_GP81
4	SIO_GP75	3	SIO_GP80
2	SIO_GP76	1	SIO_GP77

GPIO:

* If you want to use the printer port function, please short pin4 and pin5 on Digital Input / Output Power Select (JGPIO_PWR1).

LPC Header

(19-pin LPC1)

(see p.8, No. 26)

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. 29)

+5V   GND

SPDIF OUT
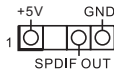
SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/ projector/LCD devices. Please connect the SPDIF connector of HDMI VGA card to this header.

LAN LED Headers

(4-pin LAN_LED1 (For LAN1 Port))

(4-pin LAN_LED2 (For LAN2 Port))

(see p.8, No. 34)

M.2 Key-M Socket (M2_1)

(see p.8, No. 8)

Pin	Signal	Signal	Pin
1	GND	+3.3V	2
3	GND	+3.3V	4
5	NA	NA	6
7	NA	NA	8
9	GND	SATA_LED	10
11	NA	+3.3V	12
13	NA	+3.3V	14
15	GND	+3.3V	16
17	NA	+3.3V	18
19	NA	NA	20
21	GND	NA	22
23	NA	NA	24
25	NA	NA	26
27	GND	NA	28
29	NA	NA	30
31	NA	NA	32
33	GND	NA	34
35	NA	NA	36
37	NA	DEVSLP	38
39	GND	SMB_CLK	40
41	SATA-B+	SMB_DATA	42
43	SATA-B-	NA	44
45	GND	NA	46
47	SATA-A-	NA	48
49	SATA-A+	PERST#	50
51	GND	CLKREQ#	52
53	PEFCLKn	WAKE#	54
55	PEFCLKp	NA	56
57	GND	NA	58
67	NA	NA	68
69	PEDET	+3.3V	70
71	GND	+3.3V	72
73	GND	+3.3V	74
75	GND		

M.2 Key-E Socket (M2_2)

(see p.8, No. 9)

Pin	Signal	Signal	Pin
1	GND	+3.3V	2
3	USB_D+	+3.3V	4
5	USB_D-	NA	6
7	GND	NA	8
9	CNV_WGR_D1-	CNV_RF_RESET	10
11	CNV_WGR_D1+	NA	12
13	GND	MODEM_CLKREQ	14
15	CNV_WGR_D0-	NA	16
17	CNV_WGR_D0+	GND	18
19	GND	NA	20
21	CNV_WGR_CLK-	CNV_BRI_RSP	22
23	CNV_WGR_CLK+		
33	GND	CNV_BGI_DT	32
35	PETp	CNV_RGI_RSP	34
37	PETn	CNV_BRI_DT	36
39	GND	NA	38
41	PERp	NA	40
43	PERn	NA	42
45	GND	NA	44
47	PEFCLKp	NA	46
49	PEFCLKn	NA	48
51	GND	SUSCLK	50
53	CLKREQ#	PERST0#	52
55	WAKE#	W_DISABLE1#	54
57	GND	W_DISABLE2#	56
59	CNV_WT_D1-	SMB_DATA	58
61	CNV_WT_D1+	SMB_CLK	60
63	GND	NA	62
65	CNV_WT_D0-	CLKIN_XTAL_LCP	64
67	CNV_WT_D0+	NA	66
69	GND	NA	68
71	CNV_WT_CLK-	NA	70
73	CNV_WT_CLK+	+3.3V	72
75	GND	+3.3V	74

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:

Main   To set up the system time/date information

Advanced   To set up the advanced UEFI features

H/W Monitor   To display current hardware status

Security   To set up the security features

Boot   To set up the default system device to locate and load the
                  Operating System

Exit   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.
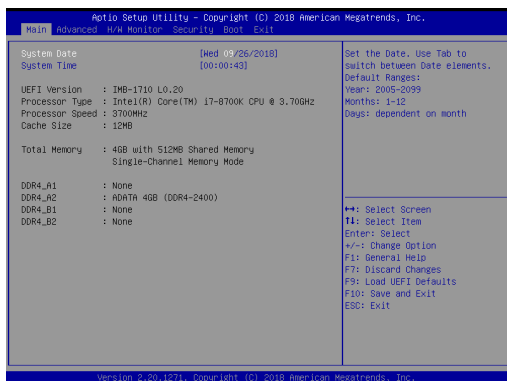
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, AMT Configuration, ACPI Configuration, USB Configuration and Trusted Computing.
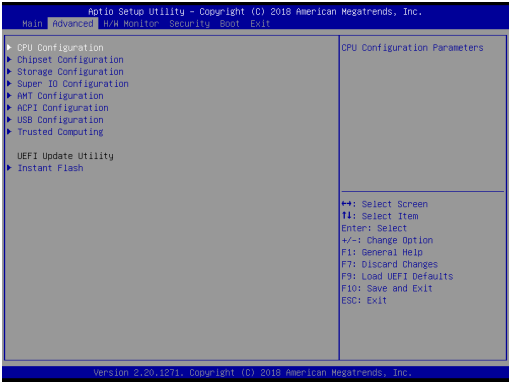
Setting wrong values in this section may cause the system to malfunction.

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

```
 Advanced

Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz          Intel Hyper Threading
Microcode Revision          906EA 96              Technology allows multiple
Max CPU Speed               3700 MHz              threads to run on each core,
Min CPU Speed               800 MHz               so that the overall
Processor Cores            6                      performance on threaded
                                                  software is improved.
Intel Hyper Threading Technology   [Enabled]
Active Processor Cores             [All]
CPU C States Support               [Disabled]

Intel Virtualization Technology    [Enabled]
Intel SpeedStep Technology         [Enabled]
Intel Turbo Boost Technology       [Enabled]        →←: Select Screen
                                                    ↑↓: Select Item
CPU Thermal Throttling             [Enabled]        Enter: Select
                                                    +/-: Change Option
                                                    F1: General Help
                                                    F7: Discard Changes
                                                    F9: Load UEFI Defaults
                                                    F10: Save and Exit
                                                    ESC: Exit


            Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Active Processor Cores

Select the number of cores to enable in each processor package.

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.

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.

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.

Intel Turbo Boost Technology

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

CPU Thermal Throttling

You may select [Enabled] to enable CPU internal thermal control mechanism to keep the CPU from overheating.

3.3.2 Chipset Configuration

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
  Advanced

  ME Firmware Version          12.0.6.1120            Select a primary VGA.
  VT-d Capability              Supported

  Primary Graphics Adapter     [PCI Express]
  Above 4G Decoding            [Disabled]
  VT-d                         [Enabled]

  PCIE1 Link Speed             [Auto]
  PCIE2 Link Speed             [Auto]
  PCIE3 Link Speed             [Auto]
  PCIE4 Link Speed             [Auto]
  PCIE5 Link Speed             [Auto]
  PCIE6 Link Speed             [Auto]
  PCIE7 Link Speed             [Auto]                 ↔: Select Screen
                                                      ↑↓: Select Item
  PCIE2 Slot                   [Auto detection]       Enter: Select
                                                      +/-: Change Option
  Share Memory                 [Auto]                 F1: General Help
  IGPU Multi-Monitor           [Disabled]             F7: Discard Changes
                                                      F9: Load UEFI Defaults
  Onboard LAN1                 [Enabled]              F10: Save and Exit
  Onboard LAN2                 [Enabled]              ESC: Exit

  Onboard HD Audio             [Enabled]

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```

Primary Graphics Adapter

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

Above 4G Decoding

Enable or disable 64bit capable Devices to be decoded in Above 4G Address Space (only if the system supports 64 bit PCI decoding).

VT-d

Use this to enable or disable Intel® VT-d technology (Intel® Virtualization Technology for Directed I/O). The default value of this feature is [Disabled].

PCIE1 Link Speed

Select the link speed for PCIE1.

PCIE2 Link Speed

Select the link speed for PCIE2.

PCIE3 Link Speed

Select the link speed for PCIE3.

PCIE4 Link Speed

Select the link speed for PCIE4.

PCIE5 Link Speed

Select the link speed for PCIE5.

PCIE6 Link Speed

Select the link speed for PCIE6.

PCIE7 Link Speed

Select the link speed for PCIE7.

PCIE2 Slot

The default value is [Auto Detection].

Share Memory

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

IGPU Multi-Moniter

Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enabled at all times.

Onboard LAN1

This allows you to enable or disable the Onboard LAN1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN2 feature.

Onboard HD Audio

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

Deep Sleep

Mobile platforms support Deep S4/S5 in DC only and desktop platforms support Deep S4/S5 in AC only. The default value is [Disabled].

Restore on AC/Power Loss

Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.

3.3.3 Storage Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

  SATA Controller(s)                   [Enabled]                 Enable/disable the SATA
  SATA Mode Selection                  [AHCI]                    controllers.
  SATA Aggressive Link Power           [Disabled]
  Management
  Hard Disk S.M.A.R.T                  [Enabled]

▶ SATA3_1/M2_1: Not Detected
▶ SATA3_2: Not Detected
▶ SATA3_3: Not Detected
▶ SATA3_4: Not Detected
▶ SATA3_5: Not Detected
▶ SATA3_6: Not Detected

                                                                 ↔: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Option
                                                                 F1: General Help
                                                                 F7: Discard Changes
                                                                 F9: Load UEFI Defaults
                                                                 F10: Save and Exit
                                                                 ESC: Exit

              Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

SATA Controller(s)

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

SATA Mode Selection

Use this to select SATA mode. The default value is [AHCI Mode].

> AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance.

SATA Aggressive Link Power Management

Use this item to configure SATA 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
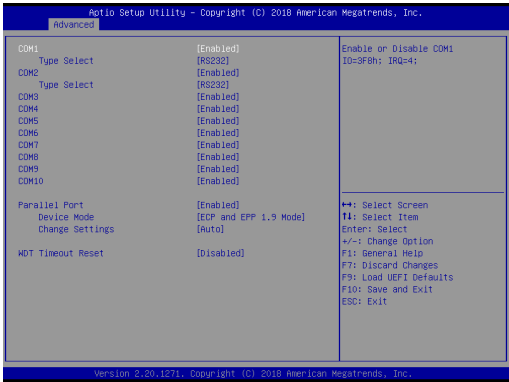
COM1 Configuration

Use this to set parameters of COM1.

COM2 Configuration

Use this to set parameters of COM2.

COM3 Configuration

Use this to set parameters of COM3.

COM4 Configuration

Use this to set parameters of COM4.

COM5 Configuration

Use this to set parameters of COM5.

COM6 Configuration

Use this to set parameters of COM6.

COM7 Configuration

Use this to set parameters of COM7.

COM8 Configuration

Use this to set parameters of COM8.

COM9 Configuration

Use this to set parameters of COM9.

COM10 Configuration

Use this to set parameters of COM10.

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

Use this to set the Watch Dog Timer.

3.3.5 AMT Technology
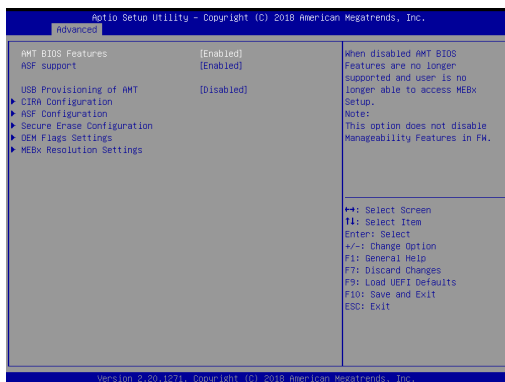
AMT BIOS Features

Use this to enable or disable Intel(R) Active Management Technology BIOS Extension. The default is [Enabled].

ASF support

Use this to enable or disable Alert Specification Format. The default is [Enabled].

USB Provisioning of AMT

Use this to enable or disable AMT USB Provisioning. The default is [Disabled].

Secure Erase mode

Change Secure Erase module behavior: Simulated: Performs SE flow without erasing SSD. Real: Erase SSD.

Force Secure Erase

Use this to enable or disable Force Secure Erase on next boot. The default is [Disabled].

MEBx hotkey Pressed

Use this to enable or disable MEBx hotkey press. The default is [Disabled].

MEBx Selection Screen

Use this to enable or disable MEBx Selection Screen. The default is [Disabled].

Hide Un-configure ME Confirmation Prompt

Hide Un-Configure ME without password confirmation prompt. The default is [Disabled].

MEBx OEM Debug Menu Enable

Use this to enable or disable MEBx OEM Debug Menu. The default is [Disabled].

Un-Configure ME

Un-Configure ME without password. The default is [Disabled].

WatchDog

Use this to enable or disable AMT WatchDog Timer. The default is [Disabled].

Activate Remote Assistance Process

Trigger CIRA boot. The default is [Disabled].

PET Progress

User can enable or disable PET Events progress to receive PET events or not. The default is [Enabled].

ASF Sensors Table

Use this to enable or disable ASF Sensor Table. The default is [Disabled].

Non-UI Mode Resolution

Use this to set resolution for non-UI text mode.

UI Mode Resolution

Use this to set resolution for UI text mode.

Graphics Mode Resolution

Use this to set resolution for graphics mode.

3.3.6 ACPI Configuration
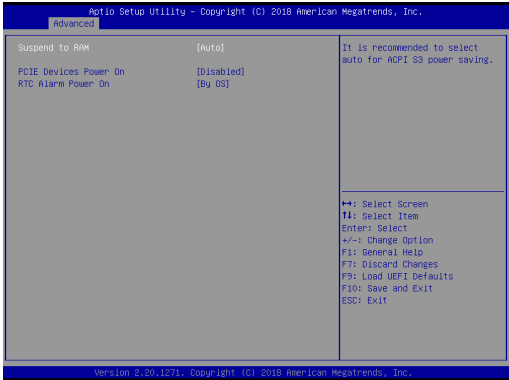
Suspend to RAM

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.

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.

3.3.7 USB Configuration
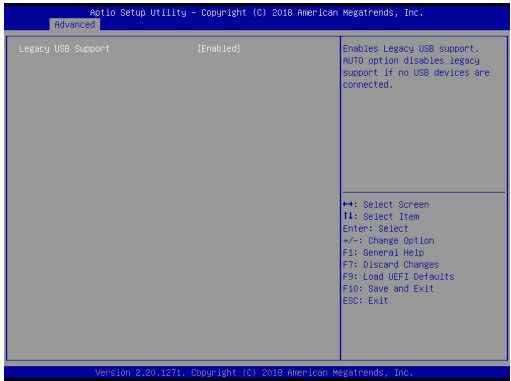
Legacy USB Support

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

[Enabled] - Enables support for legacy USB.

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

3.3.8 Trusted Computing

```
                 Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Advanced

    TPM20 Device Found                                      Enables or Disables BIOS
    Firmware Version:             7.62                      support for security device.
    Vendor:                       IFX                       O.S. will not show Security
                                                            Device. TCG EFI protocol and
    Security Device Support       [Enable]                  INT1A interface will not be
    Active PCR banks              SHA-1,SHA256              available.
    Available PCR banks           SHA-1,SHA256

    SHA-1 PCR Bank                [Enabled]
    SHA256 PCR Bank               [Enabled]

    Pending operation             [None]
    Platform Hierarchy            [Enabled]
    Storage Hierarchy             [Enabled]                 →←: Select Screen
    Endorsement Hierarchy         [Enabled]                 ↑↓: Select Item
    TPM2.0 UEFI Spec Version      [TCG_2]                   Enter: Select
    Physical Presence Spec Version [1.3]                    +/-: Change Option
    TPM 20 InterfaceType          [TIS]                     F1: General Help
    Device Select                 [Auto]                    F7: Discard Changes
                                                            F9: Load UEFI Defaults
    Onboard TPM                   [Enabled]                 F10: Save and Exit
                                                            ESC: Exit




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```

Security Device Support

Enable or disable BIOS support for security device.

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.
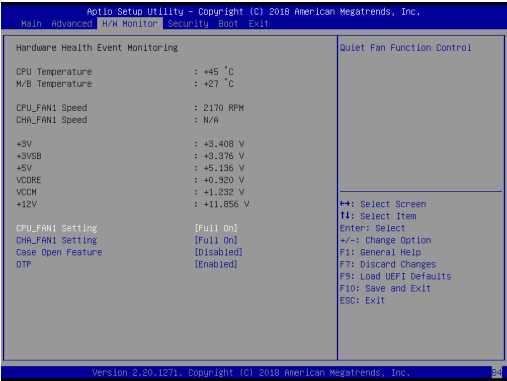
CPU_FAN1 Setting

This allows you to set CPU fan 1's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

CHA_FAN1 Setting

This allows you to set chassis fan 1'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.

Over Temperature Protection

When Over Temperature Protection is enabled, the system automatically shuts down when the motherboard is overheated.

3.5 Security Screen

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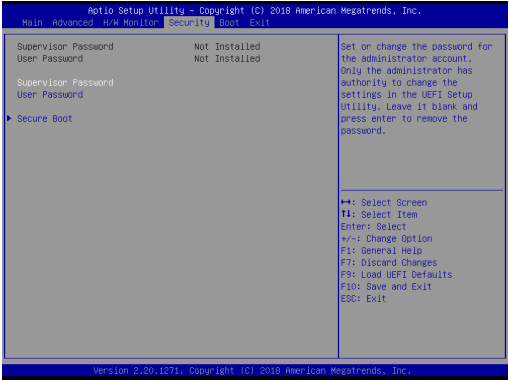
Supervisor Password

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

Use this item to enable or disable support for Secure Boot.

3.6 Boot Screen

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

```
                 Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
         Main  Advanced  H/W Monitor  Security  Boot  Exit

         Boot Option Priorities                           Boot From Onboard LAN

         Boot From Onboard LAN          [Disabled]

         Setup Prompt Timeout           1
         Bootup Num-Lock                [On]
         Full Screen Logo               [Disabled]

       ▶ CSM(Compatibility Support Module)
                                                          ↔: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Option
                                                          F1: General Help
                                                          F7: Discard Changes
                                                          F9: Load UEFI Defaults
                                                          F10: Save and Exit
                                                          ESC: Exit

                 Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

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.
65535(0XFFFF) means indefinite waiting.

Bootup Num-Lock

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

Full Screen Logo

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

CSM (Compatibility Support Module)

CSM

Use this to enable or disable Compatibility Support Module. The default value is [Disabled].

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.

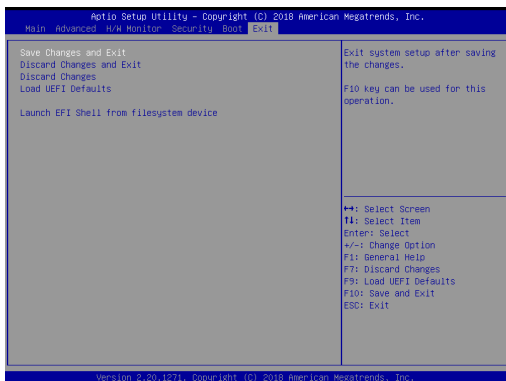**Launch Storage OpROM Policy**

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.

3.7 Exit Screen

```
                Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  H/W Monitor   Security  Boot   Exit

    Save Changes and Exit                          Exit system setup after saving
    Discard Changes and Exit                       the changes.
    Discard Changes
    Load UEFI Defaults                             F10 key can be used for this
                                                   operation.
    Launch EFI Shell from filesystem device



                                                   ↔: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Option
                                                   F1: General Help
                                                   F7: Discard Changes
                                                   F9: Load UEFI Defaults
                                                   F10: Save and Exit
                                                   ESC: Exit

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```

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 various Microsoft® Windows® operating systems: 10 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer 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.