

**MIX-H310A2**

**Industrial Motherboard**

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## Contents

<b>Chapter 1</b>	<b>Product overview</b>	
1.1	Package contents.....	1-1
1.2	Features .....	1-1
1.3	Specifications.....	1-2
<b>Chapter 2</b>	<b>Motherboard information</b>	
2.1	Before you proceed .....	2-1
2.2	Motherboard layout.....	2-2
2.3	Screw size.....	2-4
	2.3.1 Component side.....	2-4
	2.3.2 Solder side .....	2-5
2.4	Central Processing Unit (CPU) .....	2-6
	2.4.1 Installing the CPU .....	2-7
	2.4.2 CPU heatsink and fan assembly installation.....	2-9
2.5	System memory .....	2-11
2.6	Jumpers .....	2-12
2.7	Connectors .....	2-17
	2.7.1 Rear panel connectors.....	2-17
	2.7.2 Internal connectors .....	2-19
<b>Chapter 3</b>	<b>BIOS setup</b>	
3.1	BIOS setup.....	3-1
3.2	Main menu .....	3-2
	3.2.1 System Date [Day MM/DD/YYYY] .....	3-2
	3.2.2 System Time [HH:MM:SS] .....	3-2
3.3	Advanced menu .....	3-2
	3.3.1 CPU Configuration .....	3-2
	3.3.2 Trusted Computing .....	3-3
	3.3.3 SATA Configuration .....	3-4
	3.3.4 USB Configuration .....	3-4
	3.3.5 Hardware Monitor .....	3-5
	3.3.6 SIO Configuration .....	3-7
	3.3.7 PCH-FW Configuration .....	3-7
	3.3.8 Power Management.....	3-8
	3.3.9 Digital IO Port Configuration .....	3-8

<b>3.4</b>	<b>Chipset menu .....</b>	<b>3-9</b>
3.4.1	System Agent (SA) Configuration .....	3-9
3.4.2	PCH-IO Configuration .....	3-9
<b>3.5</b>	<b>Security menu .....</b>	<b>3-9</b>
3.5.1	Administrator Password .....	3-9
3.5.2	User Password.....	3-10
<b>3.6</b>	<b>Boot menu .....</b>	<b>3-11</b>
3.6.1	Boot Configuration .....	3-11
3.6.2	FIXED BOOT ORDER Priorities .....	3-11
<b>3.7</b>	<b>Save &amp; Exit menu .....</b>	<b>3-11</b>
 <b>Appendix</b>		
	<b>Notices.....</b>	<b>A-1</b>

# Chapter 1

## Product overview

### 1.1 Package contents

Check your industrial motherboard package for the following items.

- 1 x Industrial Motherboard
- 1 x SATA 6.0Gb/s cable
- 1 x I/O Shield



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If any of the above items is damaged or missing, contact your distributor or sales representative immediately.

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### 1.2 Features

- Intel® 8<sup>th</sup>/9<sup>th</sup> Generation (Coffee Lake S) Core™ i7/ i5/ i3, Pentium® LGA1151 socket Processor, max. 65W TDPs
- 2 x SO-DIMMs, max. 64GB, DDR4 2666/2400 MHz, non-ECC (vertical type), Dual channel memory
- 2 x SATA 6.0 Gb/s ports, 4 x USB 3.1 Gen 1 ports, 2 x USB 2.0 ports
- Realtek ALC887 High Definition Audio CODEC
- Multi Display: 1 x VGA, 1 x HDMI™, 1 x eDP, 1 X LVDS
- Dual Ethernet LAN: 1 x Intel® PCIe Gb LAN 219V, 1 x Intel® PCIe Gb LAN 211AT
- 1 x PCIe 3.0 [x16] slot
- 1 x M.2 slot (E-key), 22 x 30mm, 1 x M.2 slot (M-key), 2280 (SATA)

## 1.3 Specifications

SYSTEM	
<b>CPU</b>	Intel® 8 <sup>th</sup> /9 <sup>th</sup> Generation (Coffee Lake S) Core™ i7/ i5/ i3, Pentium® LGA1151 socket processor, max. 65W TDPs (6-core)
<b>Chipset</b>	Intel® H310 Express Chipset
<b>Memory</b>	2 x SO-DIMMs, max. 64GB, DDR4 2666/2400 MHz, non-ECC (Vertical Type) memory Dual channel memory architecture
<b>I/O Chipset</b>	NCT6793D
<b>Storage</b>	2 x SATA 6.0Gb/s ports 1 x M.2 slot(M-key), 22 x 80mm (SATA)
<b>Ethernet</b>	1 x Intel® i219V Gigabit LAN
<b>Audio</b>	Realtek® ALC887 with Amplifier
<b>TPM</b>	NPCT650ABBYX TPM2.0 (Optional)
<b>Expansion slots</b>	1 x PCIe 3.0 [x16] slot 1 x M.2 slot (M-key), 22 x 80mm (SATA mode) 1 x M.2 slot (E-key), 22 x 30mm
<b>BIOS</b>	256Mbit Flash ROM, AMI BIOS
<b>H/W Status Monitor</b>	Monitors CPU/ system temperature Monitors Vcore/ 5V/ 12V voltage Monitors CPU/ chassis fan speed
<b>Watchdog Timer</b>	1~255 steps by software program
<b>Smart Fan Control</b>	CPU Fan (3.3V/5V PWM control) / Chassis Fan
<b>Wake On LAN / PXE</b>	Yes ( WOL, PXE)
<b>Power States</b>	S3, S4, S5
Graphics	
<b>Graphics Multi Display</b>	1 x HDMI™ + 1 x VGA + 1 x DisplayPort + 1 x LVDS
<b>Resolution</b>	VGA: Up to 1920 x 1200 @ 60 Hz HDMI™: 3840 x 2160 @ 30 Hz (HDMI™ 1.4b) DisplayPort: 4096 x 2160 @ 24 Hz / 3840 x 2160 @ 60 Hz, with Digital Audio LVDS: Up to 1920 x 1200 @ 60 Hz, Dual Channel 18/24 bit (1 x inverter)
Environment, Power, and ME	
<b>Battery</b>	Lithium battery
<b>Power requirement</b>	ATX
<b>Operating temperature</b>	32°F~140°F (0°C~60°C)
<b>Operating humidity</b>	0%~90% relative humidity, non-condensing
<b>Certificate</b>	CE & FCC
<b>Form factor</b>	Mini ITX Form Factor: 6.7"x 6.7" (170mm x 170mm)
<b>Weight</b>	1.1 lb (0.5 Kg)

(continued on the next page)

<b>I/O</b>	
<b>Storage</b>	2 x SATA 6.0Gb/s ports 1 x M.2 slot (M-key), 2280 (SATA mode)
<b>USB</b>	4 x USB 3.2 Gen 1 ports (2 ports in Rear I/O) 2 x USB 2.0 ports (2 ports from 1 internal header)
<b>Display</b>	1 x VGA, 1 x HDMI™, 1 x DisplayPort, 1 x LVDS
<b>Serial port</b>	1 x RS-232 (mid board) 1 x RS-232/422/485 supports 5V/12V/RI option (Rear IO)
<b>LAN</b>	2 x LAN (RJ-45) ports
<b>Audio</b>	Mic-in, Line-out, 1 x internal speaker (will be disabled when a device is plugged into the Line-out jack in the rear IO)
<b>DIO</b>	8-bit Digital I/O interface (4-in/ 4-out)
<b>FAN</b>	1 x CPU fan header (4-pin) 1 x Chassis fan header (4-pin)
<b>Placement</b>	
<b>Back Panel I/O Ports</b>	1 x VGA port 1 x HDMI™ port 1 x DisplayPort 1 x COM (RS485/422/232) 2 x [1 x LAN (RJ45) + 2 x USB 3.2 Gen 1] 2 x Audio jacks for Mic-in & Line out
<b>Internal I/O Connectors</b>	1 x PCIe 3.0 [x16] slot 1 x M.2 slot (M-Key), 2280 (SATA mode) 1 x M.2 slot (E-Key), 2230 2 x SATA 6.0Gb/s ports 1 x USB 2.0 header supports additional 2 USB ports (2.00 mm) 1 x box header for COM (COM2: RS232) 1 x Digital I/O box header 1 x 4-pin (2x2) internal power connectors 1 x 4-pin CPU Fan header 1 x 4-pin Chassis Fan header 1 x Front Panel Audio header (AAFP) 1 x System Panel header 1 x Speaker for 2W/4Ω 1 x Chassis Intrusion follow ASUS pin out 1 x Buzzer on board 1 x AT/ATX mode selection jumper (Default: No) 1 x clear CMOS jumper
<b>Others</b>	
<b>OS support</b>	Windows® 10 64-bit Ubuntu 18.04.2 Kernel 4.18.0
<b>Accessories</b>	1 x SATA cable 1 x I/O shield



**NOTE:** Specifications are subject to change without notice.





# Chapter 2

## Motherboard information

### 2.1 Before you proceed

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



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**CAUTION!**

- Unplug the power cord from the wall socket before touching any component.
  - Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
  - Hold components by the edges to avoid touching the ICs on them.
  - Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
  - Before you install or remove any component, ensure that the ATX power supply 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, or components.
-

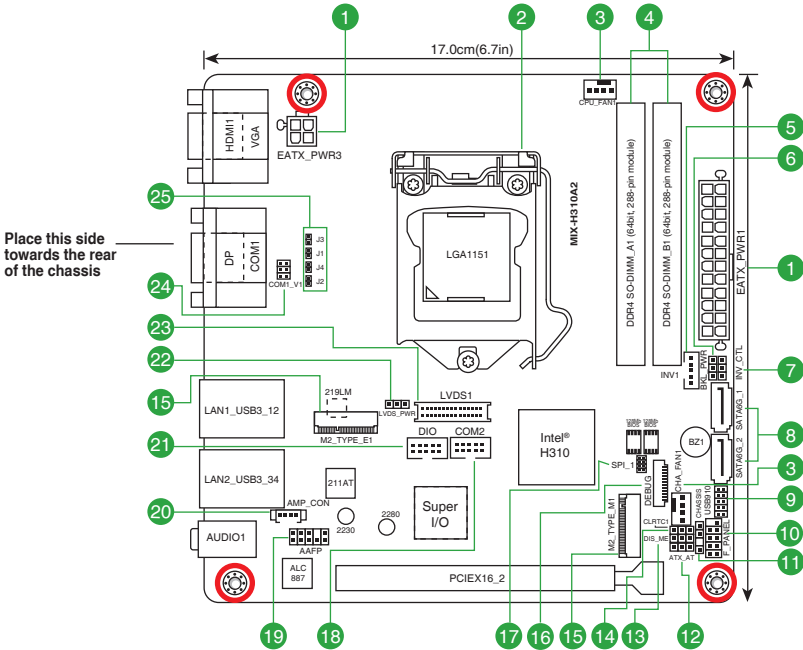
## 2.2 Motherboard layout



**NOTE:** Place four screws into the holes indicated by circles to secure the motherboard to the chassis.



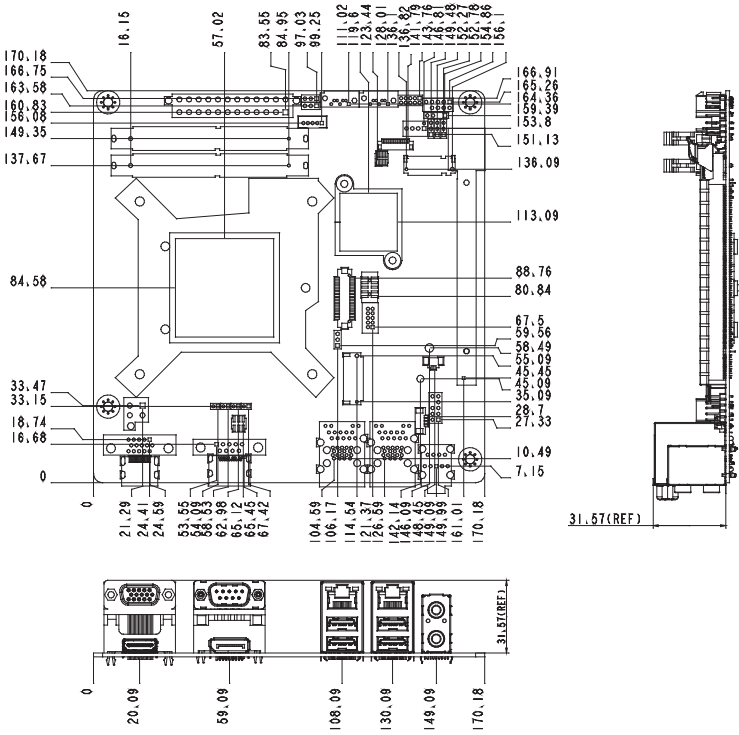
**CAUTION!** Do not overtighten the screws! Doing so can damage the motherboard.



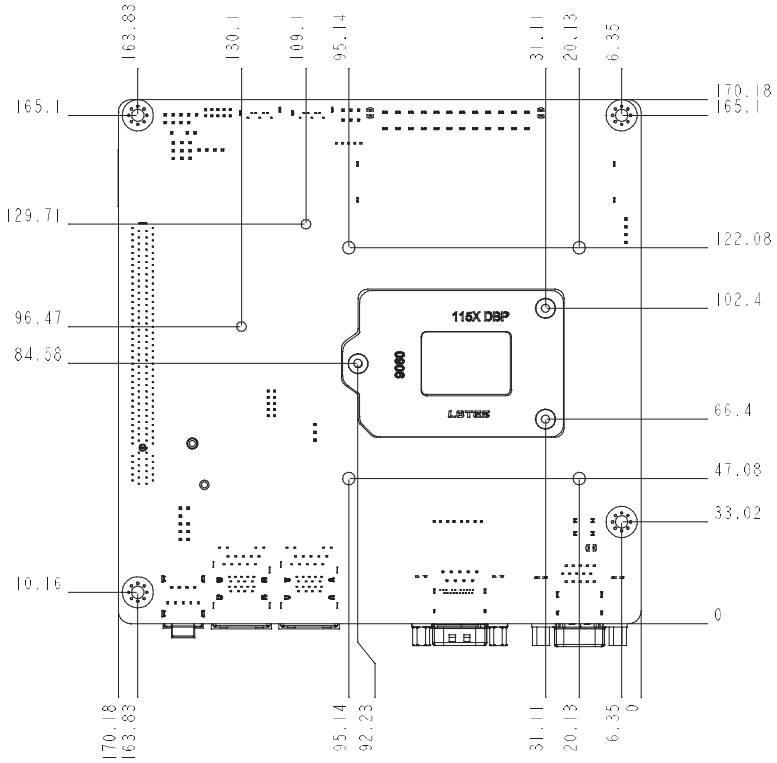
Connectors/Jumpers/Slots	Page
1. EATX power connectors (24-pin EATX_PWR1, 4-pin EATX_PWR3)	2-19
2. Intel® LGA1151 CPU socket	2-6
3. CPU and Chassis Fan headers (4-pin CPU_FAN1, 4-pin CHA_FAN1)	2-19
4. DDR4 SO-DIMM slots	2-11
5. Backlight inverter power header (5-pin INV1)	2-20
6. Backlight voltage selection jumper (3-pin BKL_PWR)	2-13
7. Inverter backlight control mode selection jumper (3-pin INV_CTL)	2-13
8. SATA 6.0Gb/s ports (7-pin SATA6G_1~2)	2-20
9. USB 2.0 headers (10-pin USB910)	2-21
10. System Panel header (10-1 pin F_PANEL)	2-21
11. Chassis intrusion jumper (4-1 pin CHASSIS)	2-14
12. AT/ATX mode selection jumper (3-pin ATX_AT)	2-14
13. Intel® ME jumper (3-pin DIS_ME)	2-15
14. Clear RTC RAM (3-pin CLRTC1)	2-12
15. M.2 M-Key and M.2 E-Key slots	2-22
16. Debug Card connector	2-22
17. BIOS programmable header (8-pin SPI_1)	2-23
18. Serial Port header (10-pin COM2)	2-23
19. Front Panel Audio header (10-1 pin AAFP)	2-24
20. Speaker out connector (4-pin AMP_CON)	2-24
21. Digital I/O header (10-pin DIO)	2-25
22. LVDS panel voltage selection jumper (3-pin LVDS_PWR)	2-15
23. LVDS connector (30-pin LVDS1)	2-25
24. COM1 Ring/+5V/+12V selection jumper (6-pin COM1_V1)	2-16
25. COM1 operating mode selection jumpers (2-pin J1/J2/J3/J4)	2-16

## 2.3 Screw size

### 2.3.1 Component side

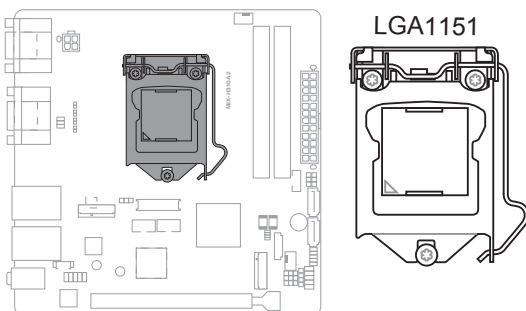


## 2.3.2 Solder side



## 2.4 Central Processing Unit (CPU)

This motherboard comes with an Intel® 8<sup>th</sup>/9<sup>th</sup> Generation (Coffee Lake S) Core™ i7 / i5 / i3, Pentium® LGA 1151 socket processor.



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**IMPORTANT:** Unplug all power cables before installing the CPU.

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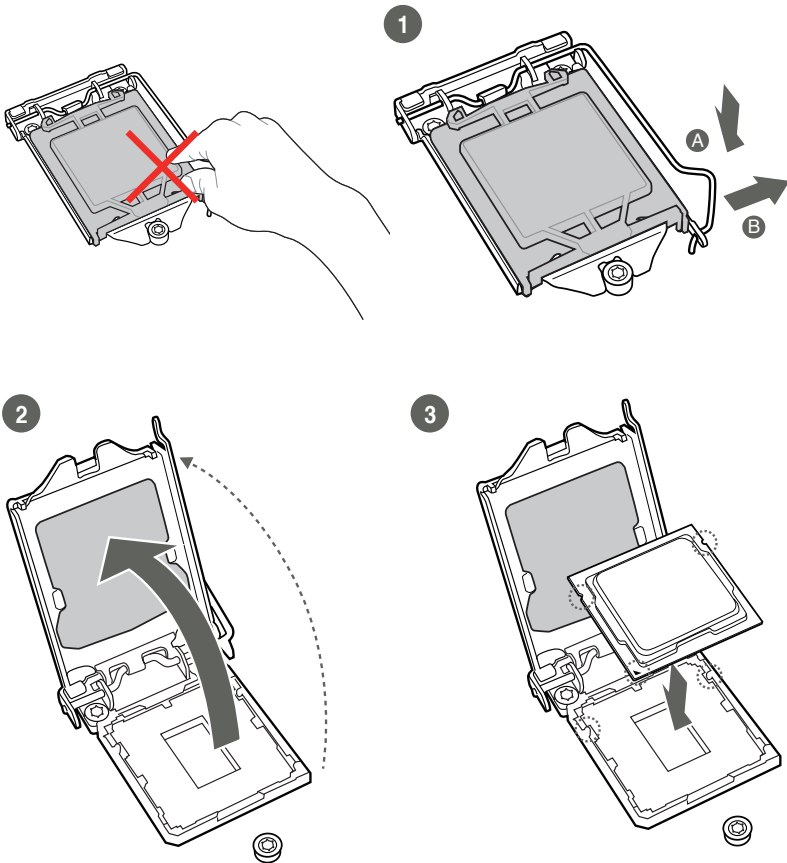
### **CAUTION!**

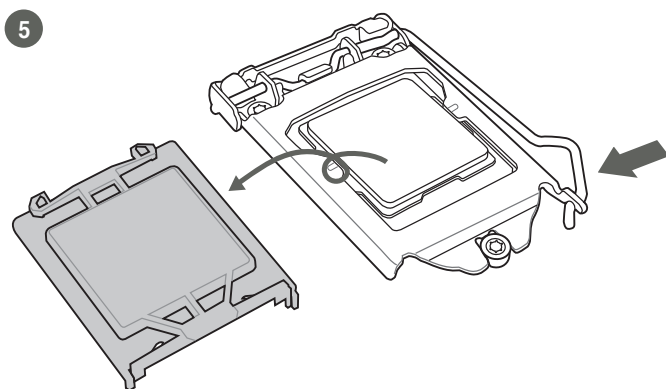
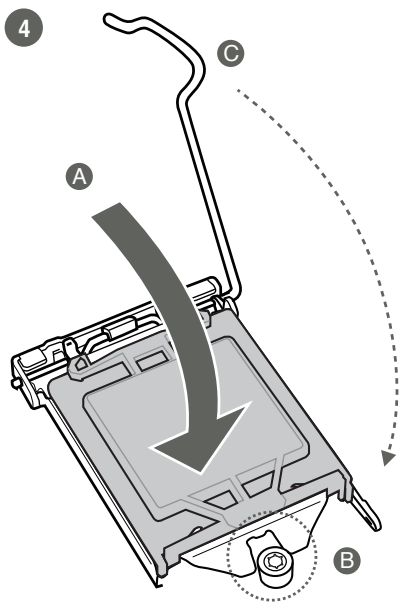
- Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components.
  - Keep the cap after installing the motherboard. The manufacturer will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1151 socket.
  - The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.
-

## 2.4.1 Installing the CPU



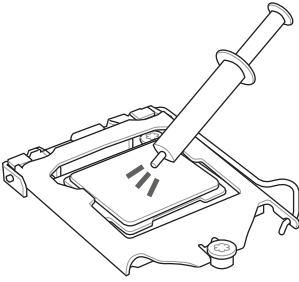
**CAUTION!** Ensure that you install the correct CPU designed for LGA1151 only. DO NOT install a CPU designed for LGA1155 and LGA1156 sockets on the LGA1151 socket.





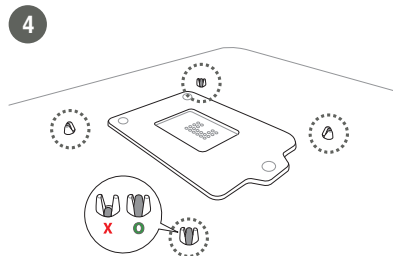
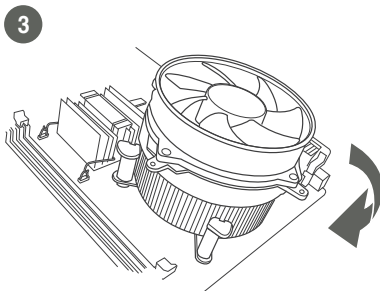
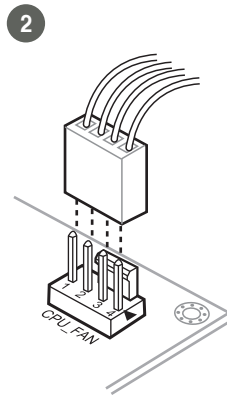
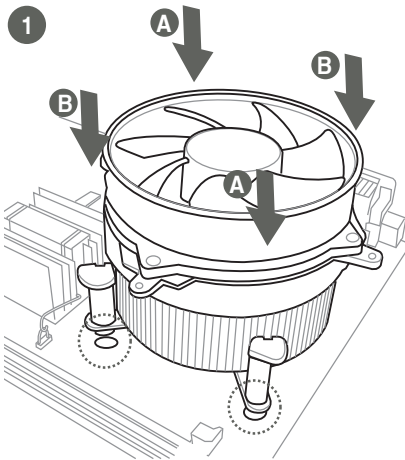


## 2.4.2 CPU heatsink and fan assembly installation

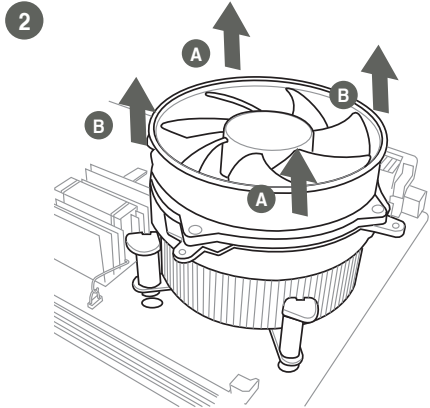
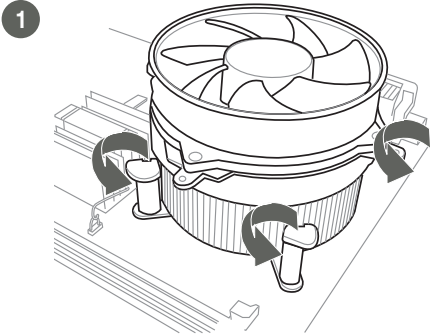


**CAUTION!** Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary.

To install the CPU heatsink and fan assembly

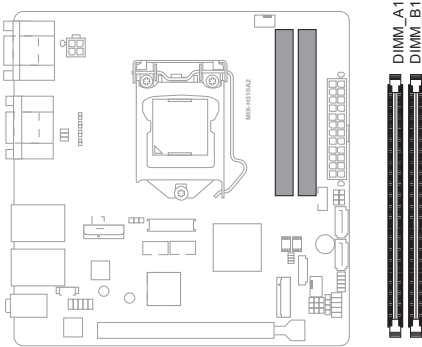


To uninstall the CPU heatsink and fan assembly



## 2.5 System memory

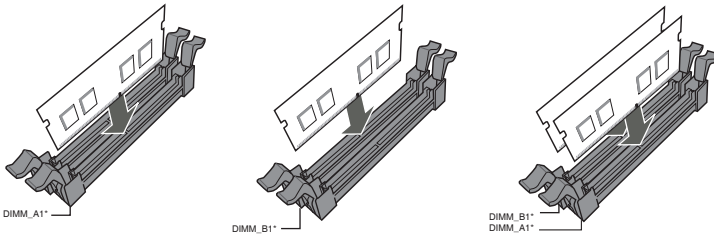
This motherboard comes with two Double Data Rate 4 (DDR4) Small Outline Dual Inline Memory Modules (SO-DIMM) sockets. The figure illustrates the location of the DDR4 DIMM sockets:



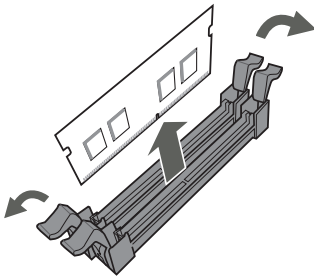
**NOTE:** Use the DIMM\_A1 slot when inserting only one SO-DIMM.

### Installing a DIMM

To install a DIMM



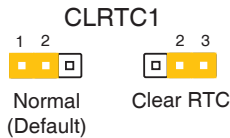
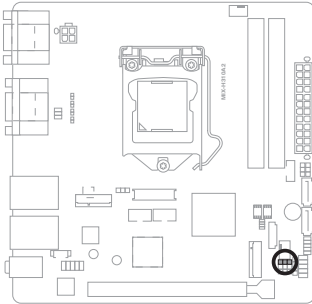
To remove a DIMM



## 2.6 Jumpers

### 1. Clear RTC RAM (3-pin CLRRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.



#### To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS setup to reenter data.



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**CAUTION!** Except when clearing the RTC RAM, never remove the cap on CLRRTC jumper default position. Removing the cap will cause system boot failure!

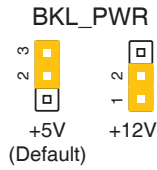
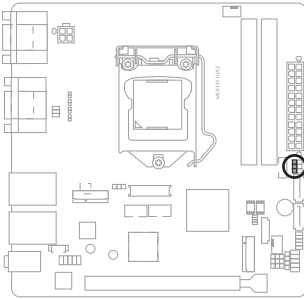
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#### NOTES:

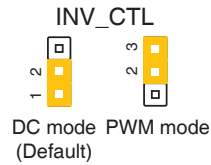
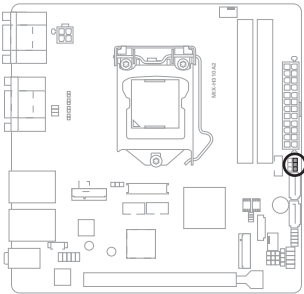
- If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.
  - You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the CPU Parameter Recall (C.P.R) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.
-

## 2. Backlight voltage selection jumper (3-pin BKL\_PWR)



	Pins
+5V (Default)	2-3
+12V	1-2

## 3. Inverter backlight control mode selection jumper (3-pin INV\_CTL)

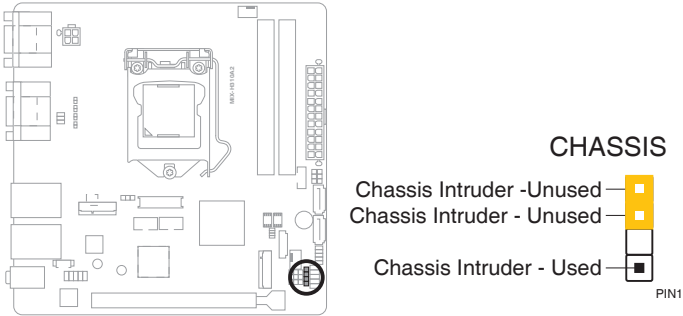


Setting	Pins
DC mode (Default)	1-2
PWM mode	2-3

#### 4. Chassis intrusion jumper (4-1 pin CHASSIS)

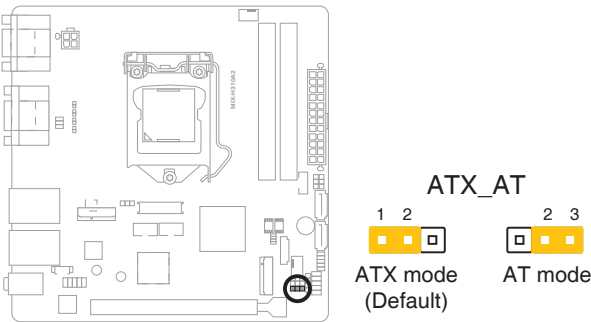
This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

Move the jumper cap to pins 1-2 when you intend to use the chassis intrusion detection feature.



Pins	
1-2	Enables the chassis intrusion detection feature
3-4	Disables the chassis intrusion detection feature (Default)

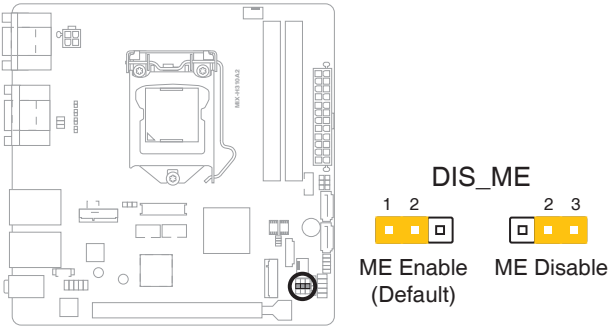
#### 5. AT/ATX mode selection (3-pin ATX\_AT)



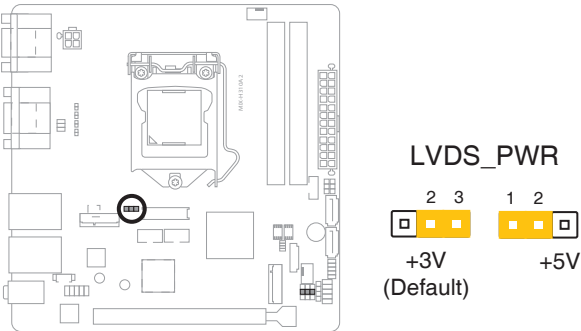
	Pins
ATX mode (Default)	1-2
AT mode	2-3

## 6. Intel® ME Jumper (3-pin DIS\_ME)

This jumper allows you to force the Intel® Management Engine (ME) to boot from recovery mode when ME becomes corrupted.

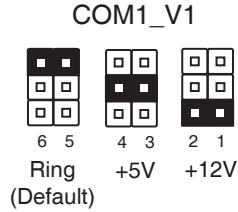
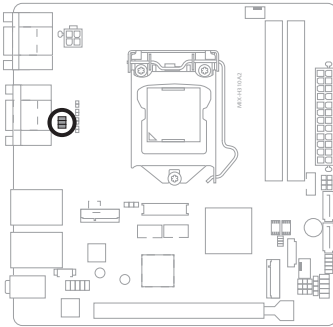


## 7. LVDS panel voltage selection jumper (3-pin LVDS\_PWR)



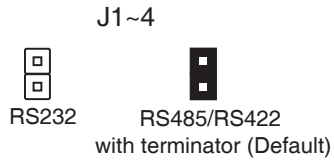
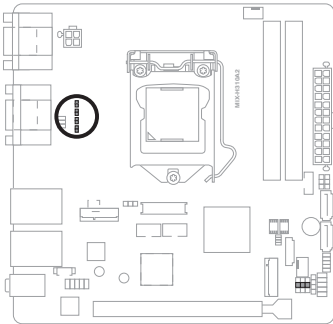
Setting	Pins
+3V (Default)	2-3
+5V	1-2

**8. COM1 Ring/+5V/+12V selection jumper (6-pin COM1\_V1)**



Setting	Pins
+12V	1-2
+5V	3-4
Ring (Default)	5-6

**9. COM1 operating mode selection jumpers (2-pin J1/J2/J3/J4)**

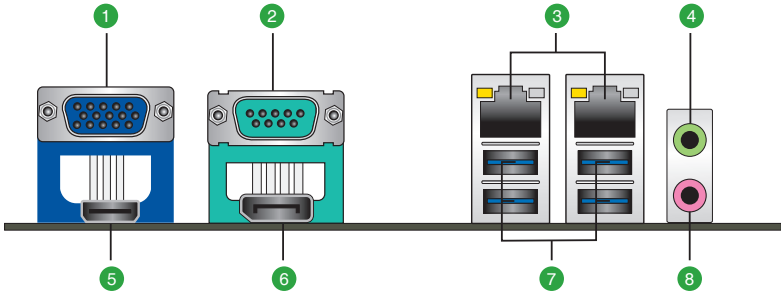


Setting	Pins
RS232	Open jumpers J1, J2, J3 and J4
RS485/RS422 with terminator	Short-circuit jumpers J1, J2, J3 and J4 (Default)

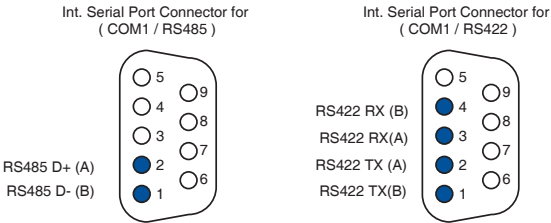


## 2.7 Connectors

### 2.7.1 Rear panel connectors



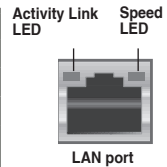
- 1. Video Graphics Adapter (VGA) port.** This 15-pin port is for a VGA monitor or other VGA-compatible devices.
- 2. Serial ports (COM1).** These ports connect a modem, or other devices that conform with serial specification.



- 3. LAN (RJ-45) ports.** These ports allow Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

#### LAN port LED indications

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
Off	No link	Off	10 Mbps connection
Orange	Linked	Orange	100 Mbps connection
Orange (Blinking)	Data activity	Green	1 Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode	—	—

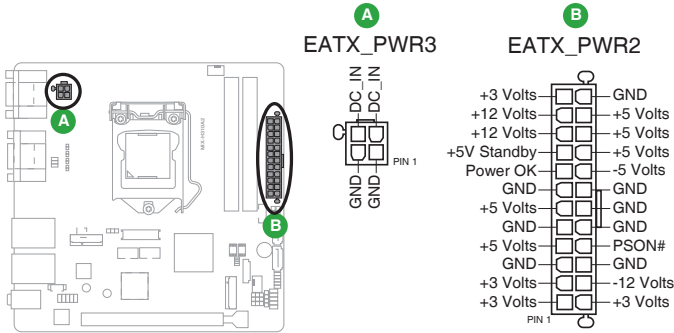


4. **Line Out port (lime).** This port connects to a headphone or a speaker.
5. **HDMI™ port.** This port is for a High-Definition Multimedia Interface (HDMI™) connector, and is HDCP compliant allowing playback of HD DVD, Blu-ray, and other protected content.
6. **DisplayPort.** This port connects to a DisplayPort-compatible device.
7. **USB 3.2 Gen 1 ports.** These 9-pin Universal Serial Bus (USB) ports connect to USB 3.2 Gen 1 devices.
8. **Microphone port (pink).** This port connects to a microphone.

## 2.7.2 Internal connectors

### 1. Internal power connectors (24-pin EATX\_PWR1, 4-pin EATX\_PWR3)

These connectors are for EATX power supply plugs. The power supply plugs are designed to fit these connector in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



#### IMPORTANT:

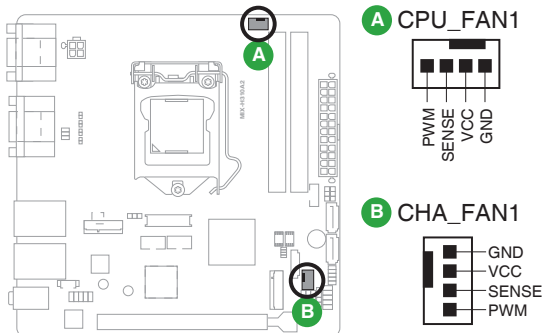
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12V Specification 2.0 (or later version).
- We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.



For safety purpose, use ONLY the bundled power adapter to avoid damaging your motherboard.

### 2. Chassis / CPU Fan headers (4-pin CHA\_FAN1, 4-pin CPU\_FAN1)

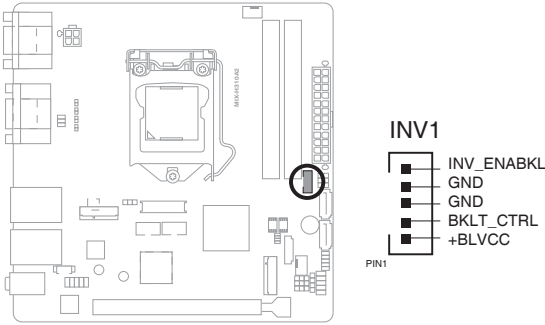
Connect the fan cables to the fan headers on the motherboard, ensuring that the black wire of each cable matches the ground pin of the header.



**CAUTION:** Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

### 3. Backlight inverter power header (5-pin INV1)

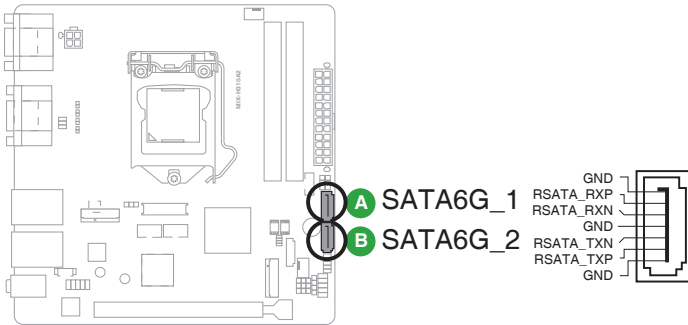
Connect a backlight inverter power cable to this header.



**IMPORTANT:** The backlight inverter power connector supports 1A current to the maximum.

### 4. SATA 6.0 Gb/s ports (7-pin SATA6G\_1~2)

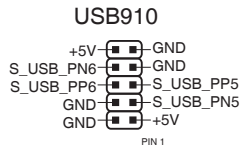
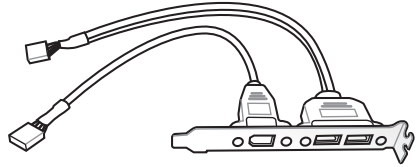
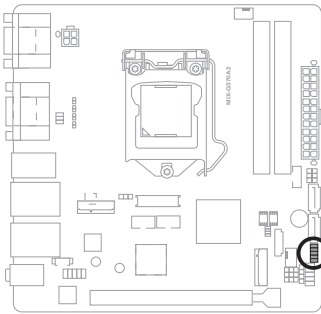
These ports connect to SATA 6.0 Gb/s hard disk drives via SATA 6.0 Gb/s signal cables.



**IMPORTANT:** When using hot-plug and NCQ, set the SATA Mode Selection item in the BIOS to [AHCI]. See section 3.3.3 **SATA Configuration** for details.

## 5. USB 2.0 headers (10-pin USB910)

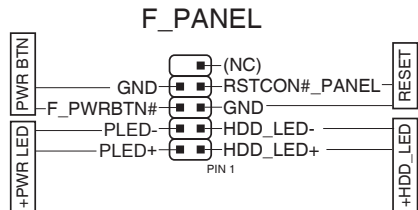
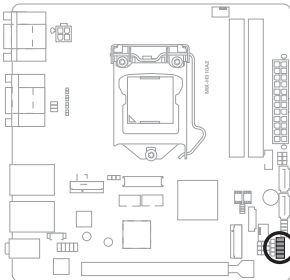
The USB 2.0 headers allow you to connect USB modules for additional USB 2.0 ports. The USB 2.0 headers provide data transfer speeds of up to 480 Mb/s.



Never connect a 1394 cable to the USB connector. Doing so will damage the motherboard.

## 6. System Panel header (10-1 pin F\_PANEL)

The System Panel header supports several chassis-mounted functions.



- **System power LED (2-pin +PWR\_LED)**

This 2-pin header is for the system power LED. Connect the chassis power LED cable to this header. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin +HDD\_LED)**

This 2-pin header is for the HDD Activity LED. Connect the HDD Activity LED cable to this header. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **ATX power button/soft-off button (2-pin PWR\_BTN)**

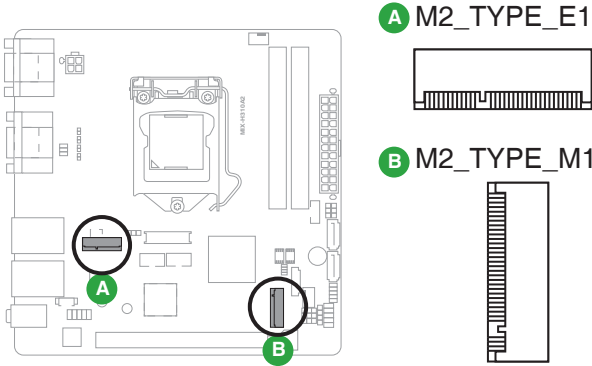
This 2-pin header is for the system power button.

- **Reset button (2-pin RESET)**

This 2-pin header is for the chassis-mounted reset button for system reboot without turning off the system power.

## 7. M.2 E-Key and M-Key slots

These slots allow you to install M.2 (NGFF) modules.

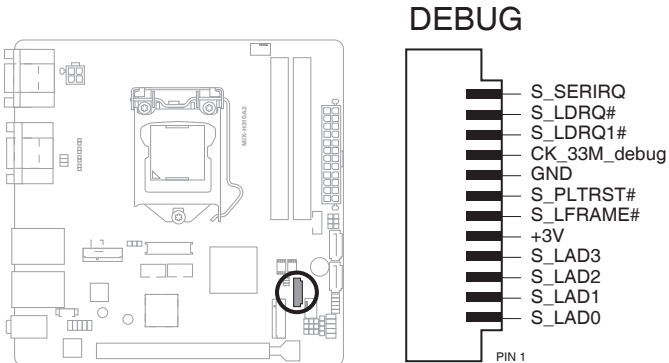


### NOTES:

- The M.2 SSD module is purchased separately.
- The M.2 E-key slot supports type 2230 PCIe/CNV1 module.
- The M.2 M-key slot supports type 2280 SATA storage devices.

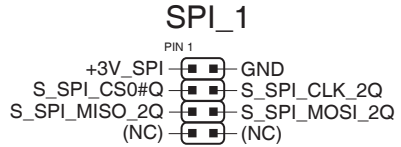
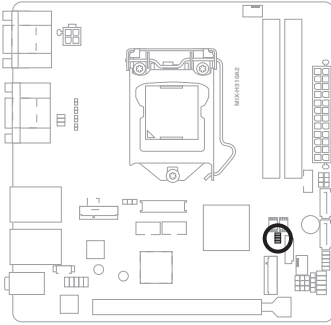
## 8. Debug Card connector

This connector allows connection to a Debug card.



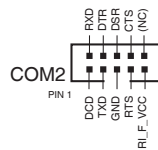
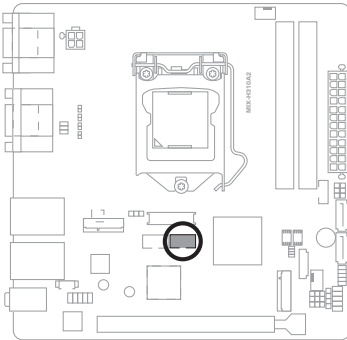
## 9. BIOS programmable header (8-pin SPI\_1)

Use this header to flash the BIOS ROM.



## 10. Serial Port header (10-pin COM2)

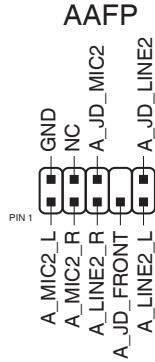
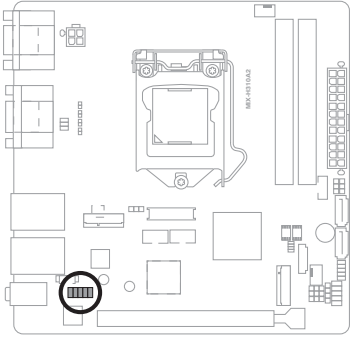
This header is for a serial (COM) port. Connect the serial port module cable to the header, then install the module to a slot opening at the back of the system chassis.



**NOTE:** The COM module is purchased separately.

### 11. Front Panel Audio header (10-1 pin AAFP)

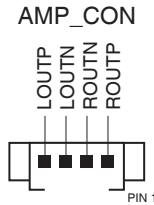
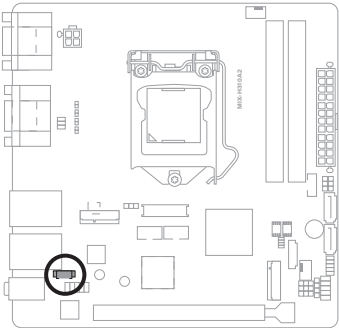
This header is for a chassis-mounted front panel audio I/O module that supports HD Audio audio standard. Connect one end of the front panel audio I/O module cable to this header.



**IMPORTANT:** We recommend that you connect a high-definition front panel audio module to this header to avail of the motherboard's high-definition audio capability.

### 12. Speaker out connector (4-pin AMP\_CON)

The 4-pin connector is for the chassis-mounted speaker.

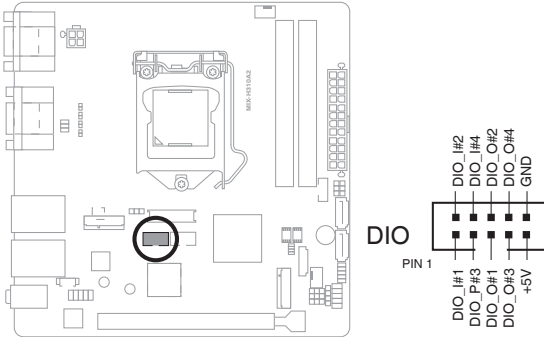


**NOTE:** The Speaker module is purchased separately.



### 13. Digital I/O header (10-pin DIO)

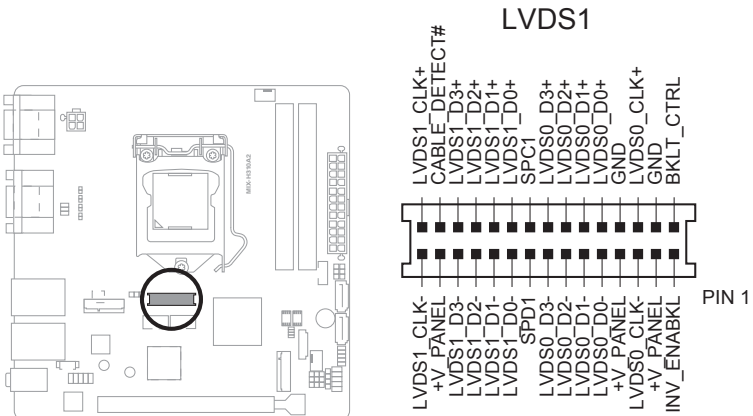
This header includes 8 I/O lines (In/Out programmable). All of the Digital I/O lines are programmable and each I/O pin can be individually programmed to support various devices.



**NOTE:** To configure the I/O pins in BIOS, go to the **Advanced** tab > **Digital IO Port Configuration**. See section 3.3.9 **Digital IO Port Configuration** for details.

### 14. LVDS connector (30-pin LVDS1)

This connector is for an internal LVDS connection.





# Chapter 3

## BIOS setup

### 3.1 BIOS setup

Use the BIOS Setup to configure settings. The BIOS screens include navigation keys and help to guide you in using the BIOS Setup program.

#### Entering BIOS Setup at startup

##### To enter BIOS Setup at startup:

Press <Delete> during the Power-On Self Test (POST). If you do not press <Delete>, POST continues with its routine.

#### Entering BIOS Setup after POST

##### To enter BIOS Setup after POST:

- Press <Ctrl>+<Alt>+<Del> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.



---

**NOTE:** Using the power button, reset button, or the <Ctrl>+<Alt>+<Del> keys to reboot a running operating system can cause damage to your data or system. Always shut down the system properly from the operating system.

---



##### **IMPORTANT:**

- The default BIOS settings for this motherboard apply to most working conditions and ensures optimal performance. If the system becomes unstable after changing any BIOS settings, load the default settings to regain system stability. Select the option **Restore Defaults** under the Save & Exit Menu. See section **3.7 Save & Exit Menu**.
  - The BIOS setup items described in this section are for reference purposes only, and may not exactly match what you see on your screen.
-

## Menu bar

The menu bar on top of the screen has the following main items:

<b>Main</b>	For changing the basic system configuration.
<b>Advanced</b>	For changing the advanced system settings.
<b>Chipset</b>	For viewing and changing chipset settings.
<b>Security</b>	For setting up BIOS security settings.
<b>Boot</b>	For changing the system boot configuration.
<b>Save &amp; Exit</b>	For selecting the exit options and loading default settings.

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

## 3.2 Main menu

The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

### 3.2.1 System Date [Day MM/DD/YYYY]

Allows you to set the system date.

### 3.2.2 System Time [HH:MM:SS]

Allows you to set the system time.

## 3.3 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.



---

Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

---

### Case Open Warning [Disabled]

Allows you to enable or disable case open warning function. Configuration options: [Disabled] [Enabled] [Clear]

### 3.3.1 CPU Configuration

The items in this menu show CPU-related information the BIOS automatically detects.



---

The items shown in the submenu may be different depending on the type of CPU installed.

---

### Hyper-threading [Enabled]

The Intel Hyper-Threading Technology allows a hyper-threading processor to appear as two logical processors to the operating system, allowing the operating system to schedule two threads or processes simultaneously.

[Enabled] Two threads per activated core are enabled.

[Disabled] Only one thread per activated core is enabled.



Configuration options for active processor cores are dependent on the installed CPU.

### Intel (VMX) Virtualization Technology [Enabled]

[Enabled] Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

[Disabled] Disables this function.

## 3.3.2 Trusted Computing

### Security Device Support [Enable]

Allows you to enable or disable BIOS support for security devices. Configuration options: [Disable] [Enable]

### SHA-1 PCR Bank [Enabled]

Allows you to enable or disable SHA-1 PCR Bank. Configuration options: [Disabled] [Enabled]

### SHA256 PCR Bank [Enabled]

Allows you to enable or disable SHA256 PCR Bank. Configuration options: [Disabled] [Enabled]

### Pending operation [None]

Allows you to schedule an operation for security devices. Reboot your system for the changes to take effect. Configuration options: [None] [TPM Clear]

### Platform Hierarchy [Enabled]

Allows you to enable or disable Platform Hierarchy. Configuration options: [Enabled] [Disabled]

### Storage Hierarchy [Enabled]

Allows you to enable or disable Storage Hierarchy. Configuration options: [Enabled] [Disabled]

### Endorsement Hierarchy [Enabled]

Allows you to enable or disable Endorsement Hierarchy. Configuration options: [Enabled] [Disabled]

### **TPM2.0 UEFI Spec Version [TCG\_2]**

Allows you to select the TCG2 spec version support.

[TCG\_1\_2]            Compatible mode for Windows® 8 / Windows® 10.

[TCG\_2]             Newer TCG2 protocol and event format for Windows® 10 or later.

### **Physical Presence Spec Version [1.3]**

Allows you to select which TCG Physical Presence Interface Specification Version is supported by the OS. Configuration options: [1.2] [1.3]

### **PH Randomization [Disabled]**

Allows you to enable or disable the Platform Hierarchy Randomization.

Configuration options: [Disabled] [Enabled]

### **Device Select [Auto]**

Allows you to schedule an operation for security devices. Reboot your system for the changes to take effect. Configuration options: [Auto] [TPM 1.2] [TPM 2.0]

[Auto]                Select this item to support both TPM 1.2 and TPM 2.0 devices with default support of TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

## **3.3.3     SATA Configuration**

### **SATA Controller(s) [Enabled]**

Allows you to enable or disable SATA devices. Configuration options: [Enabled] [Disabled]

### **SATA Mode Selection [AHCI]**

Allows you to set the working mode of the SATA controller. Configuration options: [AHCI] [RAID]

### **Port 0, Port 2 [Enabled]**

These items allow you to enable or disable the SATA port(s). Configuration options: [Disabled] [Enabled]

### **Hot Plug [Disabled]**

These items allow you to enable or disable SATA Hot Plug support. Configuration options: [Disabled] [Enabled]

## **3.3.4     USB Configuration**



---

The USB Devices item lists auto-detected values. If no USB device is detected, the item shows None.

---

## Legacy USB Support [Enabled]

- [Enabled] Enables the support for USB devices on legacy operating systems (OS).
- [Disabled] USB devices are only available when running BIOS Setup.
- [Auto] Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

## 3.3.5 Hardware Monitor

The items in this menu allow you to configure the smart fan.

### Smart Fan Configuration

#### CPU Smart Fan Control / CHA\_FAN1 Smart Fan Control [Enabled]

Allows you to enable or disable CPU\_FAN1/CHA\_FAN1 Smart Fan Control.  
Configuration options: [Enabled] [Disabled]



The following sub-items appear only when you set **CPU Smart Fan Control** or **CHA\_FAN1 Smart Fan Control** to [Enabled].

#### Fan Control Mode [Smart Fan IV Mode]

Configuration options: [Manual Mode] [Thermal Cruise Mode] [Smart Fan IV Mode]



The following items appear only when you set **Fan Control Mode** to [Smart Fan IV Mode].

#### Temperature 1 [40] / Temperature 2 [50] / Temperature 3 [60] / Temperature 4 [70]

Sets the temperature value for the Smart Fan IV mode.

#### Fan PWM 1 [150] / Fan PWM 2 [170] / Fan PWM 3 [200] / Fan PWM 4 [220]

Sets the Fan PWM value for the Smart Fan IV mode.

#### Tolerance of Temperature [0]

Input value range: [0~7]

#### Critical Temperature [75]

Input value range: [0~255]

#### Critical Temp Tolerance [0]

Input value range: [0~7]

#### Fan Count Step Up [1]

Input value range: [0~15]

**Fan Count Step Down [1]**

Input value range: [0~15]

**Fan Out Step Up Time [10]**

Sets the amount of time Fan Out takes to increase its value by one step.

Input value range: [0~255]

**Fan Out Step Down Time [10]**

Sets the amount of time Fan Out takes to decrease its value by one step in intervals of 0.1 seconds. Input value range: [0~255]



---

The following item appears only when you set **Fan Control Mode** to [Manual Mode].

---

**PWM/DC Voltage Output [255]**

Sets the voltage allocated for Fan Control. Input value range: [0~255]



---

The following items appear only when you set **Fan Control Mode** to [Thermal Cruise Mode].

---

**Target Temperature [50]**

Input value range: [0~127]

**Tolerance of Temperature [0]**

Input value range: [0~7]

**Fan Out Start-Up Value [127]**

Input value range: [0~255]

**Fan Stop Duty [Down to 0]**

Configuration options: [Down to 0] [To Fan Out Stop Value]

**Fan Out Stop Value [100]**

The Fan Out value decreases to this value if the temperature reaches below the lowest temperature limit. Input value range: [0~255]

**Fan Out Stop Time [60]**

Determines the amount of time it takes for the Fan Out value to fall from the stop value to zero. Input value range: [0~255]

**Critical Temperature [75]**

Determines the amount of time Fan Out takes to decrease its value by one step. Input value range: [0~255]

**Fan Out Step Up Time [10]**

Determines the amount of time Fan Out takes to increase its value by one step. Input value range: [0~255]



### Fan Out Step Down Time [10]

Determines the amount of time Fan Out takes to decrease its value by one step in intervals of 0.1 seconds. Input value range: [0~255]

## 3.3.6 SIO Configuration

The items in this menu allow you to configure Super IO settings.

### [\*Active\*] Serial Port 1

#### Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]



---

The following two items appear only when you set **Use this device** to [Enabled].

---

#### Possible [Use Automatic Settings]

Allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=3F8h; IRQ=4;] [IO=3E8h; IRQ=7]

#### Mode [RS232]

Allows you to select the Serial Port mode. Configuration options: [RS232] [RS422] [RS485]

### [\*Active\*] Serial Port 2

#### Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]



---

The following two items appear only when you set **Use this device** to [Enabled].

---

#### Possible [Use Automatic Settings]

Allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=3E8h; IRQ=7;] [IO=3F8h; IRQ=4]

## 3.3.7 PCH-FW Configuration

### Firmware Update Configuration

#### Me FW Image Re-Flash [Disabled]

This item allows you to enable or disable Me FW Image Re-Flash function. Configuration options: [Disabled] [Enabled]

#### Local FW Update [Disabled]

This item allows you to enable or disable Local FW FW Update function. Configuration options: [Disabled] [Enabled]

### 3.3.8 Power Management

#### Power Mode [ATX Type]

Shows the current power supply mode [ATX Type] or [AT Type] according to the position of ATX\_AT jumper.



---

The following items appear when you set Power Mode to [ATX Type].

---

#### Restore AC Power Loss [Last State]

[Last State] The system goes into either off or on state, whatever the system state was.

[Always On] The system goes into on state after an AC power loss.

[Always Off] The system goes into off state after an AC power loss.

#### RI Wake Event [Disabled]

Enable or disable system to wake up from RI#. Configuration options: [Enabled] [Disabled]

#### RTC Wake system from S5 [Disabled]

[Disabled] Disables system wake up from S5.

[Fixed Time] The system will wake up at the specified hr::min::sec. Configuration options: [Disabled] [Enabled] .

[Dynamic Time] The system will wake up at the current time plus a specified number of minutes.



---

The following items appear when Fixed Time is enabled.

---

#### Wake up day/hour/minute/second [0]

Specify the values for day/hour/minute/second.



---

The following item appears when Wake System with Dynamic Time is enabled.

---

#### Wake up minute increase [1]

Specify the number of minutes added to the current time before waking up system. Input value range: [1~5]

### 3.3.9 Digital IO Port Configuration

The items listed in this screen configure Digital IO settings.

#### DIO Port1~Port4 [Output], DIO Port5~Port8 [Input]

Configuration options: [Input] [Output]



---

The following item appears only when you set DIO Port1~8 to [Output].

---

#### Output Level [High]

Configuration options: [High] [Low]

## 3.4 Chipset menu

The Chipset menu items allow you to change configuration options for the North Bridge and South Bridge.

### 3.4.1 System Agent (SA) Configuration

#### Primary Display [Auto]

Allows you to decide which graphics controller to use as the primary boot device. Configuration options: [Auto] [IGFX] [PEG]

#### Primary IGFX Boot Display [VBIOS Default]

Select the video device which will be activated during POST. This setting has no effect if an external graphics device is present. The secondary boot display selection appears based on your selection and the VGA mode is supported only on primary display. Configuration options: [VBIOS Default] [HDMI] [LVDS] [DP] [VGA]

#### PCIEX16 Gen Speed [Auto]

Allows you to select the PCI Express port speed. Configuration options: [Auto] [Gen1] [Gen2] [Gen 3]

#### LVDS Panel Support [Auto]

Allows you to enable or disable LVDS Panel support. Configuration options: [Disabled] [Enabled]

### 3.4.2 PCH-IO Configuration

#### HD Audio [Enabled]

This item controls the detection of HD Audio devices. Configuration options: [Disabled] [Enabled]

## 3.5 Security menu

The Security menu items allow you to change the system security settings.

### 3.5.1 Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program.

#### To set an administrator password:

1. Select the Administrator Password item and press <Enter>.
2. From the Create New Password box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

### **To change an administrator password:**

1. Select the Administrator Password item and press <Enter>.
2. From the Enter Current Password box, key in the current password, then press <Enter>.
3. From the Create New Password box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the Administrator Password item on top of the screen shows Not Installed.

## **3.5.2 User Password**

If you have set a user password, you must enter the user password for accessing the system. The User Password item on top of the screen shows the default Not Installed. After you set a password, this item shows Installed.

### **To set a user password:**

1. Select the User Password item and press <Enter>.
2. From the Create New Password box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

### **To change a user password:**

1. Select the User Password item and press <Enter>.
2. From the Enter Current Password box, key in the current password, then press <Enter>.
3. From the Create New Password box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

To clear the user password, follow the same steps as in changing a user password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **User Password** item on top of the screen shows **Not Installed**.

## 3.6 Boot menu

The Boot menu items allow you to change the system boot options.

### 3.6.1 Boot Configuration

#### Quiet Boot [Enabled]

This item enables/disables Quiet Boot. Configuration options: [Disabled] [Enabled]

#### Launch PXE ROM [Do not launch]

This item controls the execution of UEFI and Legacy PXE OpROM. Configuration options: [Do not launch] [UEFI] [Legacy]

### 3.6.2 FIXED BOOT ORDER Priorities

#### Boot Option #1~#16

This item allows you to set the system boot order. Configuration options: [UEFI USB Key] [UEFI Hard Disk] [UEFI USB Hard Disk] [UEFI Network] [UEFI USB Lan] [UEFI CD/DVD] [UEFI USB CD/DVD] [UEFI USB Floppy] [USB Key] [Hard Disk] [USB Hard Disk] [Network] [USB Lan] [CD/DVD] [USB CD/DVD] [USB Floppy] [Disabled]

## 3.7 Save & Exit menu

### Save Changes and Reset

Once you are finished making your selections, choose this option from the Save & Exit menu to ensure the values you selected are saved. When you select this option, a confirmation window appears. Select Yes to save changes and reset.

### Discard Changes and Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select Yes to discard changes and exit.

### Restore Defaults

Save or restore User Defaults to all setup options.



# Appendix

## Notices

### Federal Communications Commission Statement

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

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

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

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



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**WARNING!** The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

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DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

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电子电气产品有害物质限制使用标识要求：图中之数字为产品之环保使用期限。仅指电子电气产品中含有的有害物质不致发生外泄或突变从而对环境造成污染或对人身、财产造成严重损害的期限。

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板及其电子组件	×	○	○	○	○	○
外壳	×	○	○	○	○	○
电源适配器	×	○	○	○	○	○
外部信号连接头及线材	×	○	○	○	○	○
中央处理器与内存	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求，然该部件仍符合欧盟指令 2011/65/EU 的规范。

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。