

**ATX Motherboard Supports 14nm LGA1151 8th/9th Generation Intel[®]
Core™ i9/i7/i5/i3, Celeron[®] and Pentium[®] Processor, DDR4,
Triple Independent Displays, Dual GbE LAN, USB 3.2 Gen 1,
SATA 6Gb/s, HD Audio and RoHS**

IMBA-H310

Quick Installation Guide **Version 1.0**

September 16, 2020

Package List

IMBA-H310 package includes the following items:

- 1 x IMBA-H310 single board computer
- 1 x I/O shielding
- 2 x SATA cable
- 1 x QIG



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Specifications

- CPU:
LGA1151 socket supports 8th/9th generation Intel® Core™ i9/i7/i5/i3, Celeron® and Pentium® processor
- System Chipset: Intel® H310
- Memory:
Two 288-pin 2666/2400 MHz dual-channel DDR4 SDRAM un-buffered DIMM slots (system max. 64 GB)
- BIOS: AMI UEFI BIOS
- Graphics Engine:
Intel® HD Graphics Gen 9 engine with 16 low-power execution units supports DX2015, OpenGL 5.X and OpenCL2.x, ES 2.0
- Display Output:
Triple independent display
1 x DVI-D (up to 2560x1600@60Hz)
1 x VGA (up to 1920x1200@60Hz)
1 x iDP (up to 4096x2304@60Hz)
- Super IO: Fintek 81866
- EC: IT8528E
- Ethernet:
LAN1: Intel® I219LM PHY
LAN2: Intel® I211AT PCIe Ethernet controller
- Audio:
Realtek ALC662 HD Audio codec supports 5.1-channel (line-in, line-out, mic-in)
- External I/O Interface:
4 x USB 3.2 Gen 1 (5Gb/s)
2 x USB 2.0
2 x RS-232
1 x PS/2 keyboard/mouse
- Internal I/O Interface:
1 x KB/MS (1x6 pin)
1 x LPT (2x13, p=2.54mm)

- 3 x RS-232 (2x5, p=2.54mm)
- 1 x RS-232/422/485 (2x5, p=2.54mm)
- 2 x USB 2.0 (2x4, p=2.54mm)
- 4 x SATA 6Gb/s (no RAID)
- Front Audio: 2x5-pin header
- Front Panel: 1 x Front panel (2x7 pin, power LED, HDD LED, speaker, power button, reset button)
- LAN LED: 2 x LAN LED (1x2 pin)
- SMBus: 1 x SMBus (1x4 pin)
- I²C: 1 x I²C (1x4 pin)
- Expansion:
 - 1 x PCIe x16 slot (Gen 3)
 - 1 x PCIe x4 slot (Gen 2)
 - 4 x PCI slots
- Digital I/O: 8-bit digital I/O (4-bit input / 4-bit output)
- TPM: 1 x 20-pin (2x10) header
- Watchdog Timer:
 - Software Programmable, supports 1~255 sec. System reset
- Fan Connector:
 - 1 x CPU smart fan (1x4 pin)
 - 2 x System smart fan (1x3 pin)
- Chassis intrusion: 1 x 2-pin header
- Power supply: ATX/AT power supply
- Power Consumption: 3.3V@0.39A, 5V@2.99A, 12V@3.08A, 5VSB@0.2A (Intel® Core™ i5-8500 up to 3.00 GHz CPU with 20 GB 2400/2133 MHz DDR4 memory)
- Operation Temperature: -20°C ~ 60°C
- Storage Temperature: -30°C~70°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Weight (GW/NW): 1200g/700g
- Dimensions: 244 mm x 305 mm

Ordering Information

- **IMBA-H310-R10:**
ATX motherboard supports 14nm LGA1151 8th/9th Generation Intel® Core™ i9/i7/i5/i3, Celeron® and Pentium® processor, DDR4, triple independent displays, dual GbE LAN, USB 3.2 Gen 1, SATA 6Gb/s, HD Audio and RoHS
- **IMBA-H310-ECO-R10:**
ATX motherboard supports 14nm LGA1151 8th/9th Generation Intel® Core™ i9/i7/i5/i3, Celeron® and Pentium® processor, DDR4, triple independent displays, dual GbE LAN, USB 3.2 Gen 1, SATA 6Gb/s, HD Audio, ECO packaging and RoHS
- **1980-000075-RS:** KB/MS cable with bracket, 220mm
- **32102-000100-200-RS:** SATA power cable
- **1980-003100-100-RS:** Dual-port USB cable with bracket, 300mm
- **32205-000702-100-RS:** RS-232 cable, 230mm
- **CF1156A-RS-R11:** High-performance LGA1155/1156 cooler kit, 1U chassis compatible 73W
- **CF-115XC-R10:** LGA1155/LGA1156 cooler kit, 1U chassis compatible, 45W
- **CF-115XD-R10:** LGA1155/LGA1156 cooler kit, 1U chassis compatible, 65W
- **CF-115XE-R10:** High-performance LGA1155/1156 cooler kit, 95W
- **TPM-IN02-R20:** 20-pin Infineon TPM 2.0 module, software management tool, firmware v5.5

All the drivers and utilities for the IMBA-H310 are available on IEI Resource Download Center. Type IMBA-H310 and press Enter to find all the relevant software, utilities, and documentation. To install software from the downloaded ISO file, mount the file as a virtual drive to view its content.

IEI Resource Download Center

<https://download.ieiworld.com>



Jumpers Settings and Connectors

LABEL	FUNCTION
CPU12V1	+12V power connector
ATXPWR1	Additional power connector
ATX1	ATX power connector
BAT1	Battery connector
CHASSIS1	Chassis intrusion connector
CHA_DIMM0, CHB_DIMM0	DDR4 DIMM sockets
DIO1	Digital I/O connector
CN1	EC debug connector
CPU_FAN1	Fan connector (CPU)
SYS_FAN1, SYS_FAN2	Fan connectors (system)
FRONT-PANEL1	Front panel audio connector
F_PANEL1	Front panel connector
I2C1	I ² C connector
DP1	Internal DisplayPort connector
KB_MS1	Keyboard and mouse connector
LED_LAN1, LED_LAN2	LAN LED connectors
LPT1	Parallel port connector
PCI1, PCI2, PCI3, PCI4	PCI slots
PCIEX16	PCIe x16 slot
PCIEX4_1	PCIe x4 slot
PWR_SW1	Power button
COM3, COM4, COM6	RS-232 serial ports
COM5	RS-232/422/485 serial port
S_ATA1, S_ATA2, S_ATA3, S_ATA4	SATA 6Gb/s drive connector
SMB1	SMBus connector
J_SPI1	SPI flash connector
J_EC1	SPI flash connector, EC
TPM1	TPM connector
USB1	USB 2.0 connector
AUDIO_CV1	External audio connector
LAN1_USB1,	External Ethernet and USB 3.2 Gen 1

LAN2_USB2	connectors
K/M_USB1	External keyboard/mouse and USB 2.0 connectors
COM1/1	External serial port connector
VIDEO1	External VGA and DVI-D connector

J_ATX_AT1: AT/ATX Mode Select Switch	
PIN NO.	DESCRIPTION
Short 1 - 2	ATX Mode (default)
Short 2 - 3	AT Mode

J_CMOS1: Clear CMOS Jumper	
PIN NO.	DESCRIPTION
Short (default)	Keep CMOS Setup (Normal Operation)
Open	Clear CMOS Setup

USB SW1, USB SW2: USB Power Setting	
BIOS Settings	DESCRIPTION
+5V	Power is not provided to the USB connectors when the system is in S3/S4 sleep state
+5VDUAL (default)	Power is provided to the USB connectors when the system is in S3/S4 sleep state

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.

Chipset

PCH-IO Configuration	
Auto Power Button Function (ATX)]	[Disable -----]
Restore AC Power Loss	[Last State]
Power Saving Function(ERP)	[Disabled]
USB Power SW1	[+5VDUAL]
USB Power SW2	[+5VDUAL]
<ul style="list-style-type: none"> > PCI Express Configuration > SATA Configuration > HD Audio Configuration 	

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J_FLASH1: Flash Descriptor Security Override	
PIN NO.	DESCRIPTION
Short 1 - 2	Disabled (default)
Short 2 - 3	Enabled

CPU12V1: +12V Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

ATXPWR1: Additional Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+12V	2	GND
3	GND	4	+5V

ATX1: 24-pin ATX Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

CHASSIS1: Chassis Intrusion Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3VSB	2	CHASSIS OPEN

DIO1 : Digital Input / Output Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

CN1: EC Debug Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_EPP_STB#	2	EC_EPP_AFD#
3	EC_EPP_PD0	4	NC
5	EC_EPP_PD1	6	EC_EPP_INIT#
7	EC_EPP_PD2	8	EC_EPP_SLIN#
9	EC_EPP_PD3	10	GND
11	EC_EPP_PD4	12	NC
13	EC_EPP_PD5	14	EC_EPP_BUSY
15	EC_EPP_PD6	16	EC_EPP_KSI5
17	EC_EPP_PD7	18	EC_EPP_KSI4

CPU_FAN1: CPU Fan Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM

SYS_FAN1, SYS_FAN2: System Fan Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FANIO	2	+12V (PWM)
3	GND		

FRONT-PANEL1 : Front Panel Audio Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC2-L	2	GND
3	MIC2-R	4	Presence#
5	LINE2-R	6	MIC2-JD
7	FRONT-IO	8	NC
9	LINE2-L	10	LINE2-JD

F_PANEL1: Front Panel Connector					
	PIN	DESCRIPTION	PIN	DESCRIPTION	
PWR LED	1	PWR_LED+	2	Speaker+	SPKR
	3	NC	4	N/C	
	5	PWR_LED-	6	N/C	
PWR BTN	7	PWR_BTN+	8	Speaker-	RESET
	9	PWR_BTN-	10	NC	
HDD LED	11	HDD_LED+	12	Reset+	
	13	HDD_LED-	14	Reset-	

I2C1: I²C Connector (to EC)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	I2C_DAT
3	I2C_CLK	4	+5V

KB_MS1: Keyboard/Mouse Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	Mouse Data
3	Mouse Clock	4	Keyboard Data
5	Keyboard Clock	6	GND

LED_LAN1: LAN LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN1_LED_LNK#_ACT

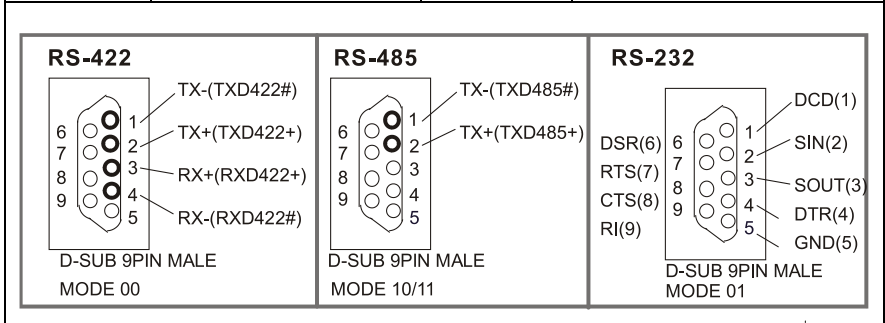
LED_LAN2: LAN LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

DP1: Internal DisplayPort Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA_0P	11	GND
2	GND	12	DATA_3N
3	DATA_0N	13	CONFIG1
4	DATA_1P	14	CONFIG2
5	GND	15	AUX_P
6	DATA_1N	16	GND
7	DATA_2P	17	AUX_N
8	GND	18	DP_HPD
9	DATA_2N	19	GND
10	DATA_3P	20	DP_PWR

LPT1: Parallel Port Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RSTROBE#	2	SIO_AFD#
3	RPD0	4	SIO_ERR#
5	RPD1	6	SIO_INIT#
7	RPD2	8	SIO_SLIN#
9	RPD3	10	GND
11	RPD4	12	GND
13	RPD5	14	GND
15	RPD6	16	GND
17	RPD7	18	GND
19	SIO_ACK#	20	GND
21	SIO_BUSY	22	GND
23	SIO_PE	24	GND
25	SIO_SLCT	26	N/C

COM3, COM4, COM6: Internal RS-232 Serial Port Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

COM5: Internal RS-232/422/485 Serial Port Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND



S_ATA1, S_ATA2, S_ATA3, S_ATA4: SATA 6Gb/s Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA_RX+
3	SATA_TX-	7	GND
4	GND		

SMB1: SMBus Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMB_DATA
3	SMB_CLK	4	+5V

J_SPI1: SPI Flash Connector (BIOS)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	4	SPI_CLK
2	SPI_CS#	5	SPI_SI
3	SPI_SO	6	GND

J_EC1: SPI Flash Connector (EC)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V_EC	4	SPI_CLK_EC
2	SPI_CS#_EC	5	SPI_SI_EC
3	SPI_SO_EC	6	GND

USB1: Internal USB 2.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

TPM1: Trusted Platform Module Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND
3	LFRAME#	4	KEY
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

AUDIO_CV1 : Audio Line-In/Out Mic Connector	
PIN NO.	DESCRIPTION
Line_In (Blue)	CD/DVD or other audio source input port
Line_Out (Green)	Connect this port to headphone or speaker
Microphone (Pink)	Connect this port to microphone

LAN1_USB1, LAN2_USB2: Ethernet and USB 3.2 Gen 1 Connectors			
USB1, USB2: External USB 3.2 Gen 1 Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+
LAN1, LAN2: RJ-45 LAN Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN_MDI0P	24	LAN_MDI2P
21	LAN_MDI0N	25	LAN_MDI2N
22	LAN_MDI1P	26	LAN_MDI3P
23	LAN_MDI1N	27	LAN_MDI3N

COM1/1: External RS-232 Serial Port Connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

VIDEO1: VGA Connector and DVI-D Connector			
VGA Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
V1	RED	V2	GREEN
V3	BLUE	V4	NC
V5	GND	V6	GND
V7	GND	V8	GND
V9	VCC	V10	GND
V11	NC	V12	DDCDA
V13	HSYNC	V14	VSYNC
V15	DDCCLK		
DVI-D Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA2-	13	NC
2	DATA2+	14	VCC +5V
3	SHIELD24	15	GND
4	NC	16	HPD
5	NC	17	DATA0-
6	DDCCLK	18	DATA0+
7	DDCDATA	19	SHIELD05
8	NC	20	NC
9	DATA-	21	NC
10	DATA1+	22	SHIELDCLK
11	SHIELD13	23	CLK2+
12	NC	24	CLK2-
C1	NC	C4	NC
C2	NC	C5	AGND
C3	NC	C6	NC

K /M_ USB1: PS/2 Keyboard & Mouse and USB 2.0 Port Connectors			
USB1: External USB 2.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	USB_DATA-	6	USB_DATA-
3	USB_DATA+	7	USB_DATA+
4	GND	8	GND
KB_MS1: PS/2 Keyboard and Mouse Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	GND	10	KEYBOARD DATA
11	MOUSE DATA	12	VCC
13	KEYBOARD CLOCK	14	MOUSE CLOCK

Board Layout: Jumper and Connector Locations (Unit: mm)

