IMBA-ARL-Q870

ATX Industrial Motherboard

Quick Installation Guide

Version 1.00   September, 2025

Features

- LGA1851 high-Performance Intel® Core™ Ultra Processors (Series 2)
- Dual-channel DDR5 288-pin 5600MHz, up to 192GB (ECC & Non-ECC support)
- Support DisplayPort, HDMI and USB4
- Support two M.2 M key for storage
- Support two PCIe x16, four PCIe x4 and one PCIe x1 expansions

Packing List

- 1 x IMBA-ARL-Q870 single board computer
- 1 x I/O Shielding
- 2 x SATA cable
- 1 x QIG (Quick Installation Guide)

Jumpers & Connectors

J_CMOS1: Clear CMOS jumper	
STATUS	DESCRIPTION
NC	Keep CMOS setup (normal operation)
Press Button	Clear CMOS setup

J_ATX_AT1: AT/ATX Power Mode Setting	
PIN NO.	DESCRIPTION
1-2 (Right)	ATX Power Mode (default)
2-3 (Left)	AT Power Mode

F_PANEL1: External Switches and Indicators panel			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	PC_BEEP_P
3	NC	4	NC
5	GND	6	NC-
7	PWR_BTN_N	8	PC_BEEP_N
9	GND	10	NC
11	HD_LED_P	12	PM_SYSRST_N
13	HD_LED_N	14	GND

USB2_CN1/2: Internal USB Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	USB_DN	4	USB_DP
5	USB_DP	6	USB_DN-
7	GND	8	VCC

DIO1: Digital Input / Output Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	DOUT5	4	DOUT4
5	DOUT3	6	DOUT2
7	DOUT1	8	DOUT0
9	DIN5	10	DIN4
11	DIN3	12	DIN2
13	DIN1	14	DIN0

SATA1-2/3-4: Serial ATA 3.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	8	GND
2	SATA_TXP_A	9	SATA_TXP_B
3	SATA_TXN_A	10	SATA_TXN_B
4	GND	11	GND
5	SATA_RXN_A	12	SATA_RXN_B

6	SATA_RXP_A	13	SATA_RXP_B
7	GND	14	GND

SYS_FAN1-2: System Fan Connector	
PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FANIN
4	PWM(+5V)

CPU_FAN1: CPU Fan Connector	
PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FANIN
4	PWM(+5V)

CPU12V1: +12V Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	GND	4	+12V
5	GND	6	+12V
7	GND	8	+12V

J_SMB1: SMBus Connector	
PIN NO.	DESCRIPTION
1	GND
2	SMB_DATA_MAIN
3	SMB_CLK_MAIN
4	+5V

J_I2C1: I2C Connector	
PIN NO.	DESCRIPTION
1	GND
2	SMDAT0_EC
3	SMCLK0_EC
4	+5V

CHASSIS1: Chassis Status Connector	
PIN NO.	DESCRIPTION
1	CASEOPEN_N
2	GND

M2_M2: M.2 M-key Socket Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	GND	4	+3.3V
5	N/C	6	N/C
7	N/C	8	N/C
9	GND	10	NGFF2_ACT_N
11	N/C	12	+3.3V
13	N/C	14	+3.3V
15	GND	16	+3.3V
17	N/C	18	+3.3V
19	N/C	20	N/C
21	GND	22	N/C
23	N/C	24	N/C
25	N/C	26	N/C
27	GND	28	N/C
29	PCIE_24_RX_DN	30	N/C
31	PCIE_24_RX_DP	32	N/C
33	GND	34	N/C
35	PCIE_24_TX_DN	36	N/C
37	PCIE_24_TX_DP	38	M_2_SATA_SLP
39	GND	40	N/C
41	PCIE_23_RX_DN	42	N/C
43	PCIE_23_RX_DP	44	N/C
45	GND	46	N/C
47	PCIE_23_TX_DN	48	N/C
49	PCIE_23_TX_DP	50	PERST_N
51	GND	52	SRCCLKREQB_15_N
53	CLK_SRC4_DN	54	NC
55	CLK_SRC4_DP	56	N/C
57	GND	58	N/C
59	N/C	60	N/C
61	N/C	62	N/C
63	N/C	64	N/C
65	N/C	66	N/C
67	N/C	68	NC
69	N/C	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		
N1	N/C	G1	GND
N2	N/C	G2	GND

M2_M1: M.2 M-key Socket Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	GND	4	+3.3V
5	N/C	6	N/C
7	N/C	8	N/C
9	GND	10	NGFF1_ACT_N
11	N/C	12	+3.3V
13	N/C	14	+3.3V
15	GND	16	+3.3V
17	N/C	18	+3.3V
19	N/C	20	N/C
21	GND	22	N/C
23	N/C	24	N/C
25	N/C	26	N/C
27	GND	28	N/C
29	PCIE_22_RX_DN	30	N/C
31	PCIE_22_RX_DP	32	N/C
33	GND	34	N/C
35	PCIE_22_TX_DN	36	N/C
37	PCIE_22_TX_DP	38	M_2_SSD_SLP
39	GND	40	N/C
41	PCIE_21_RX_DN	42	N/C
43	PCIE_21_RX_DP	44	N/C
45	GND	46	N/C
47	PCIE_21TX_DN1	48	N/C
49	PCIE_21TX_DP1	50	PLT_RST_N
51	GND	52	SRCCLKREQB_17_N
53	CLK_SRC3_DN	54	NC
55	CLK_SRC3_DP	56	N/C
57	GND	58	N/C
59	N/C	60	N/C
61	N/C	62	N/C
63	N/C	64	N/C
65	N/C	66	N/C
67	N/C	68	NC
69	PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		
N1	NC		
N2	NC		

COM1/COM2: COM Port Connector

PIN NO.	RS-232	RS-422	RS-485
1	DCD	TXD422-	TXD485-
2	RXD	TXD422+	TXD485+
3	TXD	RXD422+	--
4	DTR	RXD422-	--
5	GND	--	--
6	DSR	--	--
7	RTS	--	--
8	CTS	--	--
9	RI	--	--

COM3~6: Internal Serial Port Connectors

PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	DATA SET READY (DSR)
3	RECEIVE DATA (RXD)
4	REQUEST TO SEND (RTS)
5	TRANSMIT DATA (TXD)
6	CLEAR TO SEND (CTS)
7	DATA TERMINAL READY (DTR)
8	RING INDICATOR (RI)
9	GND
10	GND

ATX1: 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	PWRGD_PS	20	NC
9	+5V	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

HDMI1_DP2A/DP1: External Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LANE0P	11	GND
2	GND	12	LANE3N
3	LANE0N	13	AUX_CTRL_DET_C
4	LANE1P	14	GND
5	GND	15	AUXP
6	LANE1N	16	GND
7	LANE2P	17	AUXN
8	GND	18	HPD
9	LANE2N	19	GND
10	LANE3P	20	+5V

HDMI_DP1B: HDMI Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
21	HDMI_DATA2	33	N/C
22	GND	34	N/C
23	HDMI_DATA2#	35	HDMI_SCL
24	HDMI_DATA1	36	HDMI_SDA
25	GND	37	GND
26	HDMI_DATA1#	38	+5V
27	HDMI_DATA0	39	HDMI_HPD
28	GND		
29	HDMI_DATA0#		
30	HDMI_CLK		
31	GND		
32	HDMI_CLK#		

LAN1_USB1: LAN1_USB1 Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	21	MDI0_N_1
2	USB2_1_N	22	MDI1_P_1
3	USB2_1_P	23	MDI1_N_1
4	GND	24	MDI2_P_1
5	USB3_RX1_N	25	MDI2_N_1
6	USB3_RX1_P	26	MDI3_P_1
7	GND	27	MDI3_N_1
8	USB3_TX1_N	28	GND
9	USB3_TX1_P	29	+3.3V
10	+5V	30	LINK_ACT_N_1
11	USB2_2_N	31	SPEED_2500_N_1
12	USB2_2_P	32	SPEED_1000_N_1
13	GND	G1	GND
14	USB3_RX2_N	G2	GND

15	USB3_RX2_P	G3	LAN1_GND
16	GND	G4	LAN1_GND
17	USB3_TX2_N	G5	LAN1_GND
18	USB3_TX2_P	G6	LAN1_GND
19	GND	G7	LAN1_GND
20	MDI0_P_1	G8	LAN1_GND

LAN2_USB2: LAN2_USB2 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	21	MDI0_N_2
2	USB2_3_N	22	MDI1_P_2
3	USB2_3_P	23	MDI1_N_2
4	GND	24	MDI2_P_2
5	USB3_RX3_N	25	MDI2_N_2
6	USB3_RX3_P	26	MDI3_P_2
7	GND	27	MDI3_N_2
8	USB3_TX3_N	28	GND
9	USB3_TX3_P	29	+3.3V
10	+5V	30	LINK_ACT_N_2
11	USB2_4_N	31	SPEED_2500_N_2
12	USB2_4_P	32	SPEED_1000_N_2
13	GND	G1	LAN2_GND
14	USB3_RX4_N	G2	LAN2_GND
15	USB3_RX4_P	G3	LAN2_GND
16	GND	G4	LAN2_GND
17	USB3_TX4_N	G5	LAN2_GND
18	USB3_TX4_P	G6	LAN2_GND
19	GND	G7	LAN2_GND
20	MDI0_P_2	G8	LAN2_GND

USB3_1: USB 3.2 GEN2 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	13	GND
2	USB_D7N	14	USB3_RX8_N
3	USB_D7P	15	USB3_RX8_P
4	GND	16	GND
5	USB3_RX7_N	17	USB3_TX8_N
6	USB3_RX7_P	18	USB3_TX8_P
7	GND	G1	GND
8	USB3_TX7_N	G2	GND
9	USB3_TX7_P	G3	GND
10	+5V	G4	GND
11	USB_D8N		
12	USB_D8P		

USB3_2: USB 3.2 GEN2 Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	11	USB_D6P
2	USB3_RX5_N	12	USB_D6N
3	USB3_RX5_P	13	GND
4	GND	14	USB3_TX6_P
5	USB3_TX5_N	15	USB3_TX6_N
6	USB3_TX5_P	16	GND
7	GND	17	USB3_RX68_P
8	USB_D58N	18	USB3_RX6_N
9	USB_D5P	19	+5V
10	NC	20	

USB3_3: USB 3.2 GEN2 Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	7	GND
2	USB_D9N	8	USB3_TX9_N
3	USB_D9P	9	USB3_TX9_P
4	GND	G1-4	GND
5	USB3_RX9_N		GND
6	USB3_RX9_P		GND

JLAN_LED1/2

PIN NO.	DESCRIPTION
1	+3.3V
2	I226_LINK_ACT_N

Get more information:

IMBA-ARL-Q870

IEI Resource Download Center

Dimensions (Unit: mm)

Safety Instructions

Warning! Read the user manual before connecting the system to the power source.

Warning! To prevent the system from overheating, do not operate it in an area that exceeds the maximum operating temperature described in the user manual.

Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.

Support

IEI Support URL
http://new.ieiworld.com/tw/online_support_form

Compliance

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
- This device may not cause harmful interference, and
- 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

According to the requirement of the WEEE legislation the following user information is provided to customers for all branded IEI Electronics products subject to the WEEE directive.

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop o- your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.