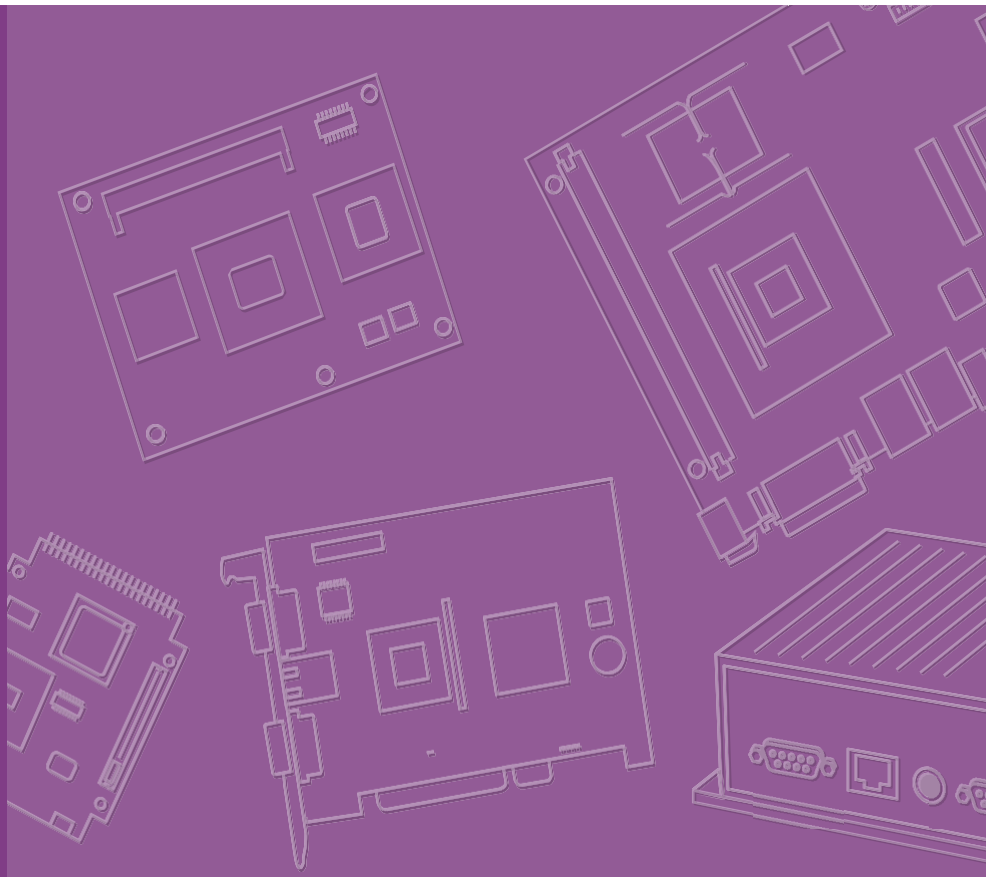
User Manual



AIMB-293

Mini-ITX Motherboard

Qualcomm Dragonwing IQ-X

ADVANTECH

Enabling an Intelligent Planet

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Warning: Always completely disconnect the power cord from the chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Warning: Always ground yourself to remove any static charge before touching the motherboard. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.

AIMB-293 user manual Ed 1 : 2006029300

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Chapter 1 General Information

1.1 Introduction

The AIMB-293 is a Mini-ITX form factor motherboard powered by the Qualcomm Dragonwing IQ-X SoC (model X1E-78-100), featuring 12 cores running at up to 3.4 GHz and delivering high-performance computing for a wide range of industrial and embedded applications. It supports up to 16 GB of LPDDR5 memory at 8533 MT/s and offers comprehensive I/O connectivity including 9x USB 3.2 Gen1x1 ports, 2x USB 2.0 ports, 4x serial (COM) ports, triple Gigabit Ethernet, dual DisplayPort 1.4 outputs, and LVDS display support. The board integrates Insyde EFI BIOS and is compatible with Advantech WISE-DeviceOn and embedded software APIs.

1.2 Features

- Qualcomm Dragonwing IQ-X SoC (X1E-78-100), 12 cores, up to 3.4 GHz
- Supports up to 16 GB LPDDR5 at 8533 MT/s (on SiP module, up to 64 GB)
- 1x M.2 M-Key 2280 slot (PCIe Gen4 x4) for high-speed NVMe SSDs
- 9x USB 3.2 Gen1x1 + 2x USB 2.0
- 3x Gigabit Ethernet (Realtek RTL8153BI-CG)
- 2x DisplayPort 1.4 (up to 4095x2160 @ 60Hz) + 1x LVDS dual channel 48-bit
- 4x COM ports (2x RS-232 with RI/5V/12V selectable, 2x RS-232/422/485)
- QFCS cooling system for compact and one-piece easy integration
- Insyde EFI BIOS with 512 Mbit SPI flash
- WISE-DeviceOn and Embedded Software APIs (H/W Monitor, Watchdog, GPIO)
- Mini-ITX form factor: 170 x 170 mm

1.3 Specifications

1.3.1 Processor

Parameter	Specification
SoC	Qualcomm Dragonwing IQ-X IQX7181MD / IQX5121MD
Cores	12
Max Speed	3.4 GHz
L2 Cache	36 MB
L3 Cache	6 MB
TDP	101.1 W
GPU	Adreno GPU architecture
TPM	fTPM (firmware TPM, inside SoC)

1.3.2 Memory

Parameter	Specification

Technology	LPDDR5
Frequency	8533 MT/s
Maximum Capacity	16 GB (on-board); SiP module supports up to 64 GB
ECC Support	No
Configuration	Integrated on SiP module (not user-upgradeable DIMM)

1.3.3 Graphics

Parameter	Specification
Controller	Adreno GPU architecture (integrated in SoC)
DisplayPort	2x DP 1.4, up to 4095x2160 @ 60Hz
LVDS	1x LVDS dual channel 48-bit, up to 1920x1200 @ 60Hz (default)
Multi-Display	Up to 2 independent displays

1.3.4 Network

Parameter	Specification
Speed	10/100/1000 Mbps Gigabit Ethernet
LAN1 Controller	Realtek RTL8153BI-CG 1GbE
LAN2 Controller	Realtek RTL8153BI-CG 1GbE
LAN3 Controller	Realtek RTL8153BI-CG 1GbE
Connector	3x RJ45

1.3.5 Audio

Parameter	Specification
Audio Codec	Realtek ALC5682I-VE-CG
Amplifier	Maximum 6W
Output	Audio amplifier header (AMP1), HD analog audio front panel (FPAUD1)

1.3.6 Storage

Parameter	Specification
Internal Storage	UFS 3.1 256 GB (on SiP module)
M.2 M-Key	1x M-Key 2280, PCIe Gen4 x4 (for NVMe SSD)
M.2 E-Key	1x E-Key 2230 (for Wi-Fi/Bluetooth module)
M.2 B-Key	1x B-Key 3052 (for 4G/5G module, USB3/USB2); compatible with Quectel RM520N-GL (Advantech P/N: 968DD00342)

1.3.7 I/O Interfaces

Interface	Description
USB (Rear)	6x USB 3.2 Gen1x1 Type-A

USB (Internal)	2x USB 3.2 Gen1x1 box header, 1x USB 3.2 Gen1x1 vertical Type-A, 2x USB 2.0 header
Serial Ports	2x RS-232 (COM1, COM2, with RI/5V/12V jumper select); 2x RS-232/422/485 (COM3, COM4)
Display	2x DisplayPort 1.4 (rear), 1x LVDS dual-channel 48-bit (internal)
Ethernet	3x RJ45 Gigabit (rear)
GPIO	1x 8-bit GPIO header
SIM Card	1x SIM card connector
Audio	1x AMP header (Max 6W), 1x HD front panel audio header

1.3.8 Power Requirements

Parameter	Specification
Input Voltage	12-24V DC-in (tolerance: min 10.8V – max 28V)
Rear Connector	Lockable DC-in connector (DCIN1, 3-pin)
Internal Connector	8-pin ATX power connector (ATX12V1)
ATX Standby	ATX 5VSB connector (ATX_5VSB1)

1.3.9 Environment & Mechanical

Parameter	Specification
Operating Temperature	0 ~ 60°C (32 ~ 140°F)
Storage Temperature	-40 ~ 85°C (-40 ~ 185°F)
Board Dimensions	170 mm x 170 mm (6.69" x 6.69")
Form Factor	Mini-ITX
Watchdog Timer	Programmable 1~255 seconds or minutes; output: system reset
BIOS	Insyde EFI, 512 Mbit SPI flash
OS Support	Windows 11 (with WISE-DeviceOn)
Certifications	CE, FCC, RoHS 2002/95/EC

1.4 Ordering Information

Part Number	QC SiP	Memory	UFS	LVDS/eDP	DP	GbE	COM	USB3.2	USB2.0
AIMB-29300-00A1	IQX7181MD	16G	1	1	2	3	4	9	2
AIMB-2930L-00A1	IQX5121MD	16G	1	1	2	3	4	9	2

1.5 Packing List

Part Number	Description	Quantity
1960120780N001	I/O port bracket	1

1970006458T001	QFCS cooling system	1
1700035216-01	A Cable PH JACK D3.5x2/2x5P-2.54 20cm, audio jack	1
1700020277-01	M Cable 2x10P-2.0/USB-A 9P(F)x2 30CM W/BKT	1
1700034405-01	M Cable USB-A 4P(F)x2/2x5P-2.0 50cm	1
1700034404-02	F Cable D-SUB 9P(M)/2x5P-2.0 50cm	1
19350304A0	M.2 Screw, M3x4L	3
2046029300	Startup manual for AIMB-293	1

1.6 Optional Accessories

Part Number	Description
1700020277-01	USB 3.0 cable 30cm with I/O bracket
1700034405-01	USB 2.0 cable, 50cm
1700034404-02	Serial ports cable, 50cm
968DD00342	Quectel RM520N-GL 5G module (M.2 B-Key)
AIW-173BQ-GI1	Qualcomm WCN7851 Wi-Fi 7 M.2 2230 BT-USB

1.7 Safety Precautions

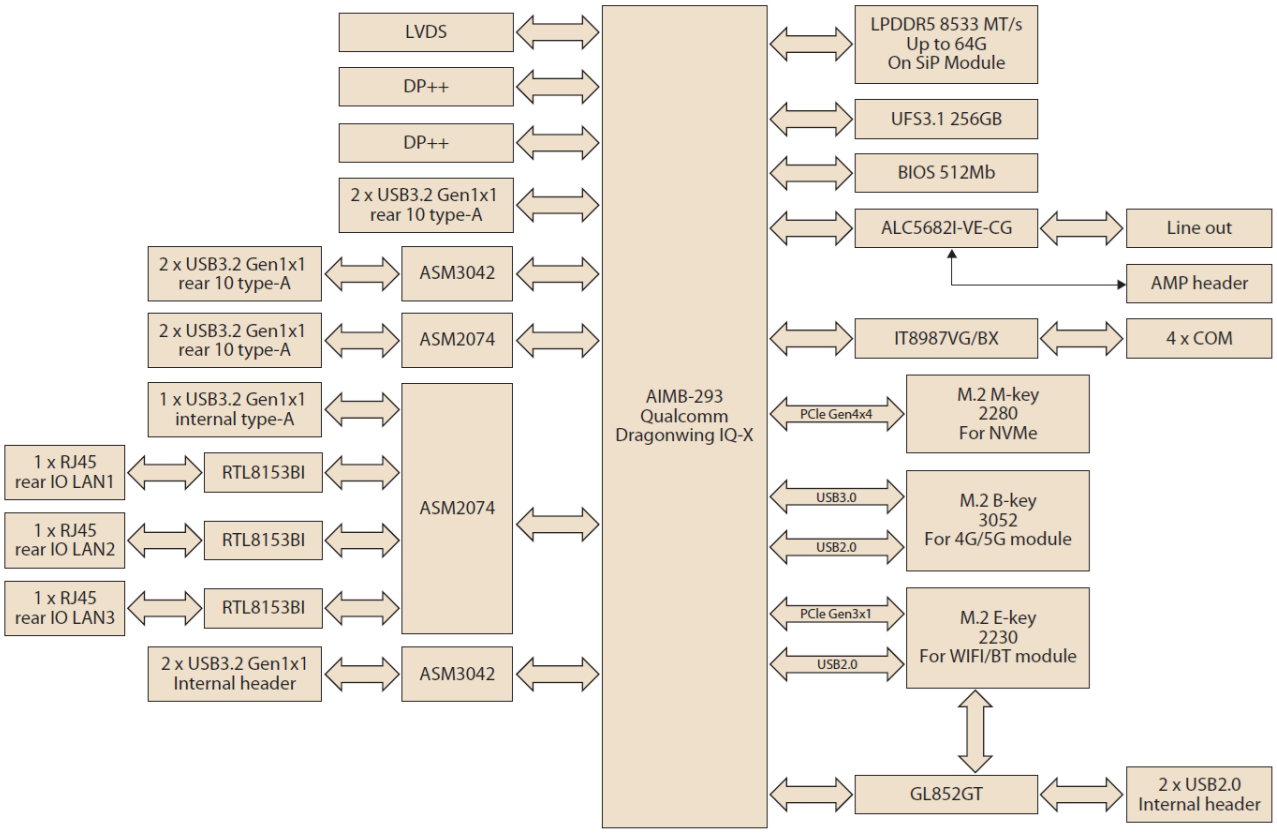
Warning: Always completely disconnect the power cord from the chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Warning: Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electrostatic discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.

Warning: The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

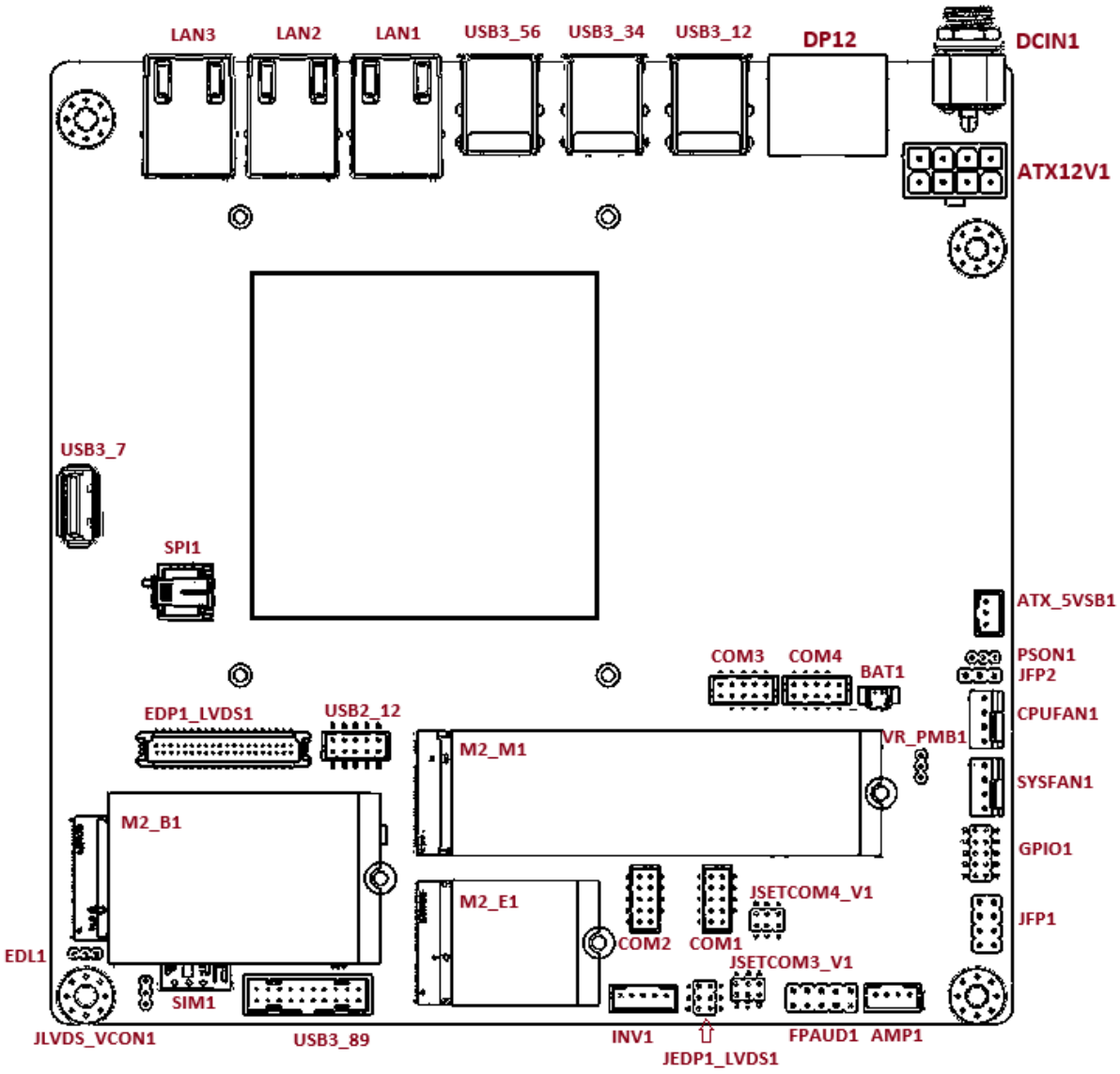
1.8 Block Diagram

The following block diagram illustrates the functional architecture of the AIMB-293 board:

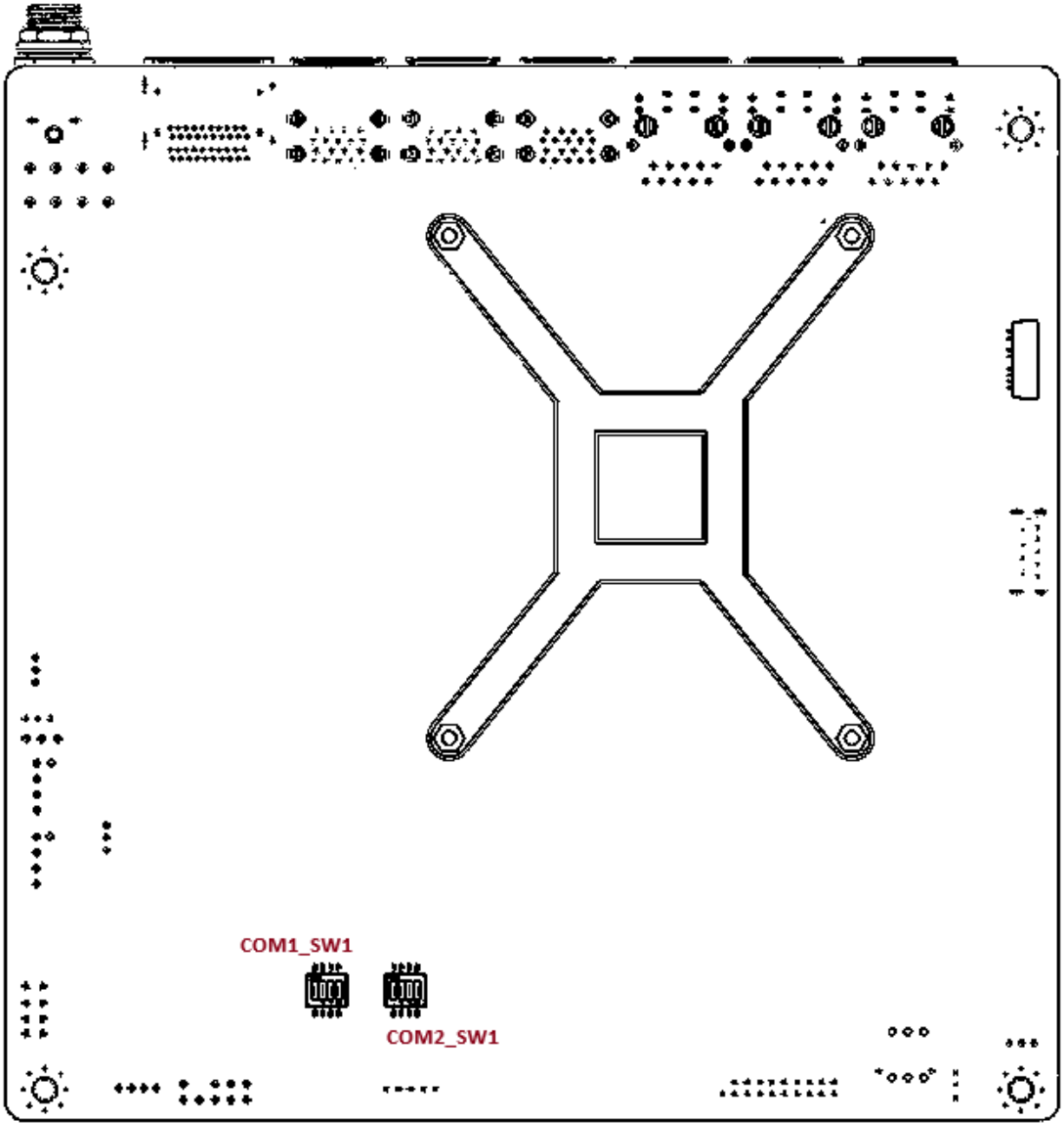


Subsystem	Components / Connectivity
Qualcomm Dragonwing IQ-X SoC	Core processor, Adreno GPU, fTPM, PCIe Gen4/Gen3 host
Memory (on SiP)	LPDDR5 8533 MT/s, up to 64 GB
Storage (on SiP)	UFS 3.1 256 GB; BIOS 512 Mb SPI flash
Display Output	2x DP++ (rear) via SoC; 1x LVDS dual-channel (internal header)
USB Hub / Switch	ASM3042, ASM2074 hubs driving 6x rear USB3.2 + 1x internal Type-A + 2x box header
USB 2.0 Hub	GL852GT driving 2x USB2.0 internal header
Ethernet	3x Realtek RTL8153BI-CG 1GbE via ASM2074 USB hub
Serial COM	IT8987VG/BX SuperI/O: 4x COM ports
Audio	Realtek ALC5682I-VE-CG codec + amplifier header
M.2 M-Key	PCIe Gen4 x4 NVMe SSD
M.2 B-Key	4G/5G module via USB3.0 + USB2.0
M.2 E-Key	Wi-Fi/Bluetooth via PCIe Gen3 x1 + USB2.0

Top view


LAN3
LAN2
LAN1
USB3_56
USB3_34
USB3_12
DP12
DCIN1
ATX12V1
USB3_7
SPI1
ATX_5VSB1
COM3
COM4
BAT1
PSON1
JFP2
EDP1_LVDS1
USB2_12
CPUFAN1
VR_PMB1
M2_M1
SYSFAN1
M2_B1
GPIO1
M2_E1
JSETCOM4_V1
JFP1
COM2
COM1
EDL1
JSETCOM3_V1
SIM1
JLVDS_VCON1
USB3_89
INV1
FPAUD1
AMP1
JEDP1_LVDS1

Bottom view



Chapter 2 Connectors & Jumpers

2.1 Introduction

This chapter describes all connectors, headers, and jumper settings available on the AIMB-293 motherboard. Each connector is identified by its reference designator (part reference), physical location, and pin assignment table. Jumper settings are described with their function and default configurations.

2.2 Connector & Header Summary

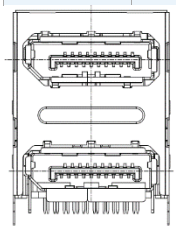
Item	Description	Part Reference
1	Dual DisplayPort (rear)	DP12
2	USB 3.2 Gen1x1 stack connector x2 (rear)	USB3_12
3	USB 3.2 Gen1x1 stack connector x2 (rear)	USB3_34
4	USB 3.2 Gen1x1 stack connector x2 (rear)	USB3_56
5	RJ45 GbE port (rear)	LAN1
6	RJ45 GbE port (rear)	LAN2
7	RJ45 GbE port (rear)	LAN3
8	Internal USB 3.2 Gen1x1 vertical connector	USB3_7
9	Internal USB 2.0 connector x2	USB2_12
10	eDP / LVDS connector	EDP1_LVDS1
11	Power LED pin header	JFP2
12	SPI BIOS flash socket	SPI1
13	M.2 B-Key connector	M2_B1
14	M.2 E-Key connector	M2_E1
15	M.2 M-Key connector	M2_M1
16	Internal USB 3.2 Gen1 pin header x2	USB3_89
17	COM1 connector (RS-232)	COM1
18	COM2 connector (RS-232)	COM2
19	COM3 connector (RS-232/422/485)	COM3
20	COM4 connector (RS-232/422/485)	COM4
21	COM3 RI# / 5V / 12V selection	JSETCOM3_V1
22	COM4 RI# / 5V / 12V selection	JSETCOM4_V1
23	8-bit GPIO pin header	GPIO1
24	SIM card connector	SIM1
25	CMOS battery connector	BAT1
26	eDP/LVDS backlight inverter power connector	INV1
27	eDP/LVDS panel voltage selection	JEDP1_LVDS1
28	PWRBTN# / RESET# / HDD LED / SMBus header	JFP1
29	CPU fan connector	CPUFAN1

30	System fan connector	SYSFAN1
31	VCORE programming header	VR_PMB1
32	ATX 8-pin power connector (180°)	ATX12V1
33	ATX 5V / PSON connector	ATX_5VSB1
34	AT / ATX mode selection	PSON1
35	12V~24V DC power supply connector (rear, lockable)	DCIN1
36	Audio amplifier output pin header	AMP1
37	HD analog audio front panel header	FPAUD1
38	VESA & JEIDA LVDS support select	JLVDS_VCON1
39	COM1 mode select (RS-232/422/485)	COM1_SW1
40	COM2 mode select (RS-232/422/485)	COM2_SW1
41	Force USB_P0 download mode header	EDL1

2.3 Pin Assignments

2.3.1 Dual DisplayPort (DP12)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
P1	DP0_0+	P21	DP1_0+	P2	GND	P22	GND
P3	DP0_0-	P23	DP1_0-	P4	DP0_1+	P24	DP1_1+
P5	GND	P25	GND	P6	DP0_1-	P26	DP1_1-
P7	—	P27	—	P8	GND	P28	GND
P9	—	P29	—	P10	—	P30	—
P11	GND	P31	GND	P12	—	P32	—
P13	—	P33	—	P14	—	P34	—
P15	DP0_AUX+	P35	DP1_AUX+	P16	GND	P36	GND
P17	DP0_AUX-	P37	DP1_AUX-	P18	DP0_HPD	P38	DP1_HPD
P19	GND	P39	GND	P20	+3.3V	P40	+3.3V

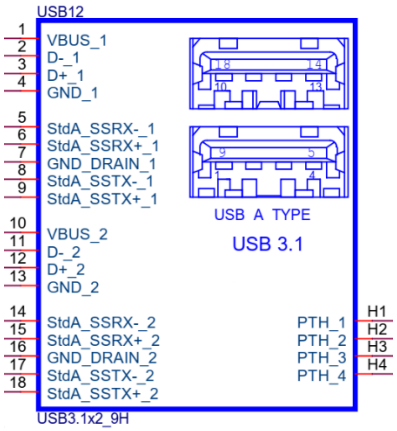


2.3.2 USB 3.2 Stack Connectors (USB3_12, USB3_34, USB3_56)

Each USB 3.2 stack connector provides two USB 3.2 Gen1x1 ports with the following pin assignment:

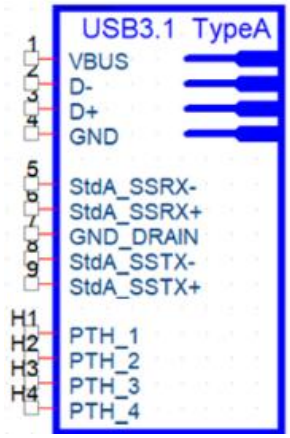
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+5V	10	+5V	2	USB2_D0-	11	USB2_D1-
3	USB2_D0+	12	USB2_D1+	4	GND	13	GND
5	USB3_P0_RX-	14	USB3_P1_RX-	6	USB3_P0_RX+	15	USB3_P1_RX+
7	GND	16	GND	8	USB3_P0_TX-	17	USB3_P1_TX-

9	USB3_P0_TX+	18	USB3_P1_TX+				



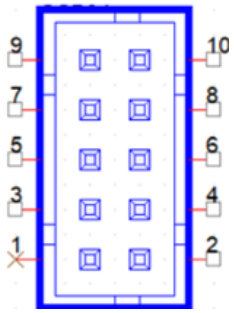
2.3.3 Internal USB 3.2 Gen1x1 Vertical Connector (USB3_7)

Pin	Signal
1	+5V
2	USB2_D0-
3	USB2_D0+
4	GND
5	USB3_P0_RX-
6	USB3_P0_RX+
7	GND
8	USB3_P0_TX-
9	USB3_P0_TX+



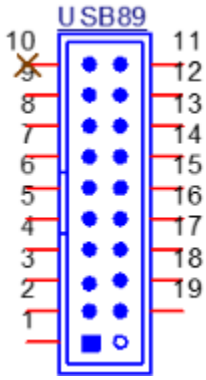
2.3.4 Internal USB 2.0 Connector (USB2_12)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	N.C	2	GND	3	GND	4	GND
5	D+	6	D+	7	D-	8	D-
9	VBUS	10	VBUS				



2.3.5 Internal USB 3.2 Gen1 Header (USB3_89)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+USBV34	11	USB2_D14+	2	USB31_P3_RX-	12	USB2_D14-
3	USB31_P3_RX+	13	GND	4	GND	14	USB31_P4_TX+
5	USB31_P3_TX-	15	USB31_P4_TX-	6	USB31_P3_TX+	16	GND
7	GND	17	USB31_P4_RX+	8	USB2_D9-	18	USB31_P4_RX-
9	USB2_D9+	19	+USBV34				

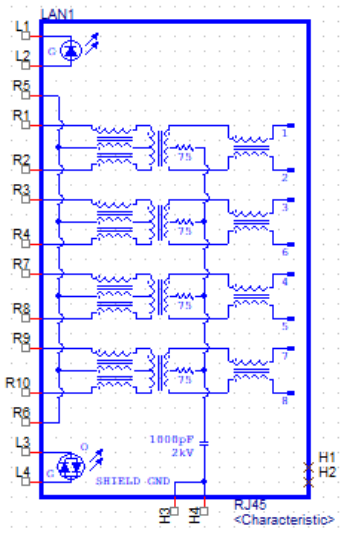


2.3.6 RJ45 GbE Connectors (LAN1, LAN2, LAN3)

Each RJ45 connector has the same pin-out. The example below uses LAN1:

Pin	Signal
L1	LAN_LED1_ACT#
L2	+V3.3_DUAL
L3	LAN_LED2_1G#
L4	LAN_LED0_100M#
R1	MDI0+
R2	MDI0-
R3	MDI1+
R4	MDI1-
R5	LAN_CONN
R6	LAN_CT
R7	MDI2+
R8	MDI2-
R9	MDI3+
R10	MDI3-

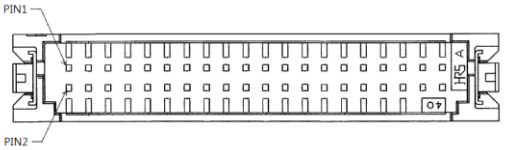
H3	GND
H4	GND



2.3.7 eDP / LVDS Connector (EDP1_LVDS1)

LVDS Mode Pin Assignment:

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	VDD	2	VDD	3	LVDS DETECT#	4	GND
5	VDD	6	VDD	7	LVDS_OD0-	8	LVDS_ED0-
9	LVDS_OD0+	10	LVDS_ED0+	11	GND	12	GND
13	LVDS_OD1-	14	LVDS_ED1-	15	LVDS_OD1+	16	LVDS_ED1+
17	GND	18	GND	19	LVDS_OD2-	20	LVDS_ED2-
21	LVDS_OD2+	22	LVDS_ED2+	23	GND	24	GND
25	LVDS_OCK-	26	LVDS_ECK-	27	LVDS_OCK+	28	LVDS_ECK+
29	GND	30	GND	31	N.C	32	N.C
33	GND	34	GND	35	LVDS_OD3-	36	LVDS_ED3-
37	LVDS_OD3+	38	LVDS_ED3+	39	N.C	40	LVDS VCON



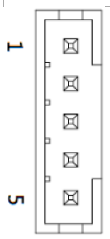
eDP Mode Pin Assignment:

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	VDD	2	VDD	3	LVDS DETECT#	4	GND
5	VDD	6	VDD	7	EDP_TX2-	8	N.C
9	EDP_TX2+	10	N.C	11	GND	12	GND
13	EDP_TX1-	14	N.C	15	EDP_TX1+	16	N.C
17	GND	18	GND	19	EDP_TX0-	20	N.C
21	EDP_TX0+	22	N.C	23	GND	24	GND

25	EDP_TX3-	26	N.C	27	EDP_TX3+	28	N.C
29	GND	30	GND	31	EDP_AUX+	32	EDP_AUX-
33	GND	34	EDP_HPD	39	N.C	40	GND

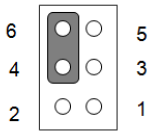
2.3.8 eDP/LVDS Backlight Inverter Power Connector (INV1)

Pin	Signal
1	+12V
2	GND
3	BKL EN
4	BKL CTRL
5	+5V



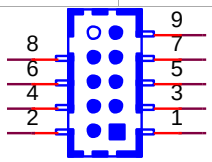
2.3.9 EDP Panel / LVDS Panel Voltage Selection (JEDP1_LVDS1)

Pin	Signal	Pin	Signal
1	NC	2	+5V
3	+12V	4	VDD
5	NC	6	+3.3V



2.3.10 COM1 Connector (COM1) — RS-232

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	NA	2	SIN	3	SOUT	4	NA
5	GND	6	NA	7	RTS#	8	CTS#
9	RI						



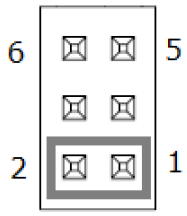
2.3.11 COM2 Connector (COM2) — RS-232

Same pin assignment as COM1.

2.3.12 COM3 Connector (COM3) — RS-232/422/485

Same physical pin assignment as COM1/COM2. Mode (RS-232/422/485) is selected via COM3_SW1 DIP switch.

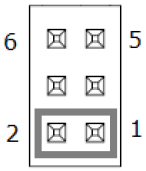
Pin	Signal	Pin	Signal
1	RI# [1]	2	Advantech define
3	Advantech define	4	+5V
5	+12V	6	Advantech define



2.3.13 COM4 Connector (COM4) — RS-232/422/485

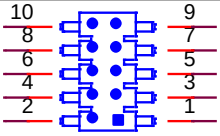
Same physical pin assignment as COM1/COM2. Mode is selected via COM4_SW1 DIP switch.

Pin	Signal	Pin	Signal
1	RI# [1]	2	Advantech define
3	Advantech define	4	+5V
5	+12V	6	Advantech define



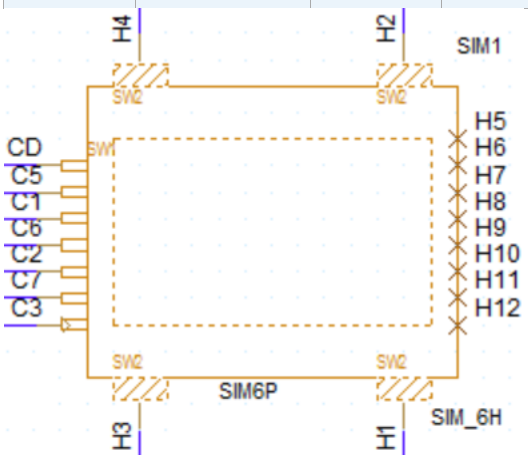
2.3.14 8-bit GPIO Pin Header (GPIO1)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO4	3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6	7	GPIO3	8	GPIO7
9	5V_GPIO_VCC	10	GND				



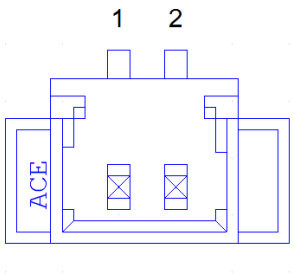
2.3.15 SIM Card Connector (SIM1)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
C1	VCC	C5	GND	C2	RST	C6	VPP
C3	CLK	C7	DATA	CD	SIM_DETECT		



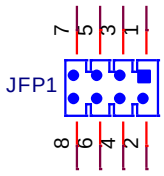
2.3.16 CMOS Battery Connector (BAT1)

Pin	Signal
1	+VBAT
2	GND



2.3.17 Power Button / Reset / HDD LED / SMBus (JFP1)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	HDD_LED+	2	PWRBTN#	3	HDD_LED-	4	GND
5	SMB_DAT	6	SYS_RESET#	7	SMB_CLK	8	GND



2.3.18 Power LED Header (JFP2)

Pin	Signal
1	Power LED+
2	NC

3	Power LED-



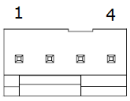
2.3.19 CPU Fan Connector (CPUFAN1)

Pin	Signal
1	GND
2	CPU FAN VCC
3	CPU FAN SPEED
4	CPU FAN PWM



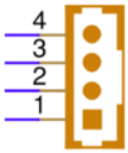
2.3.20 System Fan Connector (SYSFAN1)

Pin	Signal
1	GND
2	FAN VCC
3	FAN SPEED
4	FAN PWM



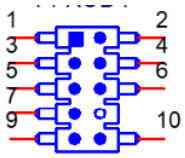
2.3.21 Audio Amplifier Output (AMP1)

Pin	Signal
1	AMP OUT – R+
2	AMP OUT – R-
3	AMP OUT – L-
4	AMP OUT – L+



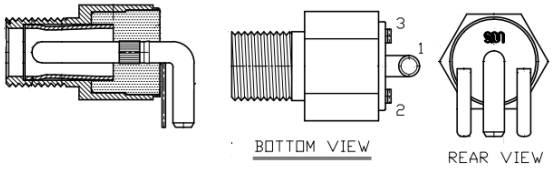
2.3.22 HD Analog Audio Front Panel (FPAUD1)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	MIC2-L	2	GND_A	3	MIC2-R	4	AFP_PRESEN#
5	LINE2-R	6	MIC2-JD	7	FIO_SENSE	8	NA
9	LINE2-L	10	LINE2-JD				



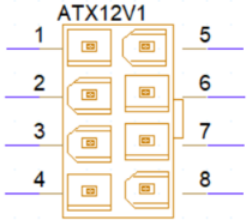
2.3.23 DC Power Input Connector (DCIN1)

Pin	Signal
1	+12V ~ +24V
2	GND
3	GND



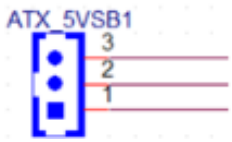
2.3.24 ATX 8-Pin Power Connector (ATX12V1)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	3	GND	4	GND
5	DCin_12_24V	6	DCin_12_24V	7	DCin_12_24V	8	DCin_12_24V



2.3.25 ATX 5VSB / PSON Connector (ATX_5VSB1)

Pin	Signal
1	ATX_5V
2	GND
3	PS_ON#



2.3.26 AT/ATX Mode selection(PSON1)

Pin	Signal
1	VCCAT
2	+V3_Pull High
3	VCCATX



2.3.27 VCORE Programming Header (VR_PMB1)

Pin	Signal
1	VR_SDATA
2	GND
3	VR_SCLK



Chapter 3 Jumper Settings

3.1 How to Set Jumpers

A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them.

- To CLOSE (turn ON) a jumper: connect the pins with the clip.
- To OPEN (turn OFF) a jumper: remove the clip.
- Some jumpers have three pins labeled 1, 2, and 3 — connect either pins 1-2 or pins 2-3.

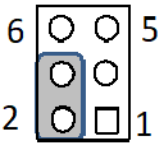
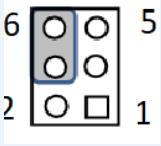
Note: *A pair of needle-nose pliers may be useful when setting jumpers. Always power off the system before changing jumper settings.*

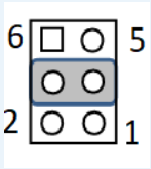
3.2 Jumper Summary

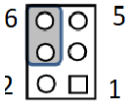
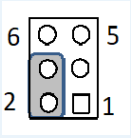
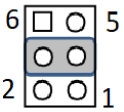
Item	Description	Part Reference
1	eDP Panel / LVDS Panel Voltage Selection	JEDP1_LVDS1
2	Force USB_P0 Download Mode	EDL1
3	COM3 RI# / 5V / 12V Selection	JSETCOM3_V1
4	COM4 RI# / 5V / 12V Selection	JSETCOM4_V1
5	AT / ATX Mode Selection	PSON1
6	VESA & JEIDA LVDS Support Select	JLVDS_VCON1
7	COM1 Mode Select (RS-232/422/485)	COM1_SW1
8	COM2 Mode Select (RS-232/422/485)	COM2_SW1

3.3 eDP Panel / LVDS Panel Voltage Selection (JEDP1_LVDS1)

This jumper selects the panel supply voltage for the connected LVDS or eDP display.

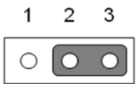
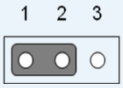
Function	Jumper Setting
Jumper position for 5V	
Jumper position for 3.3V (Default)	

Jumper position for 12V	

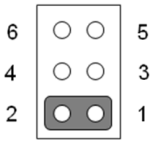
Function	Jumper Setting	Pins
3.3V (Default)	Connect pins 4-6	4-6 
5V	Connect pins 2-4	2-4 
12V	Connect pins 3-4 (alt)	3-4 (refer to board markings) 

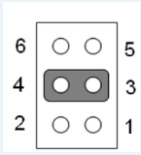
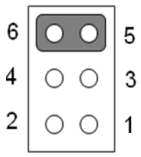
Note: *Default setting is 3.3V. Verify panel specifications before changing voltage.*

3.4 Force USB_P0 Download Mode (EDL1)

Function	Pins
Normal operation — 100K to GND (Default)	EDL1 (2-3) 
Force download mode — 100K to +V3.3_DUAL	EDL1 (1-2) 

3.5 COM3 RI# / 5V / 12V Selection (JSETCOM3_V1)

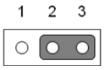
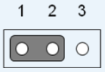
Function	Jumper Setting
RI# (Default)	Pins 1-2 short 

+5V	Pins 3-4 short 
+12V	Pins 5-6 short 

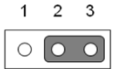
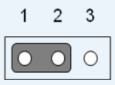
3.6 COM4 RI# / 5V / 12V Selection (JSETCOM4_V1)

Same configuration as JSETCOM3_V1 (see section 3.5).

3.7 AT / ATX Mode Selection (PSON1)

Function	Pins
ATX Mode (Default) — system needs power button press to turn on	PSON1 (2-3) 
AT Mode — system powers on automatically when AC is applied	PSON1 (1-2) 

3.8 VESA & JEIDA LVDS Support Select (JLVDS_VCON1)

Function	Pins
GND / JEIDA (Default)	JLVDS_VCON1 (2-3) 
100 ohm to +V3.3 / VESA	JLVDS_VCON1 (1-2) 

3.9 COM1 Mode Select (COM1_SW1)

Mode	DIP Switch Setting
RS-232 (Default)	

RS-422	
RS-422 (with termination)	
RS-485	
RS-485 (with termination, transmitter)	
RS-485 (with termination, receiver)	
Loopback (test)	

Note: *COM2 (COM2_SW1) has the same DIP switch configuration options as COM1.*

Chapter 4 BIOS Operation

4.1 Introduction

The AIMB-293 uses Insyde EFI BIOS stored in a 512 Mbit SPI flash chip. The BIOS Setup utility allows users to configure system settings, I/O interfaces, boot order, watchdog timers, and other hardware-level parameters. The settings are stored in CMOS RAM backed by the onboard coin-cell battery.

4.2 Entering BIOS Setup

Power on or restart the system. During POST (Power-On Self-Test), press the <Esc> key to enter the BIOS Setup Utility.

Control Keys

Key	Action
<↑> <↓> <←> <→>	Move to select item
<Enter>	Select item or enter sub-menu
<Esc>	Exit current page / return to Main Menu
<Page Up> / <+>	Increase value or make change
<Page Down> / <->	Decrease value or make change
<F1>	General help
<F2>	Item help
<F5>	Load previous values
<F7>	Load setup defaults
<F10>	Save all changes and exit

4.3 BIOS Main Menu

The Main Menu displays system information including BIOS version, memory size, and current date/time. Use arrow keys to navigate between menu tabs.

- System Date: Set current date (MM/DD/YY format)
- System Time: Set current time (HH:MM:SS format)
- Memory Information: Displays installed memory frequency



4.4 Advanced BIOS Features

The Advanced menu provides configuration for:

- CPU Configuration — core parameters, virtualization (VT), performance settings
- Power & Performance — CPU power management, turbo boost, C-state settings
- Trusted Computing — TPM 2.0 firmware settings (fTPM embedded in SoC)
- ACPI Settings — S3 sleep state, hibernation
- Hardware Monitor — fan speed monitoring, temperature readouts, voltage levels
- Embedded Controller Configuration — serial port UART assignment, GPIO control, watchdog timer, wake-on-ring
- USB Configuration — XHCI hand-off, USB mass storage
- Network Stack Configuration — UEFI PXE boot support

4.5 Watchdog Timer

The AIMB-293 features a programmable watchdog timer that can trigger a system reset if the software fails to respond within the defined interval.

- Interval: Programmable from 1 to 255 units

- Unit: Selectable between seconds and minutes
- Output: System reset

The watchdog timer is configured in the BIOS under: Advanced > Watch Dog Timer.> Enable / Disable

Note: *Ensure application software implements watchdog heartbeat before enabling this feature in production systems.*



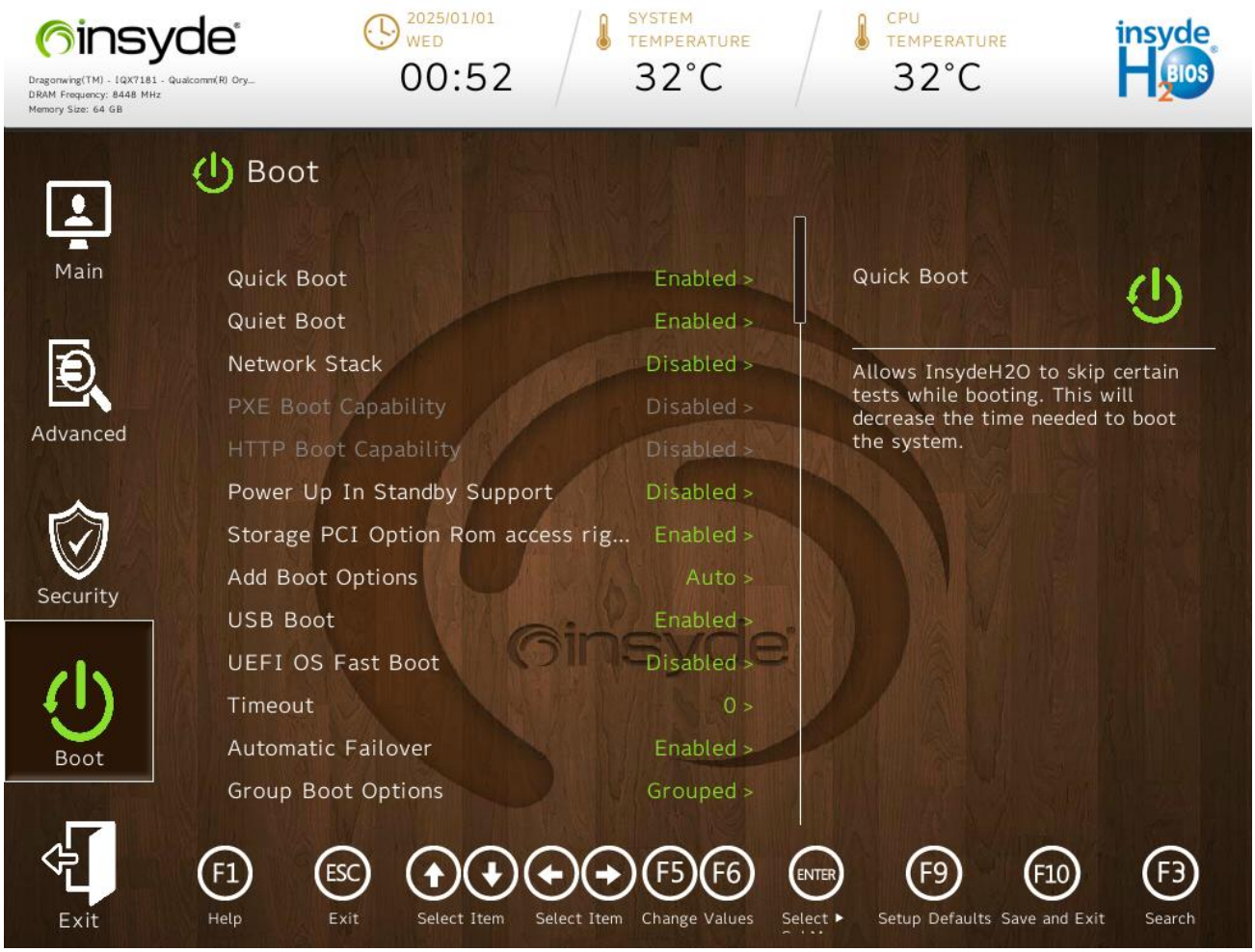
4.6 Security Settings

The Security menu provides options to set an Administrator and User password. If only the Administrator password is set, access to Setup is restricted. The password length must be between 3 and 20 characters. Secure Boot configuration is also available in this menu.

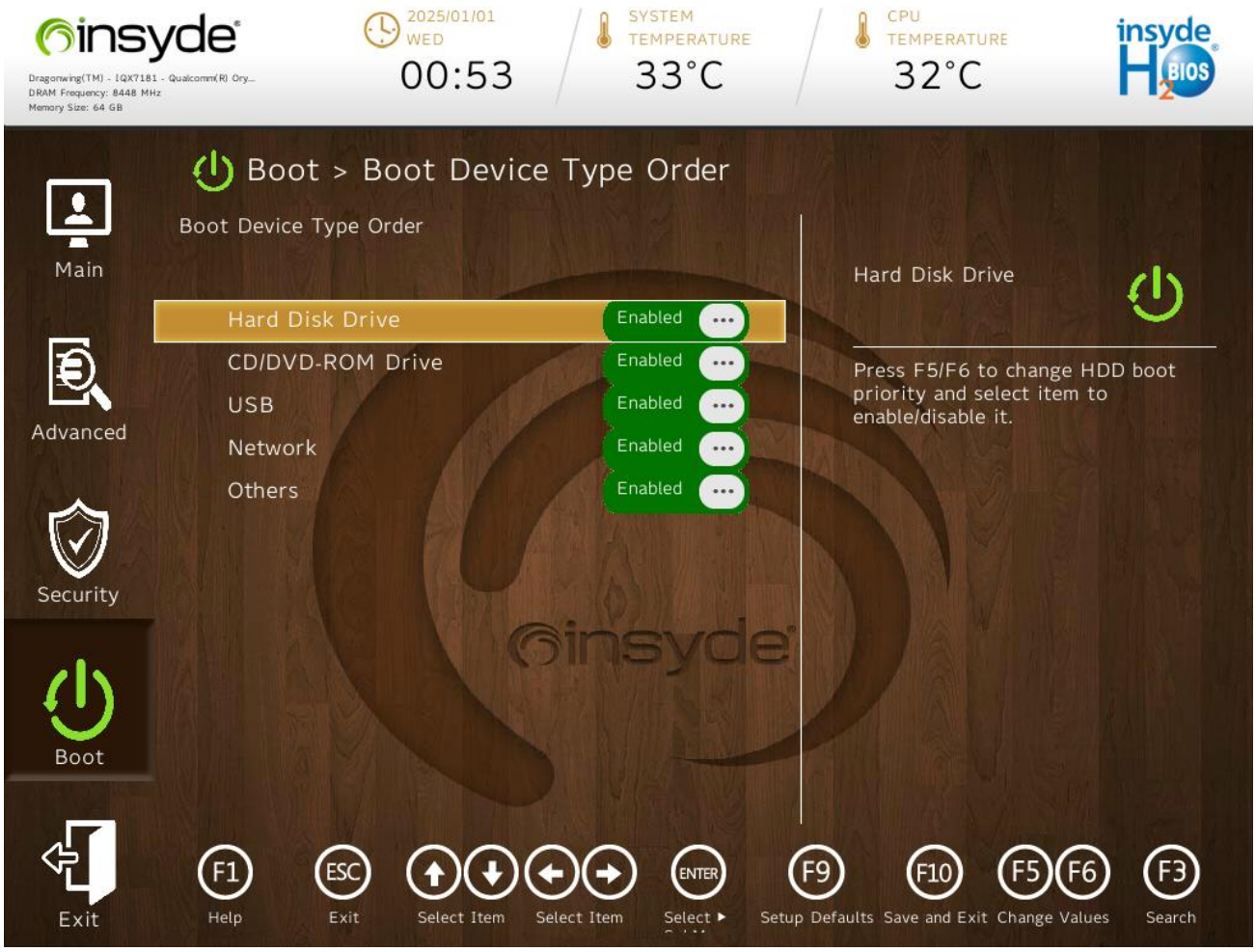


4.7 Boot Settings

Configure boot device priority and timeout. The Setup Prompt Timeout (default: 1 second) determines how long the system waits for a keypress before auto-booting.



Boot > Boot Device Type Order > Define the boot devices priority



4.8 Save & Exit Configuration

Option	Action
Save Changes and Exit	Save all changes to CMOS and reboot
Discard Changes and Exit	Exit without saving
Save Changes and Reset	Save and perform warm reset
Restore Defaults	Load factory BIOS defaults
Save as User Defaults	Save current settings as user defaults



Chapter 5 Software Introduction & APIs

5.1 Introduction

The mission of Advantech Embedded Software Services is to enhance quality of life with Advantech platforms and embedded technology. The AIMB-293 supports Advantech WISE-DeviceOn for device management and a comprehensive set of Embedded Software APIs.

5.2 WISE-DeviceOn

WISE-DeviceOn is Advantech's IoT device management platform, enabling remote monitoring, configuration, firmware updates, and diagnostics for industrial devices. The AIMB-293 is designed to work seamlessly with WISE-DeviceOn under Windows 11.

5.3 Software APIs

5.3.1 Control APIs

API	Description
GPIO	General Purpose Input/Output — monitor signal levels or set output states; supports programmable GPIO for dynamic configuration

5.3.2 Display APIs

API	Description
Brightness Control	Programmatically adjust display brightness levels
Backlight	Control display backlight on/off state

5.3.3 Monitor APIs

API	Description
Watchdog	Programmable watchdog timer — triggers system reset after defined timeout if not refreshed
Hardware Monitor (HWM)	System health supervision — monitors fan speed, temperature, and voltage

5.4 Software Utilities

Utility	Description
BIOS Flash	Update flash ROM BIOS version or back up current BIOS to disk; includes command-line version and API
Embedded Security ID	Provides reliable security functions to protect application data within the embedded BIOS
Monitoring	System health monitoring utility — tracks voltage, CPU/system temperature, and fan speed

5.5 Driver Installation

All required drivers and utilities for the AIMB-293 are available from the Advantech support website:

http://support.advantech.com/Support/

Note: *Download and decompress driver packages before installation. Always install drivers in the correct order as documented in the platform release notes.*

Chapter 6 LAN Configuration

6.1 Introduction

The AIMB-293 features three independent Gigabit Ethernet ports (LAN1, LAN2, LAN3), each driven by a dedicated Realtek RTL8153BI-CG USB-to-GbE controller connected via the internal USB hub. All three ports support 10/100/1000 Mbps auto-negotiation.

6.2 Features

- Three independent Realtek RTL8153BI-CG GbE controllers
- Supports 10/100/1000 Mbps speeds with auto-negotiation
- USB 3.2 Gen1 host interface via internal ASM2074 hub
- Wake-on-LAN (WOL) support
- Full-duplex operation
- IEEE 802.3az (Energy Efficient Ethernet) support

6.3 Driver Installation

Download the Realtek USB GbE driver from the Advantech support website. Extract the driver package and run the SETUP program. Follow the on-screen instructions to complete installation.

Note: *The drivers are compressed. Do not manually copy driver files. Use the supplied SETUP program to install the drivers.*

6.4 Network Configuration

After driver installation, the three LAN adapters will appear in Device Manager and Network Connections. Each port can be independently configured with a static IP or assigned via DHCP. The ports are identified as LAN1, LAN2, and LAN3 in the operating system.

Appendix A Regulatory Compliance

A.1 FCC Class B Declaration

This equipment has been tested and found to comply with the limits for a Class B 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 the instructions, may cause harmful interference to radio communications.

If this equipment does cause harmful interference to radio or television reception, 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 into an outlet on a different circuit from the receiver
- Consult the dealer or an experienced radio/TV technician for assistance

A.2 CE Declaration

This product complies with the requirements of the following EU directives and standards: EMC Directive 2014/30/EU, Low Voltage Directive 2014/35/EU, and RoHS Directive 2011/65/EU (2002/95/EC).

A.3 RoHS Compliance

The AIMB-293 motherboard is RoHS compliant (2002/95/EC). It does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), or polybrominated diphenyl ethers (PBDE) above threshold concentrations.

Appendix B Technical Support & Contact

For technical support, driver downloads, and documentation:

- Website: www.advantech.com
- Support Portal: http://support.advantech.com
- Product Page: www.advantech.com/products

All product specifications are subject to change without notice. This document is preliminary. Last updated: June 2026.

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