NVIDIA Jetson® AI BOX – Ultra Board Series

Full Systems & Kits
for NVIDIA Jetson® Nano, Xavier NX, TX2 NX

User's Manual

Ultra Board Series
Full Systems

Ultra Board Series
Kit

EverFocus

NVIDIA Jetson® AI BOX
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User's Manual

Disclaimer

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Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references.

➢ All cautions and warnings on the device should be noted.

➢ All cables and adapters supplied by EverFocus are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by EverFocus to prevent system malfunction or fires.

➢ Make sure the power source matches the power rating of the device.

➢ Position the power cord so that people cannot step on it. Do not place anything over the power cord.

➢ Always completely disconnect the power before working on the system's hardware.

➢ No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.

➢ If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.

➢ Always disconnect this device from any AC supply before cleaning.

➢ While cleaning, use a damp cloth instead of liquid or spray detergents.

➢ Make sure the device is installed near a power outlet and is easily accessible.

➢ Keep this device away from humidity.

➢ Place the device on a solid surface during installation to prevent falls.

➢ Do not cover the openings on the device to ensure optimal heat dissipation.

➢ Watch out for high temperatures when the system is running.

➢ Do not touch the heat sink or heat spreader when the system is running.

➢ Never pour any liquid into the openings. This could cause fire or electric shock.

➢ As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

➢ If any of the following situations arises, please contact our service personnel (ts@everfocus.com.tw):

  - Damaged power cord or plug
  - Liquid intrusion to the device
  - Exposure to moisture
  - Device is not working as expected or in a manner as described in this manual
  - The device is dropped or damaged
  - Any obvious signs of damage displayed on the device

➢ DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE SPECIFICATION) TO PREVENT DAMAGE.

FCC Statement

Warning!

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

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.

Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

TABLE OF CONTENTS

1.   Introduction

EverFocus Ultra Board Series (UB Series) are compact edge AI devices for NVIDIA Jetson® Nano, Xavier NX, TX2 NX, which are divided into full systems and kits for flexible uses. The full systems, eNVP-JNN-AI-UB000, eNVP-JNX-AI-UB000 and eNVP-JTX-AI-UB000, are compact AI Boxes based on NVIDIA® Jetson™ for general and commercial markets. With ARM® Cortex®-A57 MPCore processor and rich interfaces including HDMI display output, USB, COM, and GbE, the UB Series aim to deliver high-quality performance for multiple computing applications. Installed with EverFocus in-house designed software, these products provide basic NVR functions of real-time live view, video recording, video playback, alarm notification and etc.

1.1   Features

| eNVP-JNN-AI-UB000 & UB Kit for Jetson® Nano	eNVP-JNX-AI-UB000 & UB Kit for Jetson® Xavier NX	eNVP-JTX-AI-UB000 & UB Kit for Jetson® TX2 NX
● Quad-Core Arm® Cortex®-A57 MPCore processor ● 128-core NVIDIA Maxwell™ GPU ● Onboard 4 GB 64-bit LPDDR4 memory (25.6GB/s)	● Quad-Core Arm® Cortex®-A57 MPCore processor ● 128-core NVIDIA Maxwell™ GPU ● Onboard 4 GB 64-bit LPDDR4 memory (25.6GB/s)	● Dual-Core NVIDIA Denver 2 64-Bit CPU and Quad-Core Arm® Cortex®-A57 MPCore processor ● 256-core NVIDIA Pascal™ GPU ● Onboard 4 GB 128-bit LPDDR4 memory
● Supports GbE x 1	● Supports GbE x 2	● Supports GbE x 2
--	● Supports M.2 E-key 2030 x 1 (for WiFi/BT module)	● Supports M.2 E-key 2030 x 1 (for WiFi/BT module)
● Fanless AI edge embedded box PC ● Supports CAN bus x 1 ● Supports USB3.0 x 3, USB2.0 x 1 ● Supports MicroUSB x 1 (for Flash OS) ● Supports M.2 M-key 2280 x 1 (for NVMe SSD) ● Supports M.2 B-key 3052/3042 x 1 (for 5G/4G) ● Supports UART x 1, RS485 x 1, I2C x 2, SPI x 2, GPIO x 6, +5V Output x 2, +3.3V Output x 2 ● DC 12V input		

** For more details about the model spec, please refer to *Chapter 3 Specification.*
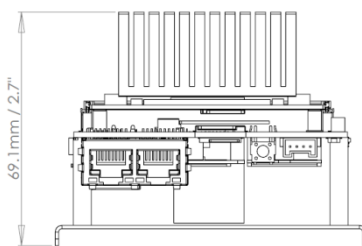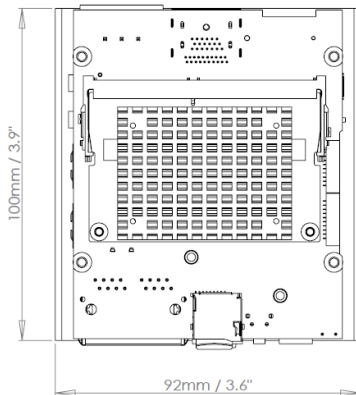
1.2 Dimensions

1.2.1. UB Full Systems

↑ eNVP-JNN-AI-UB000

(GbE x 1)

↑ eNVP-JNX-AI-UB000 / eNVP-JTX-AI-UB000

(GbE x 2)
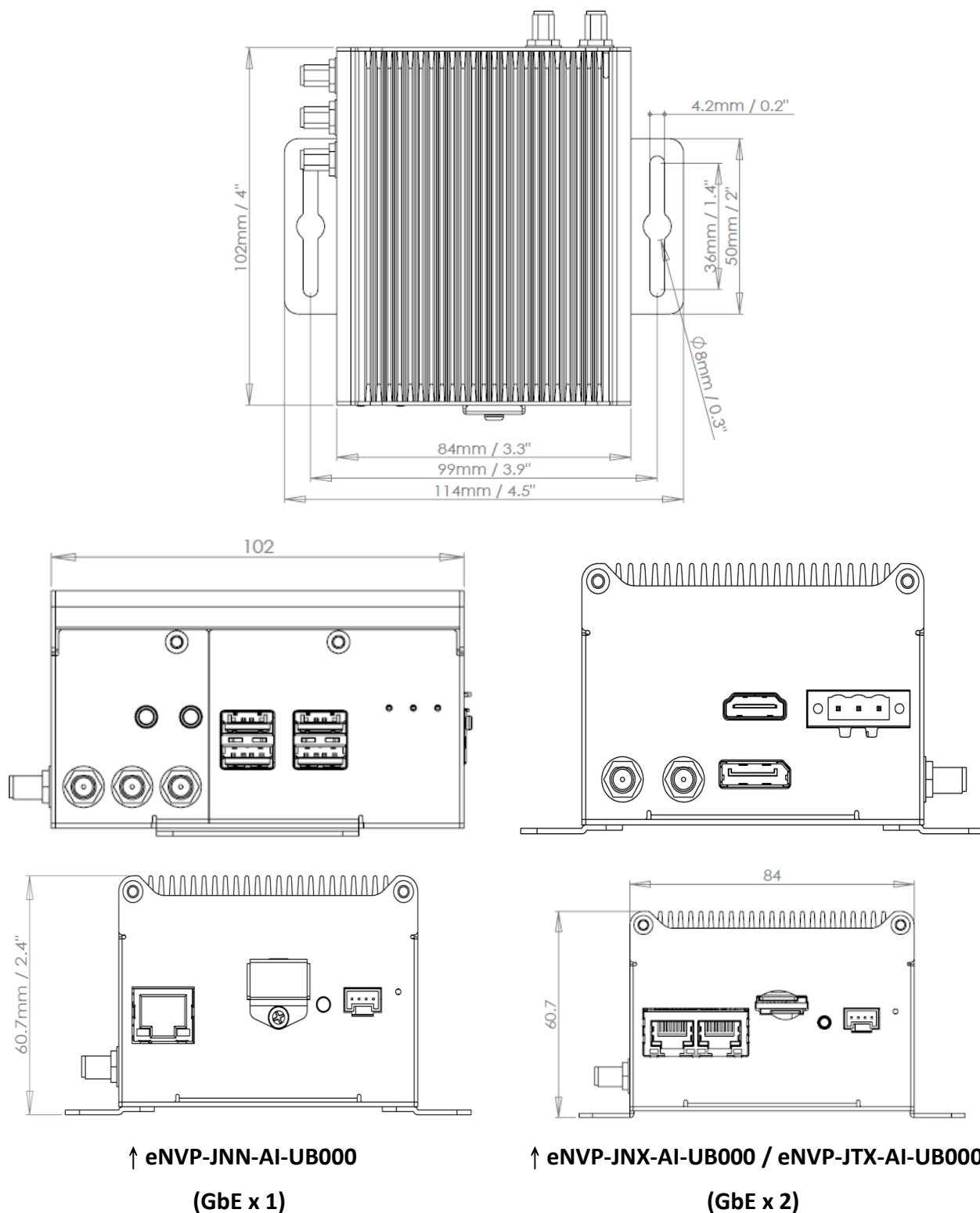
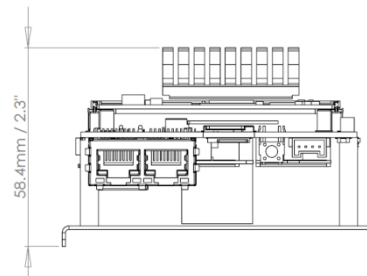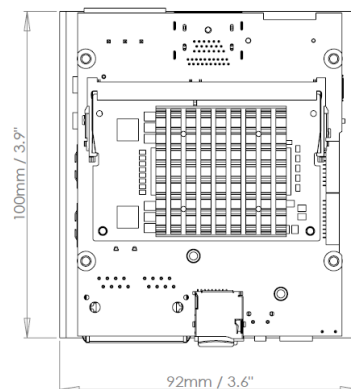## 1.2.2. UB Kit
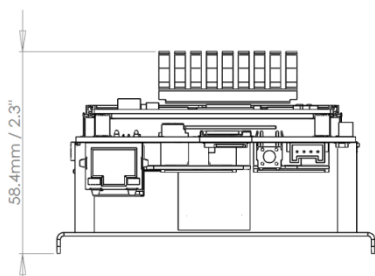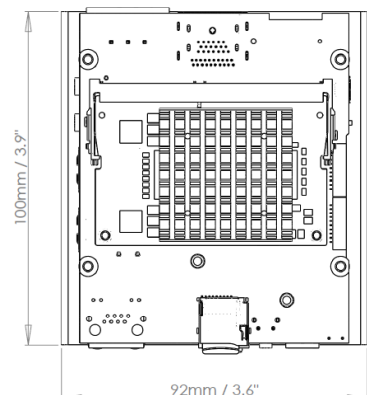
↑ UB Kit for Jetson® Nano   ↑ UB Kit for Jetson® Xavier NX   ↑ UB Kit for Jetson® TX2-NX

1.3   Packing List

UB Full Systems	UB Kit
• AI Box x 1 • 3-pin terminal block x 1	• UB Kit x 1 • EUA1200 USB Camera x 1 • 12V Power Adapter x 1 • Power Cable x 1 • MicroUSB to USB Cable x 1 • 10-pin I/O Cable x 4 • CAN bus Cable x 1 **UB Kit for Jetson® Xavier NX, TX2-NX will also be installed with M.2 M-key 2280 NVMe SSD 128G.

Note:
- Equipment configurations and supplied accessories vary by country. Please consult your local EverFocus office or agents for more information.
- Contact the shipper if any items appear to have been damaged in the shipping process. Please also keep the shipping carton for possible future use.

1.4   Optional Accessories

UB Full Systems Only	
3ENTR00DTH0001R	I/O Cable Kit
4B01XUD12060AS2	Adpater (In:100-240V / Out: DC12V 5A 60W)
3ENTR00DTH0004R	Fan Kit
4K02X00000030AR	Power Cord EU
4K02X00000020AR	Power Cord US
3ENTR00DTH0003R	LE910C4-EU M.2 B-KEY 3042 CAT4 4G Kit

1.5   Physical Description
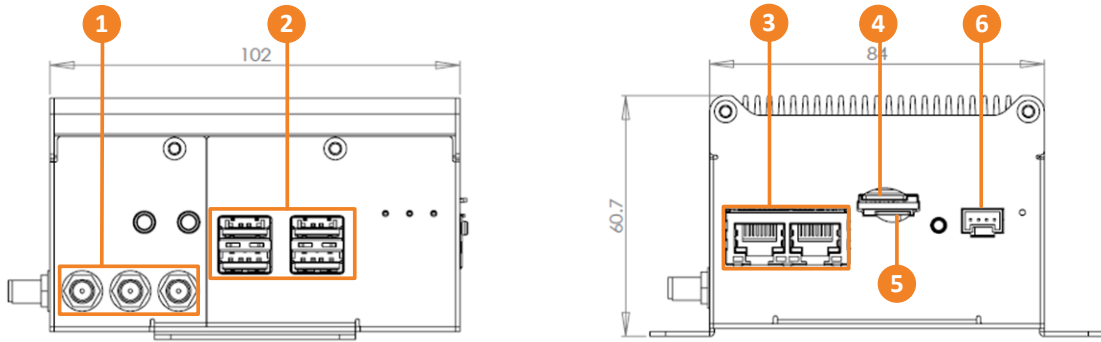
↑ **UB Full Systems**
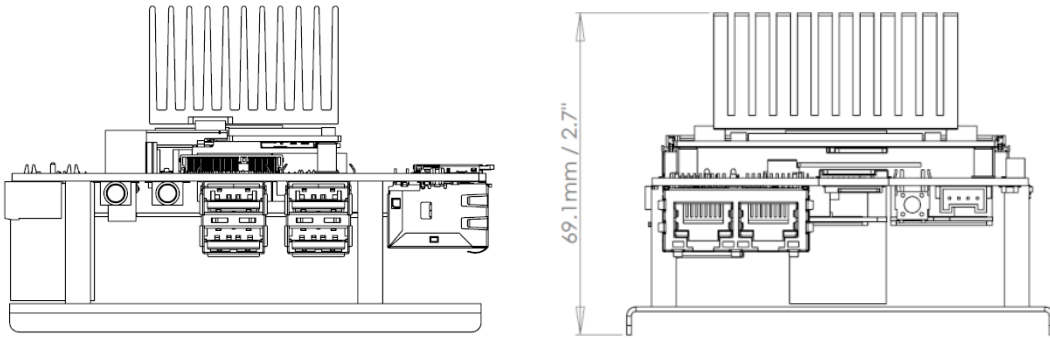
↑ **UB Kits**

No.	Name	Description
1	ANT	Antenna ports
2	USB	USB ports.
3	LAN	Ethernet ports
4	SD Card Slot	Insert SD card into the card slot
5	SIM Card Slot	Insert SIM card into the card slot
6	CAN bus	CAN bus port

1.6   Carrier Board

To access the carrier board from the UB full systems, please unscrew the 6 screws on the cover.

B key

M key

USB3*2   USB2.0   Audio In / Out

USB3.0

Power In +12 / Power GND

DisplayPort

HDMI

Power On Switch

SIM Card

Module RJ45   I210 RJ45

ACT LED

CANBUS
CAN BUS GND / CAN_L / CAN_H / CAN BUS 5V OUT

Micro SD Card

LINK LED
1000: Green on bright
100: Not bright

B Key
3.7V   Switch Power On

B Key   Automate
3.3V   Power On
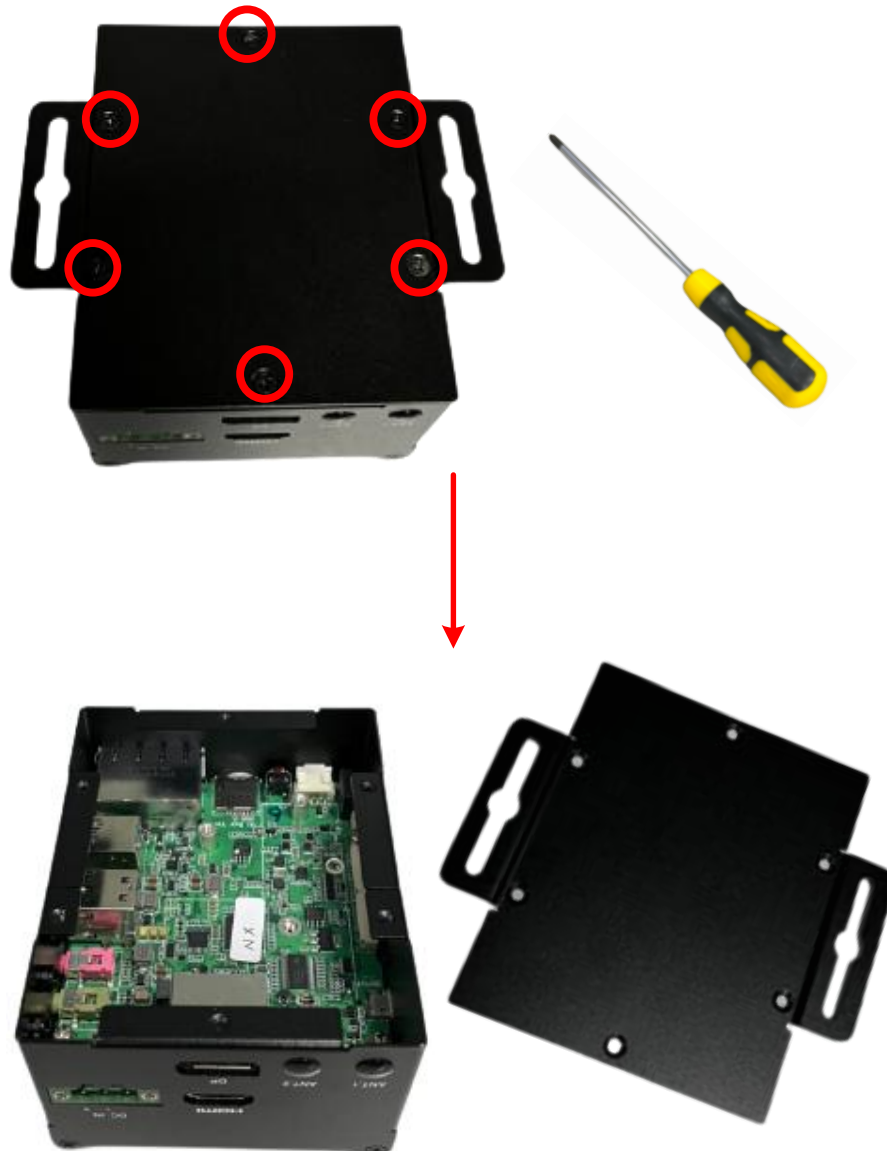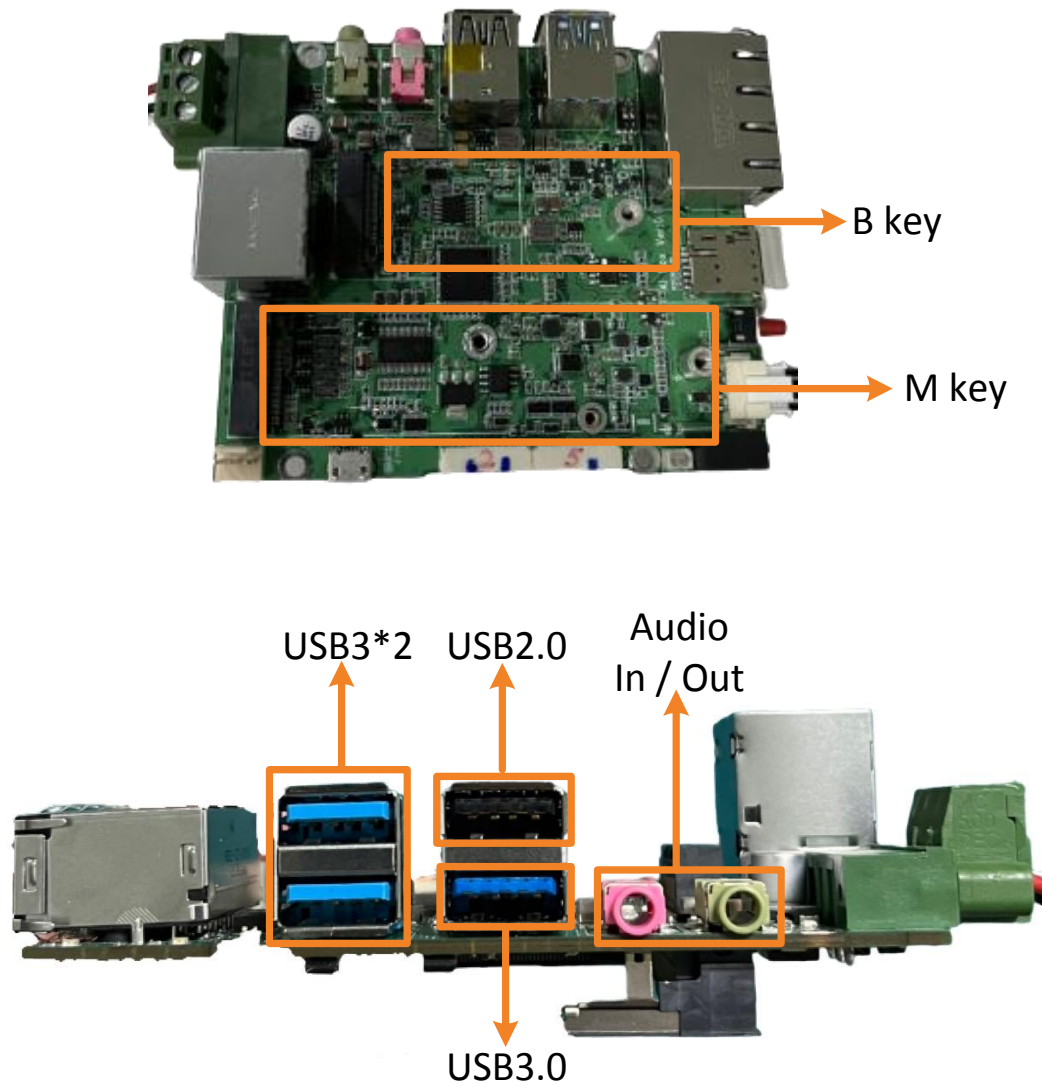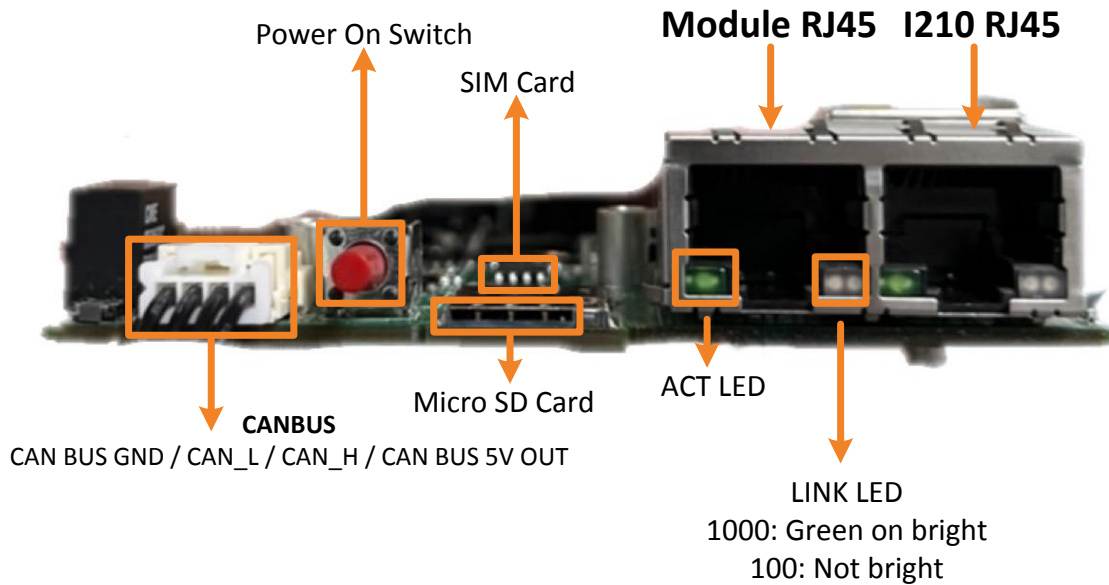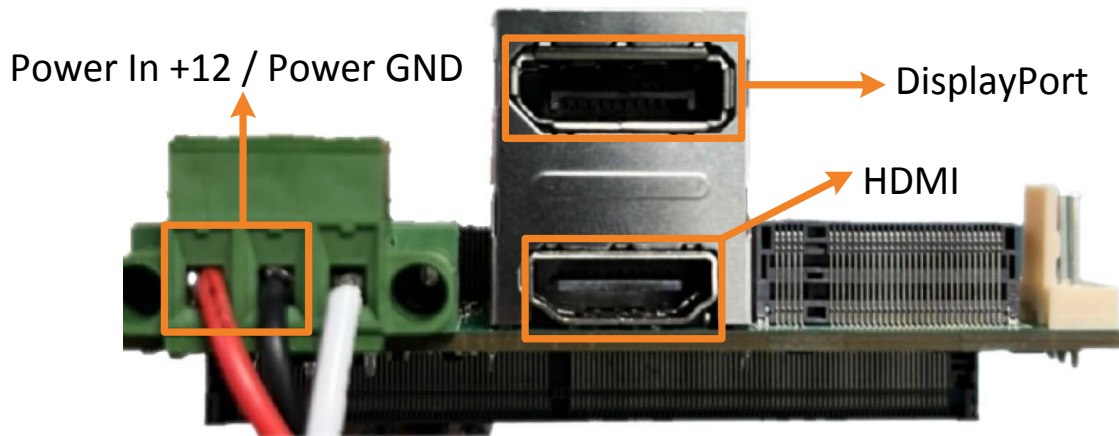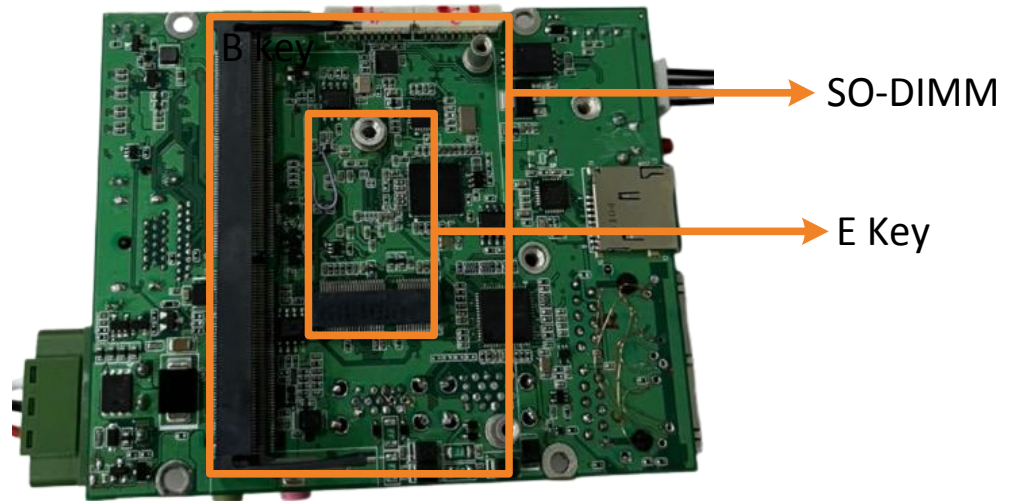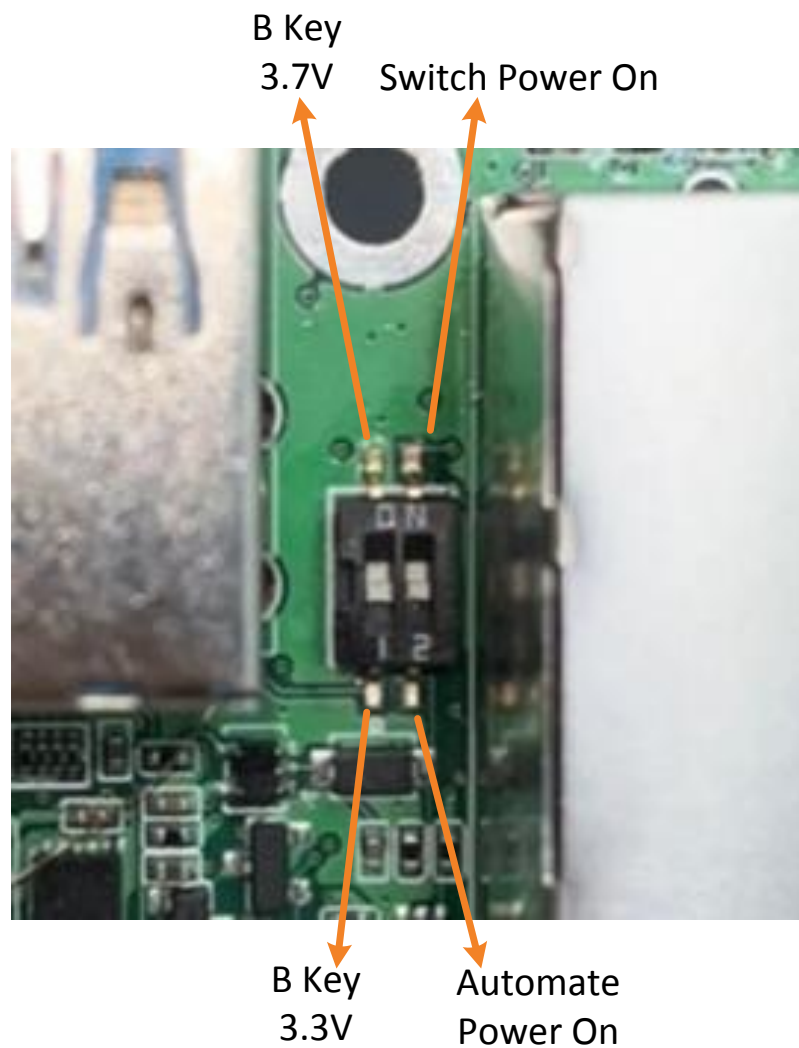
2. Jumpers and Connectors on the Motherboard

Users can use the jumpers and connectors to configure different applications.

Label	PIN	PIN Name	Function	Level
JP3	1	5V_OUT	5V 電壓輸出	
JP3	2	SPIO_MISO_LS	SPIO_MISO	3.3V
JP3	3	SPIO_CSO_LS	SPIO_CS0	3.3V
JP3	4	GND	GND	
JP3	5	SPI1_MISO_LS	SPI1_MISO	3.3V
JP3	6	SPI1_CS0_LS	SPI1_CS0	3.3V
JP3	7	UART1_TX_LS	UART1_TX	3.3V
JP3	8	GND	GND	
JP3	9	I2C0_SDA	I2C0_SDA	3.3V
JP3	10	I2C1_SCL	I2C1_SCL	3.3V

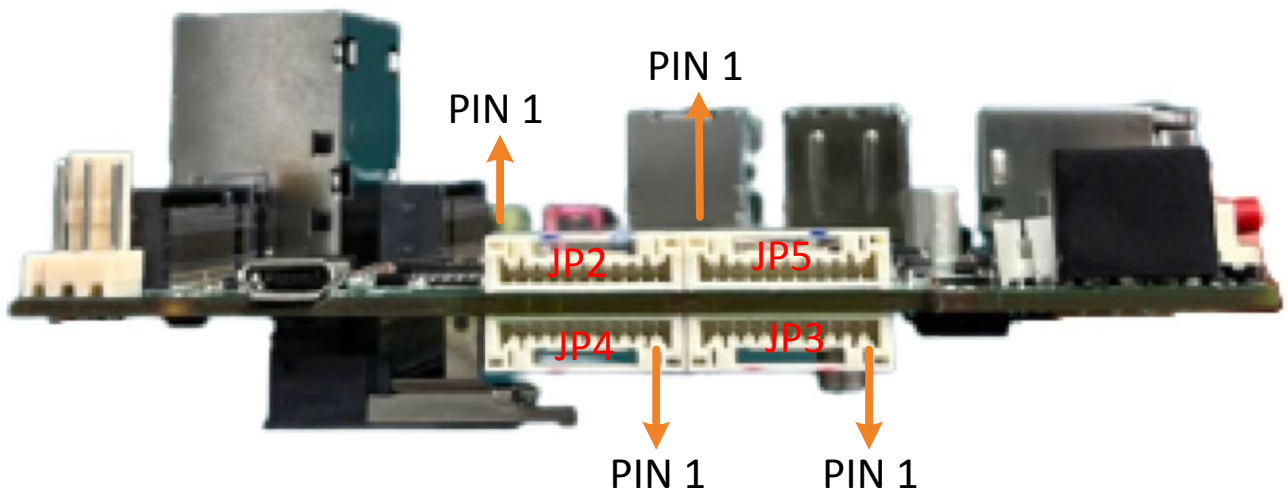| Label	PIN	PIN Name	Function	Level
JP4	1	GND	GND	
JP4	2	3V3_OUT	3.3V 電壓輸出	
JP4	3	UART2_TD_LS	UART2_TX	3.3V
JP4	4	NC	未接	
JP4	5	NC	未接	
JP4	6	485_A	RS485_A	
JP4	7	GPIO14_PWN	GPIO14/PWN	3.3V
JP4	8	GND	接GND	
JP4	9	GPIO11_LS	GPIO11	3.3V
JP4	10	GPIO01_LS	GPIO01	3.3V

Label	PIN	PIN Name	Function	Level
JP2	1	I2C1_SDA	I2C1_SDA	3.3V
JP2	2	GND	GND	
JP2	3	I2C0_SCL	I2C0_SCL	3.3V
JP2	4	UART1_RXD_LS	UART1_RX	3.3V
JP2	5	GND	GND	
JP2	6	SPI1_SCK_LS	SPI1_SCK	3.3V
JP2	7	SPI1_MOSI_LS	SPI1_MOSI	3.3V
JP2	8	3V3 OUT	3.3V 電壓輸出	
JP2	9	SPI_SCK_LS	SPI_SCK	3.3V
JP2	10	SPIO_MOSI_LS	SPIO_MOSI	3.3V

Label	PIN	PIN Name	Function	Level
JP5	1	GND	GND	
JP5	2	GPIO7_LS	GPIO7	3.3V
JP5	3	GPIO12_LS	GPIO12	3.3V
JP5	4	GPIO13_PWD_LS	GPIO13/PWN	3.3V
JP5	5	GND	GND	
JP5	6	485_B	RS485B	
JP5	7	NC	未接	
JP5	8	5V OUT	5V 電壓輸出	
JP5	9	UART2_RXD_LS	UART2_RX	3.3V
JP5	10	GND	GND	

Chapter

3

3. Specification

3.1 UB Full Systems & Kits

	eNVP-JNN-AI-UB000 & UB Kit for Jetson® Nano	eNVP-JNX-AI-UB000 & UB Kit for Jetson® Xavier NX	eNVP-JTX-AI-UB000 & UB Kit for Jetson® TX2 NX
AI Accelerator	NVIDIA® Jetson Nano™	NVIDIA® Jetson Xavier™ NX	NVIDIA® Jetson TX2 NX™
CPU	Quad-Core Arm® Cortex®-A57 MPCore processor	6-core NVIDIA Carmel Arm® v8.2 64-bit CPU	Dual-Core NVIDIA Denver 2 64-Bit CPU and Quad-Core Arm® Cortex®-A57 MPCore processor
GPU	128-core NVIDIA Maxwell™ GPU	384-core NVIDIA Volta™ GPU with 48 Tensor Cores	256-core NVIDIA Pascal™ GPU
Memory	Onboard 4 GB 64-bit LPDDR4	Onboard 8 GB 128-bit LPDDR4	Onboard 4 GB 128-bit LPDDR4
Ethernet	GbE x 1	GbE x 2	GbE x 2
Expansion	M.2 M-key 2280 x 1 M.2 B-key 3042/3052 x 1	M.2 M-key 2280 x 1 M.2 B-key 3042/3052 x 1 M.2 E-key 2230 x 1	M.2 M-key 2280 x 1 M.2 B-key 3042/3052 x 1 M.2 E-key 2230 x 1
Operating Temp.	-20℃ ~ 55℃	- 20℃ ~ 50℃ (w/ Fan)	-20℃ ~ 50℃
Storage	16 GB eMMC 5.1		
SD Card	MicroSD x 1		
NVMe SSD	Supported (via Expansion)		
Power Supply	DC 12V		
Antenna	ANT. x 5		
Wi-Fi / BT	Supported (via Expansion)		
4G / 5G	Supported (via Expansion)		
Button	Recovery x 1, Reset x 1		
Indicator	LED x 1 (PWR)		
Display	HDMI x 1, DisplayPort x 1		
Audio	Audio In/Out x 1		
USB	USB 3.0 x 3, USB 2.0 x 1		
OTG USB	MicroUSB x 1 (for Flash OS)		
Power	PWR Input x 1 (3-pin terminal block)		
CAN bus	CAN bus x 1		
Others	UART x 2, RS-485 x 1, I2C x 2, SPI x 2, GPIO x 6, +5V Output x 2, +3.3V Output x 2		
Dimensions	114 x 102 x 60.7 mm^3 (with bracket)		
Weight	0.65 kg		
Storage Temp.	-40℃ ~ 85℃		
Storage Humidity	10% ~ 90%, non-condensing		
Vibration	MIL-STD-810G, Method 514.7, Category 4 MIL-STD-810G, Method 516.7, Procedure I (Shock)		
Certification	CE/ FCC Class A (according to EN 55032/55035)		

3.2   UB Kit Accessory - EUA 1200 USB Camera

EUA 1200 USB Camera	
Pickup Device	1080p CMOS sensor
System Format	60Hz / 50Hz
Effective Pixels	1920 (H) x 1080 (V)
Scanning System	Progressive Scan
Sensitivity	23k e/lux.sec
Video Format	MJPEG / YUV2
Frame Rate	MJPEG: 1920x1080/30FPS;1280x720/30FPS;640x480/30FPS YUV2: 1920x1080/5FPS; 1280x720/8FPS；640x480/30FPS
Lens Type	3.6mm / 6mm fixed lens, F2.0
FOV (H x V x D)	3.6mm: 87.4° x 47° x 104° 6mm: 48° x 29° x 63°
Interface	USB 2.0 OTG
White Balance	Auto
Exposure	Auto
Focus Range	30CM -∞
S/N Ratio	38.6 dB
Power Source	5VDC
Operating Temp.	0°C ~ 50°C / 32°F ~ 122°F
Humidity	Less than 95%
Dimensions	35.8 x 35.8 x 20mm / 1.41" x 1.41" x 0.79" (without bracket and lens)
OS	Win7 / Win8 / Win10 / Win11 / Linux2.6 or Above (Linux requires driver)
Free Driver	USB Video Class (UVC)
Cable Length	1m / 3.28ft.
Weight	75g / 0.165lb
Certificates	CE, FCC, RoHS

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