EC3100

Ruggedized Embedded System
With NVIDIA® Jetson Orin™ NX/ Nano Module
for Edge AI

User Manual

Version 1.0
September 2025

iBASE

Compliance

CE

This product has passed CE tests for environmental specifications and limits. This product is in accordance with the directives of the European Union (EU). If users modify and/or install other devices in this equipment, the CE conformity declaration may no longer apply.

FC

This product has been tested and found to comply with the limits for a Class B 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.

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive for Waste Electrical and Electronic Equipment (WEEE – 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green IBASE

This product is compliant with the current RoHS 2 restrictions and prohibits use of the following substances in concentrations exceeding 0.1% by weight (1000 ppm) except for cadmium, limited to 0.01% by weight (100 ppm).

- Hexavalent chromium: 1,000 ppm
- Poly-brominated biphenyls (PBBs): 1,000 ppm
- Poly-brominated diphenyl ethers (PBDEs): 1,000 ppm
- Cadmium: 100 ppm
- Mercury: 1,000 ppm
- Lead: 1,000 ppm
- Bis(2-ethylhexyl) phthalate (DEHP): 1,000 ppm
- Butyl benzyl phthalate (BBP): 1,000 ppm
- Dibutyl phthalate (DBP): 1,000 ppm
- Diisobutyl phthalate (DIBP): 1,000 ppm

Important Safety Information

Carefully read the precautions before using the device.

Environmental conditions:

- Lay the device horizontally on a stable and solid surface in case the device may fall, causing serious damage.
- Leave plenty of space around the device and do not block the openings for ventilation. Never drop or insert any objects of any kind into the ventilation openings.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the device for ventilation. Never insert objects of any kind into the ventilation openings.

Care for your IBASE products:

- Before cleaning the device, turn it off and unplug all cables such as power in case a small amount of electrical current may still flow.
- Use neutral cleaning agents or diluted alcohol to clean the device chassis with a cloth. Then wipe the chassis with a dry cloth.
- Vacuum the dust with a computer vacuum cleaner to prevent the air vent or slots from being clogged.

WARNING

Attention during use:

- Do not use this product near water.
- Do not spill water or any other liquids on your device.
- Do not place heavy objects on the top of the device.
- Operate this device from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your distributor or local power company.
- Do not walk on the power cord or allow anything to rest on it.
- If you use an extension cord, make sure that the total ampere rating of the product plugged into the extension cord does not exceed its limits.

Avoid Disassembly

You are not suggested to disassemble, repair or make any modification to the device. Disassembly, modification, or any attempt at repair could generate hazards and cause damage to the device, even bodily injury or property damage, and will void any warranty.

CAUTION

Danger of explosion if the internal lithium-ion battery is replaced with an incorrect type. Replace only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Warranty Policy

- **IBASE standard products:**

  24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **3rd-party parts:**

  12-month (1-year) warranty from delivery for the 3rd-party parts that are not manufactured by IBASE, such as CPU, memory, SSD/HDD, power adapter, panel and touchscreen.

* *Products that fail due to misuse, accident, improper installation or unauthorized repair shall be treated as out of warranty and customers shall be billed for repair and shipping charges.*

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest information about the product.
2. If you need any further assistance from your distributor or sales representative, prepare the following information of your product and elaborate upon the problem.
   - Product model name
   - Product serial number
   - Detailed description of the problem
   - The error messages in text or in screenshots if there is any
   - The arrangement of the peripherals
   - Software in use (such as OS and application software, including the version numbers)
3. If repair service is required, you can download the RMA form at the website of IBASE. Fill out the form and contact your distributor or sales representative.

iBASE

Table of Contents

Chapter 1
General Information

The information provided in this chapter includes:

- Introduction
- Features
- Packing List
- Specifications
- Product View
- Dimensions

1.1 Introduction

EC3100 system provides access to a wide range of interface supported by NVIDIA Jetson Orin™ NX and Orin™ Nano modules, Jetson Orin™ NX series modules deliver up to 157 TOPS, Orin™ Nano series modules deliver up to 67 TOPS of AI performance with power configurable between 25W and 45W.

It features HDMI video output, two USB 3.2 ports, one RJ-45 GbE port for system use, one optional RJ-45 GbE port for out-of-band (OOB) management, and one optional RJ-45 GbE port with Power over Ethernet (PoE) support. Additional interfaces include a 20-pin expansion header and a USB 2.0 Type-C port for system recovery.

For wireless and cellular connectivity, the system supports an M.2 B-Key 3052 slot for 4G/5G modules and an M.2 E-Key 2230 slot for Wi-Fi. Powered by the NVIDIA® Jetson Orin™ NX and Orin™ Nano modules, and combined with its rich I/O functionality, the Jetson-based system is an ideal platform for compact, high-performance edge AI computing, particularly in intelligent video analytics applications.

1.2 Features

- Supports NVIDIA® Jetson Orin™ NX and Orin™ Nano modules for scalable AI performance
- Gigabit Ethernet (1 x GbE RJ-45) for high-speed networking
- Gigabit Ethernet (1 x GbE RJ-45) With OOB management functions
- HDMI Display Output:
  - 4K@60Hz via HDMI 2.1 (Orin™ NX)
  - 4K@30Hz via HDMI 1.4 (Orin™ NX/Nano)
- Versatile USB I/O:
  - 2 x USB 3.2 Gen2 (Type-A)
  - 1 x USB 2.0 Type C (support recovery)
- M.2 Expansion Slots:
  - 1 x M.2 3042 B-Key for OOB 4G modules
  - 1 x M.2 2230 E-Key for Wi-Fi/BT modules
  - 1 x M.2 3052 B -Key for 4G/5G modules
- Wide-range DC power input: 12V–24V, 5A (via DC jack or ATX 4-pin)
- Optional power cord types: US, JP, EU, UK, TW, AU, CN
- Integrated thermal solution: Passive heatsink
- Built-in RTC battery with MCU-based battery life monitoring
- Compact and lightweight: 220mm x 174mm x 80mm, 3.0 kg
- Reliable operation in harsh environments: -25°C~50°C
- Certified for global markets: CE, FCC

1.3 Packing List

Your product package should include the items listed below.

•NVIDIA® Jetson Orin™ NX and Orin™ Nano modules

•Carrier board

•Power Adaptor

•Power Cord

•Cable Bracket

The user’s manual can be downloaded from the IBASE website.

1.4 Specifications

Product Name	EC3100
System Motherboard	NVIDIA® Jetson Orin™ NX and Orin™ Nano modules
System	
Operating System	Ubuntu 20.04 Jetpack 6.2
CPU Type	NVIDIA® Jetson Orin™ NX 16GB: 8-core Arm® Cortex® -A78AE v8.2 64-bit CPU 2MB L2 + 4MB L3 NVIDIA® Jetson Orin™ NX 8GB: 6-core Arm® Cortex® -A78AE v8.2 64-bit CPU 1.5MB L2 + 4MB L3 NVIDIA® Jetson Orin™ NX 8GB/4GB: 6-core Arm® Cortex® -A78AE v8.2 64- bit CPU 1.5MB L2 + 4MB L3
Memory	NVIDIA® Jetson Orin™ NX: 16GB 128-bit LPDDR5 102.4 GB/s NVIDIA® Jetson Orin™ NX: 8GB 128-bit LPDDR5 102.4 GB/s NVIDIA® Jetson Orin™ Nano: 8GB 128-bit LPDDR5 68 GB/s NVIDIA® Jetson Orin™ Nano: 4GB 128-bit LPDDR5 34 GB/s
Storage	1 x M.2 2280 M-Key NVMe (default 128GB)
Display	4K@60Hz via HDMI 2.1 (Orin™ NX) 4K@30Hz via HDMI 1.4 (Orin™ NX/Nano)
Network	1 x Gb LAN (Intel I210 With OOB management functions) 1 x Gb LAN (NVIDIA Jetson Orin NX or Nano module)
Power Supply	1 x DC-in +9V~+36V (+-5%) / Lockable power connector
I/O Ports	
Display	1 x HDMI2.0a (up to 4K resolution)
LAN	2 x RJ45 GbE LAN 1 x RJ45 GbE LAN (optional OOB management functions)
PoE	1 optional IDA-8104 module enabled 4 ports Gigabit Ethernet POE
GMSL	1 optional NJD-100 module enabled 4 ports 4 x GMSL cameras

Product Name	EC3100
I/O Interface	2 x USB 3.2 Gen1 Type-A 1 x USB 3.2 Gen2 Type-C 1 x USB 2.0 Type-C (OTG) 1 x DB9 for RS232 COM port 1 x DB9 for CANBus 1 x Line-out 1 x Mic-in 1 x 9V-36V Lockable power connector
Expansion Slots	1 x M.2 3052 B-key (Optional 4G/5G module) 1 x M.2 2230 E-Key (Optional WiFi/BT module) 1 x M.2 3042 B-Key (Optional OOB 4G module) 1 x M.2 2280 M-Key NVMe1 x SIM Card Slot 1 x SIM socket for 4G/5G 1 x SIM socket for OOB 3G/4G
MISC. Function	1 x Recovery button 1 x Reset button 1 x Power button
Auto Control and Monitoring	Watchdog Timer: Yes (256 segments, 0, 1, 2…128 secs)
Power Requirement	9~36V DC
Weight	3.0 kg (6.61 lbs)
Chassis Color	Black and Red
Power Supply	Power Supply 160W power adaptor
Construction	SGCC
Dimensions (W x H x D)	220mm (W) x 174mm (D) x 80mm (H)5
Environment	
Temperature	Operating: -20°C~50°C (-4°F~122°F) Storage: -40°C~80°C (-40°F~176°F)
Relative Humidity	10 ~ 90% at 45 °C (non-condensing)
Vibration Protection	SSD: random operation 5 grms, 5~500 Hz
Others	
ROHS	Yes
Certification	CE, FCC Class B

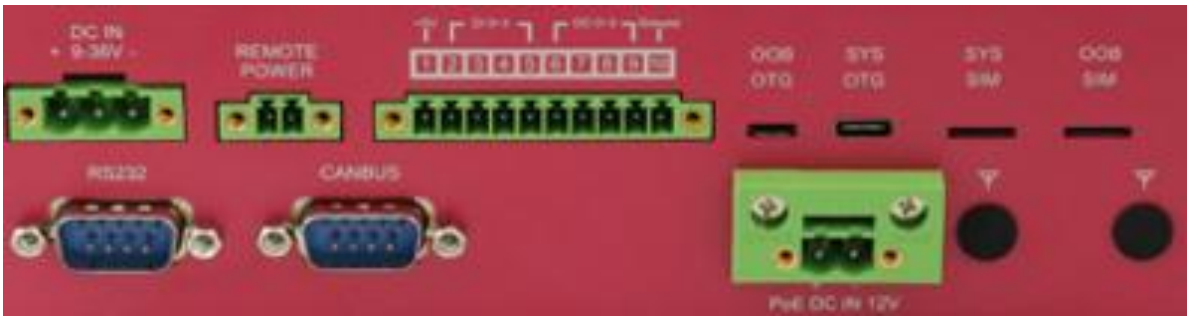
All specifications are subject to change without prior notice.

1.5 Product View

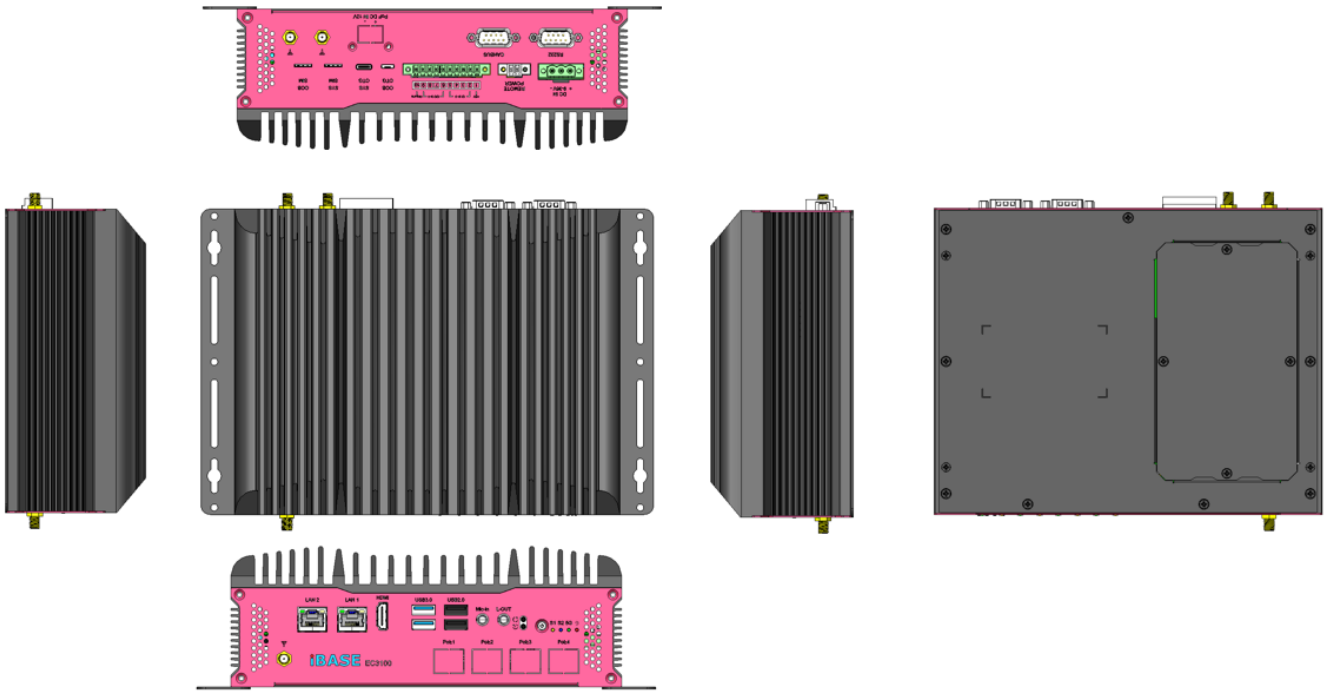
Front View

Rear View


DC IN
+ 9-36V -
REMOTE
POWER
OOB
OTG
SYS
OTG
SYS
SIM
OOB
SIM
RS232
CANBUS
PoE DC IN 12V


DC IN
+ 9-36V -
REMOTE
POWER
OOB
OTG
SYS
OTG
SYS
SIM
OOB
SIM
RS232
CANBUS
PoE DC IN 12V

1.6 Dimensions



220 mm (L) x 174 mm (W) x 80 mm (H)

Chapter 2
Hardware Configuration

The information provided in this chapter includes:

- installations
- Information and locations of connectors

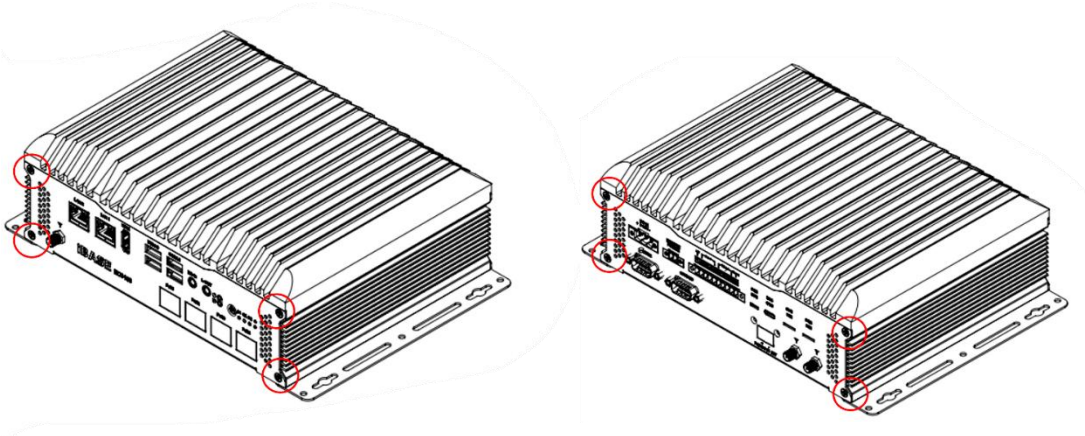
2.1 Installations

There are several connectors, sockets and switches on the motherboard in the system. To be able to access them, remove the screws on top of the system and the two screws on the same side as with the USB and LAN connectors. Below is a list of these connectors:

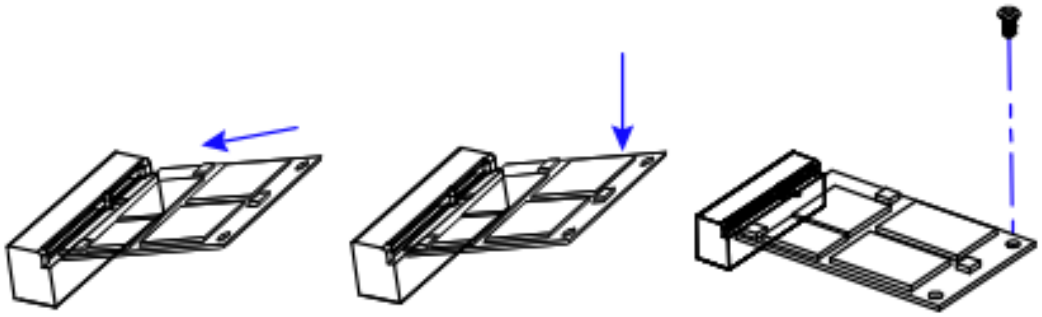
Function	Connector
M.2 M-key NVME(2280)	SSD1
Nvidia Jetson Orin NX/Nano Module	J1
Battery connector	J2
M.2 B-key OOB 3G/4G module	J4
Audio Connector	J5
Extension POE module	J9
M.2 B-key 4G/5G module (3052)	J11
M.2 E-key Wi-Fi (2230)	J14
GMSL module power	J16

2.1.1 M.2 Cards and Modules Installation

Locate the memory slot and align the notch on the memory module with the key on the slot. Before installing the M.2, wireless, SIM card or any other module into the device, loosen the 8 screws as shown below to remove the device cover.



To install the M.2 card on the board, remove the device cover, locate the slot and align the keys of the card with those of the interface in a way similar to the images below and fix the card onto the brass standoff with a screw.

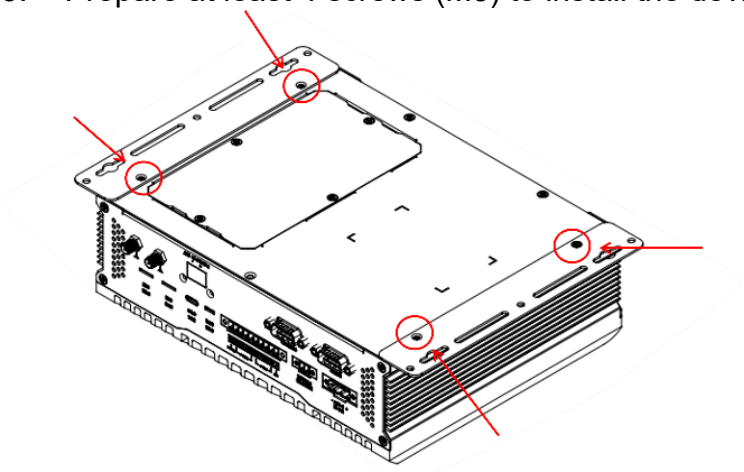


2.1.2 Mounting Installation

Before mounting the system, ensure that you have enough room for the power adaptor and signal cable routing, and have good ventilation for the power adaptor. The method of mounting must be able to support weight of the device plus the weight of the suspending cables attached to the system. Use the following methods for mounting the device:

Wall Mounting Installation

1. Turn the device upside down.
2. Attach the wall-mount kit to the device using the supplied 4 screws.
3. Prepare at least 4 screws (M3) to install the device on the wall.



2.2 Connectors Quick Reference

Connector	Function	Connector	Function
BTN1	Power on/off Button	FAN2	System FAN2
BTN2	Reset and Recovery Button	LAN1	GIGA LAN
CN1	HDMI	LAN2	I210 LAN with OOB
CN2	USB-A 2.0	USB1	USB-micro OOB/upload
CN3	USB-A 3.0	USBC1	USB-C OTG/recovery
CN5	Audio LINE out	J12	4DI/4DO
CN7	External power on/off	J13	DC-IN power input
CN8	Nano SIM	JP1	I210 firmware upload
CN9	Audio MIC in	JP2	NUC980 OOB debug
CN10	Nano SIM(OOB)	SW1	Auto power (AT/ATX)
COM1	RS-232 /Console	SW2	OOB boot select
CAN1	CAN connecter	SW4	OOB use
FAN1	System FAN1	SW5	UART1/console select

2.2.1 Power on/off Button

Item	Description
Location	BTN1
Type	Power on by push button
Function	Power button input/ push button hold over 10sec to force power off

2.2.2 Reset and Recovery

Item	Description
Location	BTN2
Type	Reset and Recovery Button
function	To trigger system reset action
	Press to force recovery mode

2.2.3 HDMI Connector

Item	Description
Location	CN1
Type	HDMI Connector

Pin	Signal	Pin	Signal
1	HDMI_D2+	11	USB_+5V
2	GND	12	USB1_DN
3	HDMI_D2-	13	USB1_DP
4	HDMI_D1+	14	GND
5	GND	15	HDMI_SCL
6	HDMI_D1-	16	HDMI_SDA
7	HDMI_D0+	17	GND
8	GND	18	HDMI_5V
9	HDMI_D0-	19	HPD
10	HDMI_CLK+	20	

2.2.4 USB 2.0 Type-A Connector

Item	Description
Location	CN2
Type	Dual USB TYPE-A 2.0 connector

Pin	Signal	Pin	Signal
1	USB_+5V	5	USB_+5V
2	USB0_DN	6	USB1_DN
3	USB0_DP	7	USB1_DP
4	GND	8	GND

2.2.5 USB 3.0 Gen 2 Type-A Connector

Item	Description
Location	CN3
Type	Dual USB TYPE-A 3.0 connector

Pin	Signal	Pin	Signal
10	USB3.0_VBUS	1	USB3.0_VBUS
11	USB3.0_DM1	2	USB3.0_DM0
12	USB3.0_DP1	3	USB3.0_DP0-
13	GND	4	GND
14	USB3.0_SSRX1-	5	USB3.0_SSRX0+
15	USB3.0_SSRX1+	6	USB3.0_SSRX0-
16	GND	7	GND
17	USB3.0_SSTX1-	8	USB3.0_SSTX0-
18	USB3.0_SSTX1-	9	USB3.0_SSTX0+

2.2.6 Audio Line-Out

Item	Description
Location	CN5
Type	Audio Line out Port

Pin	Signal	Pin	Signal
1	GND	2	L-OUT
3	NC	4	R-OUT
5	NC		

2.2.7 External Power On/Off

Item	Description
Location	CN7
Type	Pluggable terminal block, Phoenix type
Notes: Ensure proper mating with Phoenix plug	

Pin	Signal	Pin	Signal
1	PWR_BTN	2	GND

2.2.8 SYS Nano SIM

Item	Description
Location	CN8
Type	Nano SIM (3FF) port
Notes: For LTE/4G/5G module only	

Pin	Signal	Pin	Signal
C1	UIM_VCC	C2	UIM_RST
C3	UIM_CLK	C5	GND
C6	UIM_VPP	C7	UIM_DATA
CD	UIM_CD		

2.2.9 Audio MIC-in Port

Item	Description
Location	CN9
Type	3.5mm audio jack for microphone input
Notes: On board MIC header	

Pin	Signal	Pin	Signal
1	GND	2	MIC-L
3	MIC_DET	4	MIC-R
5	NC		

2.2.10 OOB Nano SIM

Item	Description
Location	CN10
Type	Nano SIM (3FF) port
Notes: For OOB 4G module only	

Pin	Signal	Pin	Signal
C1	UIM_VCC	C2	UIM_RST
C3	UIM_CLK	C5	GND
C6	UIM_VPP	C7	UIM_DATA
CD	UIM_CD		

2.2.11 RS-232 COM Port

Item	Description
Location	COM1
Type	RS-232
Notes: UART1/Console select by SW5	

Pin	Signal	Pin	Signal
1	DCD	2	RX
3	TX	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

2.2.12 CAN Connector

Item	Description
Location	CAN1
Type	Standard DB9 connector
Notes: Supports CAN 2.0A/ 2.0B Protocol	

Pin	Signal	Pin	Signal
1	NC	2	CANL
3	GND	4	NC
5	NC	6	GND
7	CANH	8	NC
9	CAN-12V	10	NC

2.2.13 Gigabit LAN

Item	Description
Location	LAN1
Type	RJ45 Gigabit Ethernet port
Notes: Supports auto MDI/MDI-X	

Pin	Signal	Pin	Signal
1	GND	2	MDI3-
3	MDI3+	4	MDI1-
5	MDI2-	6	MDI2+
7	MDI1+	8	MDI0-
9	MDI0+	10	CT

2.2.14 I210 LAN with OOB

Item	Description
Location	LAN2
Type	RJ45 Gigabit Ethernet port
Notes: Supports auto MDI/MDI-X	

Pin	Signal	Pin	Signal
1	GND	2	MDI3-
3	MDI3+	4	MDI1-
5	MDI2-	6	MDI2+
7	MDI1+	8	MDI0-
9	MDI0+	10	CT

2.2.15 USB-micro OOB/Upload

Item	Description
Location	OOB OTG
Type	USB 2.0 Micro-B connector
Note: Supports USB2.0 high-speed(480mbps) communication	

Pin	Signal	Pin	Signal
1	NC	2	USB_OOB_DM
3	USB_OOB_DP	4	USB_OOB_ID
5	GND		

2.2.16 USB-C OTG/Recovery

Item	Description
Location	USBC1
Type	USB Type C connector
Notes: Supports system recovery	

Pin	Signal	Pin	Signal
A1	GND	B1	GND
A2	NC	B2	
A3	NC	B3	
A4	VBUS	B4	VBUS
A5	CC1	B5	CC2
A6	DP1	B6	DP1
A7	DN1	B7	DN1
A8		B8	
A9	VBUS	B9	VBUS
A10		B10	
A11		B11	
A12	GND	B12	GND

2.2.17 4DI/4DO

Item	Description
Location	J12
Type	8-pin pluggable terminal block
Notes: For 4 input and 4 output	

Pin	Signal	Pin	Signal
1	DIO_5V	2	DI0
3	DI1	4	DI2
5	DI3	6	DO0
7	DO1	8	DO2
9	DO3	10	DIO_GND

2.2.18 DC Power Input

Item	Description
Location	J13
Type	Pluggable terminal block, Phoenix type
Notes: Ensure proper mating with Phoenix plug	

Pin	Signal	Pin	Signal
1	DC_VIN	2	A_GND
3	DC_GND		

Chapter 3
Software Setup

This chapter introduces the following setup on the device: (for advanced users only)

- Software/BSP Installation
- Recovery Mode
- Initial Setup

3.1 Software/BSP Installation

Note: This is for advanced users with the IBASE standard image file only.

IBASE NVIDIA Jetson products have built-in BSP so the users don't have to install it after getting the products. Since we develop our own BSP, the users may need to follow the BSP installation SOP to re-install/upgrade/downgrade the BSP. Please visit the IBASE website or contact with IBASE FAE for installation guides, BSPs and technical tips.This section describes the installation procedures for software drivers. The drivers can be downloaded from the IBASE website.

3.2 Recovery Mode

The OTG Type-C port of EC3100 can be connected to another host device (Linux PC running NVIDIA JetpackTM) to run recovery process for re-flashing BSP.

Note: Please backup user personal files before flashing process Connect the OTG Type-C port to another host device which supplying updated BSP file.

Press and hold the Reset button, then press and hold the Recovery button continually.

After one second (1 sec.) release the Reset button first, then release the Recovery button.

The Orin/Orin nano will show up as a new NVIDIA device on USB list (Terminal console) at the host device.

Running re-flashing BSP process can be executed by the host device now.

3.3 Initial Setup

The OTG Type-C port of EC3100 can be connected to another host device (Linux PC running NVIDIA JetpackTM) to run recovery process for re-flashing BSP.

Before using IBASE NVIDIA product series, please follow the steps below to have initial setup.

3.3.1 Prepare the materials

Please prepare the materials list below

- A monitor with HDMI and respective cables
- USB keyboard and mouse
- Ethernet cable

3.3.2 Hardware connection

For the initial setup, users will need to connect LAN port, keyboard and mouse via USB interface, HDMI interface, and power connector.

3.3.3 Setup details

Step 1: Connect to the monitor while powering off Step 2: Power on and automatically enter the OS Step 3: Log in to the Ubuntu OS via credentials below

- Username: nvidia
- Password: nvidia

For more information on how to use Ubuntu and NVIDIA Jetson modules, please visit Ubuntu and NVIDIA website.