EdgeAI-ORN

Owner's Manual

Safety instructions

Use the following safety guidelines to help protect your computer from potential damage and to help ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that you have read the safety information that was shipped with your computer.

WARNING: Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source

CAUTION: Some repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by C-Lab, is not covered by your warranty. Read and follow the safety instructions that came with the product

CAUTION: To avoid electrostatic discharge and prevent damage to internal components from electrostatic discharge, when touching the computer or its parts, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface, such as a connector on the back of the computer.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned

CAUTION: This equipment is not suitable for use in locations where children are likely to be present.

Consignes de sécurité

Utilisez les consignes de sécurité suivantes pour protéger votre ordinateur contre les dommages potentiels et pour garantir votre sécurité personnelle. Sauf indication contraire, chaque procédure incluse dans ce document suppose que vous avez lu les consignes de sécurité fournies avec votre ordinateur.

AVERTISSEMENT: Débranchez toutes les sources d'alimentation avant d'ouvrir le capot ou les panneaux de l'ordinateur. Une fois que vous avez fini de travailler à l'intérieur de l'ordinateur, remettez en place tous les capots, panneaux et vis avant de vous connecter à la source d'alimentation

PRÉCAUTION: Certaines réparations ne peuvent être effectuées que par un technicien de maintenance agréé. Vous ne devez effectuer le dépannage et les réparations simples que comme autorisé dans la documentation de votre produit ou comme indiqué par l'équipe de service et d'assistance en ligne ou par téléphone. Les dommages dus à une intervention non autorisée par C-Lab ne sont pas couverts par votre garantie; lisez et respectez les consignes de sécurité fournies avec le produit.

PRÉCAUTION: Pour éviter les décharges électrostatiques et les dommages aux composants internes qu'elles peuvent provoquer, lorsque vous touchez l'ordinateur ou ses composants, mettez-vous à la terre à l'aide d'un bracelet antistatique ou en touchant périodiquement une surface métallique non peinte, telle qu'un connecteur à l'arrière de l'ordinateur.

PRÉCAUTIONManipulez les composants et les cartes avec précaution. Ne touchez pas les composants ou les contacts d'une carte. Tenez une carte par ses bords ou par son support de montage métallique. Tenez un composant, tel qu'un processeur, par ses bords et non par ses broches

PRÉCAUTION: Lorsque vous déconnectez un câble, tirez sur son connecteur ou sur sa languette, et non sur le câble lui-même.
Certains câbles sont équipés de connecteurs avec des languettes de verrouillage; pour ce type de câble, appuyez sur les languettes avant de le déconnecter.
Lorsque vous séparez les connecteurs, maintenez-les bien alignés afin d'éviter de plier les broches.
Enfin, avant de connecter un câble, assurez-vous que les deux connecteurs sont correctement orientés et alignés.

PRÉCAUTION: Cet équipement n'est pas destiné à être utilisé dans des environnements où des enfants sont susceptibles d'être présents.

Revision 1.0
07-Sep-2025

Table of Contents

For more information, please visit: https://edge.compulab.com/products/EdgeAI-ORN/
For technical support and product related questions, please email: edgesupport@compulab.co.il

For the latest version of this document:
https://cdn.edge.compulab.com/EdgeAI-ORN/documents/EdgeAI-ORN-owners-manual.pdf

Introduction

Thank you for purchasing EdgeAI-ORN. A fanless PC based on NVIDIA Jetson Orin module, designed to be tough, capable, versatile and user-friendly. With proper installation, we expect EdgeAI-ORN to serve you for many years. The unique design of EdgeAI-ORN eliminates the need for any maintenance after installation. Please consult this owner's manual for getting started with EdgeAI-ORN. You are welcome to contact the EdgeAI-ORN manufacturer, C-Lab, at edge.compulab.com or edgesupport@compulab.co.il should you have any technical questions.

Features

- NVIDIA® Jetson Orin™ NX/Nano
- MIL-STD-810G
- RS-232/RS-485 + CAN + GPIOs
- 4x USB 3.2 for camera input
- 4x PoE 2.5GbE optional camera input
- 4x GMSL2 optional camera input
- 4x FPD Link IV optional camera input
- Optional Out-Of-Band management
- 9V – 36V DC power input

Package contents

1. Built-to-order or barebone EdgeAI-ORN computer
2. Power supply: Power supply: input 100-240V AC 50/60Hz, output 9V – 36V DC
3. Antennas, according to configuration
4. Serial plug
5. Owner's manual

Notes

- Additional accessories can be purchased separately here:

  https://edge.compulab.com/store-product-category/parts-and-accessories/edgeai-orn-accessories/

- Some EdgeAI-ORN configurations come pre-installed with additional devices and accessories

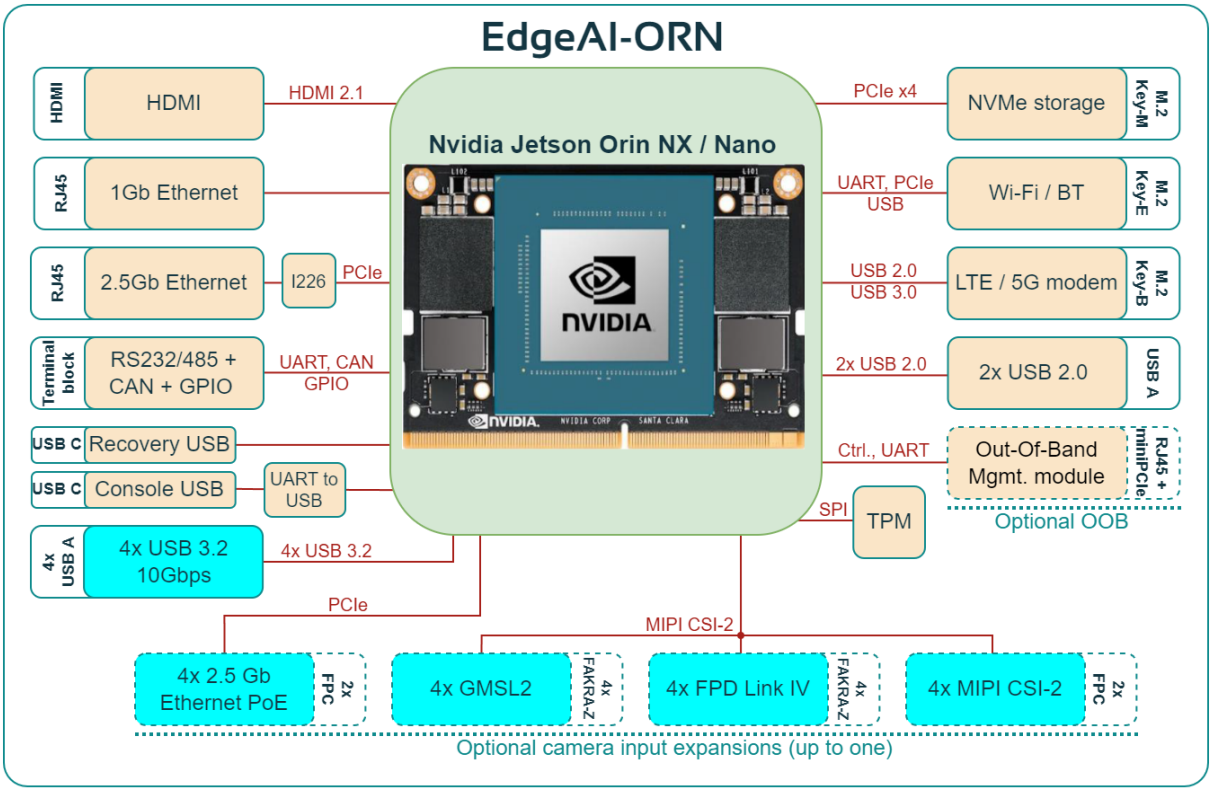
Specifications

Computation module	Jetson Orin™ NX 16GB	Up to 157 TOPS | 16GB LPDDR5 | 10W / 15W / 25W / 40W
	Jetson Orin™ NX 8GB	Up to 117 TOPS | 8GB LPDDR5 | 10W / 15W / 25W / 40W
	Jetson Orin™ Nano 8GB	Up to 67 TOPS | 8GB LPDDR5 | 7W / 15W / 25W
	Jetson Orin™ Nano 4GB	Up to 34 TOPS | 4GB LPDDR5 | 7W / 10W / 25W
Storage	M.2 Key-M	PCIe Gen. 4[1] x4, size up to 2280 for NVMe
Serial/GPIO	Serial port	Isolated RS-232/422/485 on terminal block
	CAN bus	Isolated CAN bus on terminal block
	GPIO	2x GPI + 2x GPO
Display	HDMI	HDMI 2.1, up to 8K @ 30Hz
Wireless Connectivity	M.2 Key-E	For Wi-Fi/BT M.2 2230 module
	M.2 Key-B	For M.2 LTE/5G modem
Ethernet, standard	1x 2.5 GbE	2.5Gbps Ethernet from Intel® i226 on RJ45
	1x 1 GbE	1 Gbps Ethernet from Jetson module on RJ45
USB	USB 2.0	2x USB 2.0 on Type-A
	USB 3.2	4x USB 3.2 10Gbps (20Gbps in total)
PoE input expansion	4x 2.5 GbE	4x 2.5Gbps PoE Ethernet from Intel® i226 on RJ45
	PoE power capability	4x 15.4W PoE power delivery[2]
SerDes GMSL2 input expansion	4x GMSL2	4x GMSL2 deserializer input on FAKRA Z
	PoC power capability	4x Power over Coax, 12V up to 1A
SerDes FPD Link IV input expansion	4x FPD Link IV	4x FPD Link IV deserializer input on FAKRA Z
	PoC power capability	4x Power over Coax, 12V up to 1A
MIPI-CSI input expansion	4x MIPI-CSI	4-lane MIPI-CSI, 2.5Gbps per pair, on 2 FFC connectors
	Pin-out	2x 22-position, Jetson Orin standard pin-out
TPM	TPM 2.0	TPM 2.0, SLB9670
Optional OOB	Out-of-band module	Optional Allxon Bolt OOB enabler w/ dedicated Ethernet/modem
Debug and recovery ports	Recovery port	USB recovery port on USB Type-C
	Debug console port	Serial debug console w/ UART-to-USB on USB Type-C
OS support	Nvidia Jetpack 6.2	NVIDIA Jetson Linux 36.4.3 (Jetpack 6.2 on Ubuntu 22.04)
Power input	DC input	9V – 36V DC power input[2] on a power jack with twist-locking
Operating Environment	Operation temperature	-25°C to 70°C
	Humidity	5% - 95% non-condensing
Heat dissipation	Cooling	Passive/active cooling
	Optional external fan	Optional, external speed-controlled fan for enhanced heat dissipation
Physical Characteristics	Dimensions	Fanless: 59 mm X 157 mm X 130 mm
	Weight	~ 1.2 Kg
	Mounting	Side / bottom VESA / DIN Rail mount

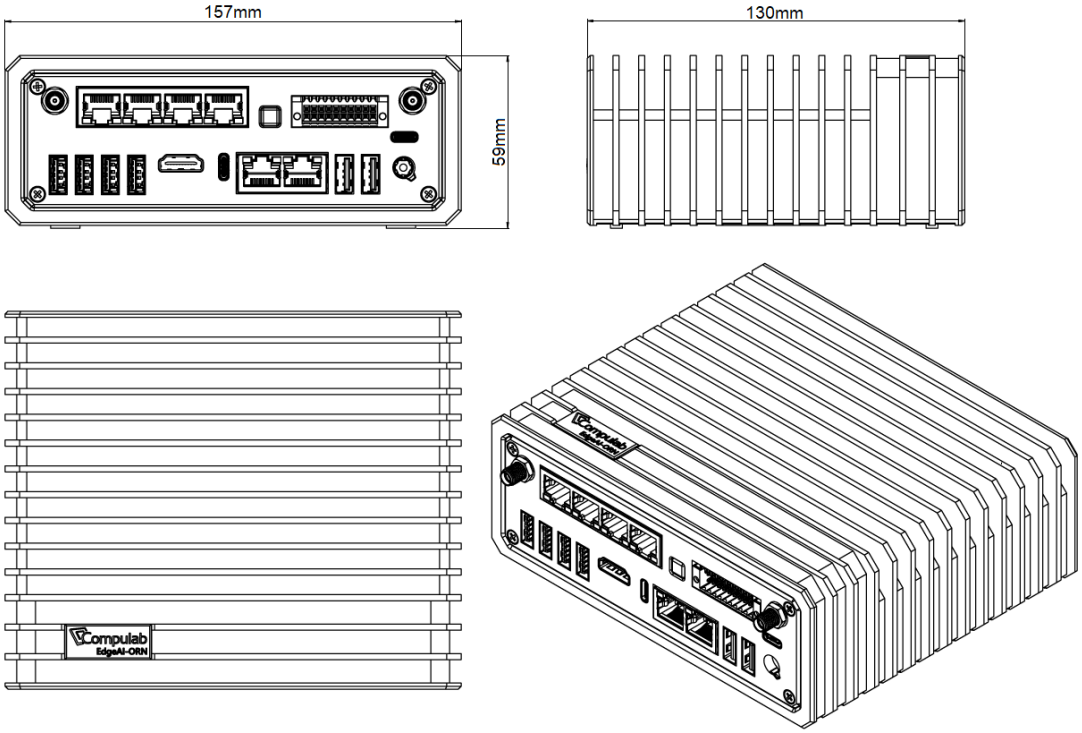
Notes:

1. The NVMe interface of Orin Nano modules is limited to Gen. 3
2. PoE input expansion requires 12V or more DC input

Block diagram



Dimensions



Interfaces

Location	Interface	Connector
Front Panel	4x USB 3.2 Gen. 2	4x USB Type-A
	HDMI 2.0	HDMI
	Recovery port	USB Type-C
	2 x 2.5/1Gb Ethernet ports	2 x RJ45
	2x USB 2.0	2x USB Type-A
	9V – 36V DC power input[2]	1x 5.5 mm power jack with twist-locking
	Console port	USB Type-C
	Isolated RS-232/422/485	Terminal block
	Isolated CAN bus	Terminal block
	Isolated 2x GPI + 2x GPO	Terminal block
	Power button	On/Off push button with power LED
	2x antennas for Wi-Fi/BT or modem	2x SMA
	Optional Camera input expansion 4x PoE	4x RJ45
	Optional Camera input expansion 4x GMSL2	4x FAKRA Z
	Optional Camera input expansion 4x FPD Link IV	4x FAKRA Z
Rear Panel	Micro-SIM Tray for M.2 LTE/5G modem	Micro-SIM Tray
	4x antennas for Wi-Fi/BT or modem	4x SMA
	Optional OOB management module	RJ45, Micro-SIM slot, LEDs + buttons

Location	Form factor	Usage	Interface
Internal Bottom	M.2 Key-M up to 2280	NVMe storage	PCIe Gen 4[1] x4
	M.2 Key-B up to 3042 or 3052	LTE/5G modem	USB 3.2 + 2.0
	M.2 Key-E 2230	Wi-Fi/BT module	PCIe + UART + I2S + USB 2.0

Notes:

1. The NVMe interface of Orin Nano modules is limited to Gen. 3
2. PoE input expansion requires 12V or more DC input

Expansion boards

Name	PN	Description
EB-EDGEPOE	FPOE	4x 2.5GbE on RJ45 with PoE PSE power delivery Type 1 (15.4W per port)
EB-EDGEDES-F	FFPD	4x FPD Link IV deserializer on FAKRA Z with PoC power delivery
EB-EDGEDES-G	FGMSL	4x GMSL2 deserializer on FAKRA Z with PoC power delivery
EB-EDGEMIPI[1]	FCSI	2x 22-pin flex connectors MIPI-CSI lanes: 1x/2x/4x + 1x/2x (Jetson Orin dev. kit pin-out)
Bolt OOB enabler	FOB	Allxon Bolt Out of Band enabler with Ethernet and optional Modem

Notes:

1. EB-EDGEMIPI is intended for use without the standard enclosure.

Minimum requirements

To use EdgeAI-ORN you will need:

- A monitor with HDMI input
- Storage device (if not pre-installed)
- USB keyboard and mouse
- For Barebone models:
  - compatible Jetson module
  - A monitor with HDMI input
  - NVMe storage
  - USB keyboard and mouse
  - Operating system

Identifying EdgeAI-ORN configuration

Your EdgeAI-ORN configuration is detailed on the label attached to the bottom of the computer.

Quick Start Guide

Several EdgeAI-ORN models are sold “Barebone” – without Jetson module and storage. To install Jetson module and storage please consult “Installation and Service” below.

Choosing placement for EdgeAI-ORN

Please consider the following when placing EdgeAI-ORN

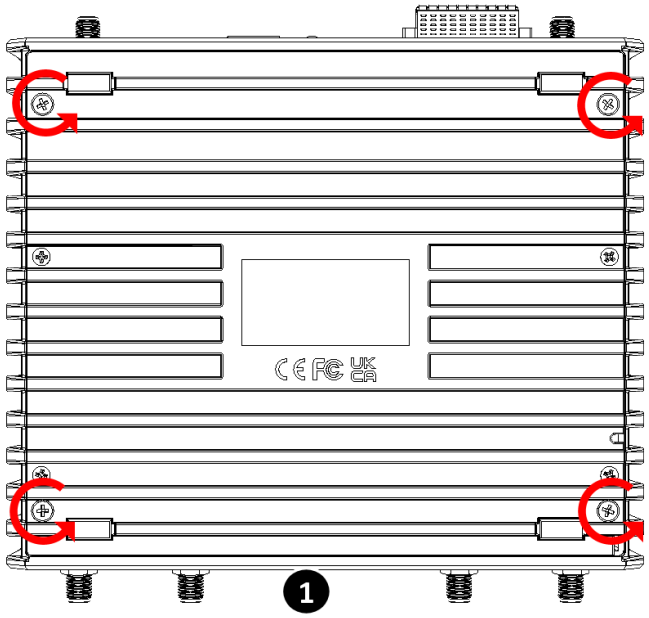
- Do not place EdgeAI-ORN in a small closed space having no airflow
- Allow at least 10 cm of clearance on left, right and top for effective airflow

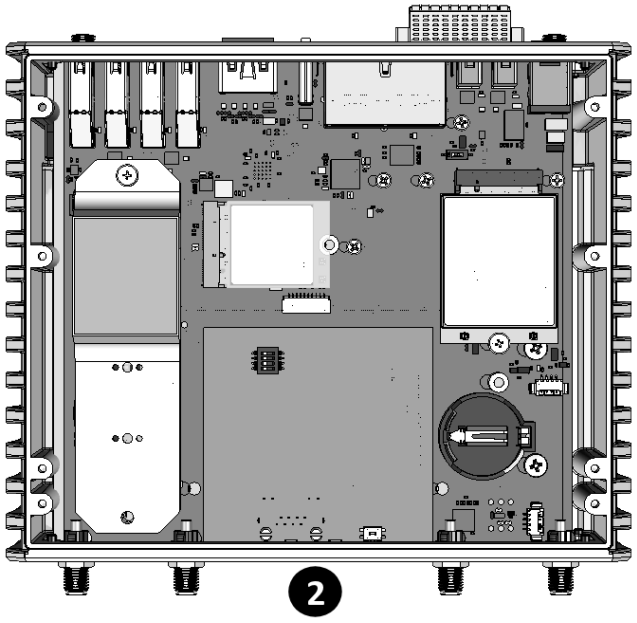
Opening EdgeAI-ORN

To install the Jetson module, storage device, cellular modem, Wi-Fi module, RTC battery, or camera extensions, you will need to open the EdgeAI-ORN enclosure.
*Required tool: Phillips screwdriver.

To open EdgeAI-ORN please follow these steps:

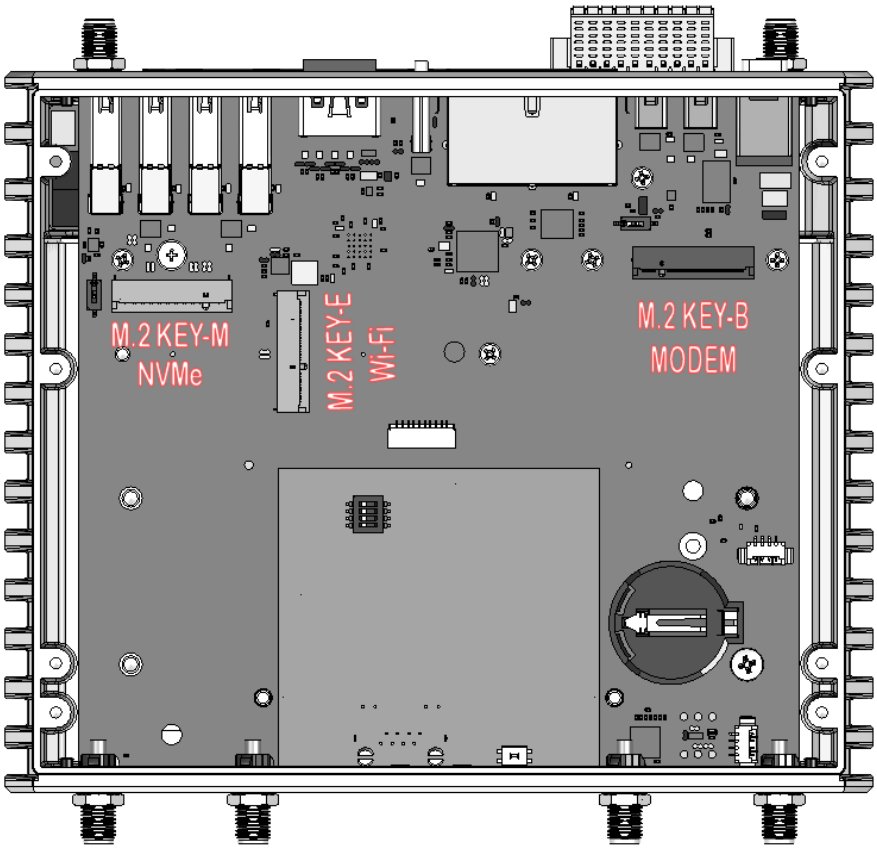
1. Place EdgeAI-ORN on a flat surface bottom-up.
2. Open the four screws using the Phillips screwdriver (counter clock-wise).
3. Lift the bottom cover to remove it.



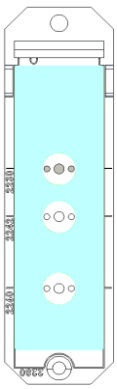


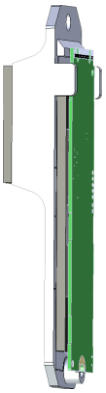
Installing M.2 NVMe storage

EdgeAI-ORN can accept 2230, 2242, 2260 or 2280 M.2 NVMe drive on M.2 Key-M socket (see below)

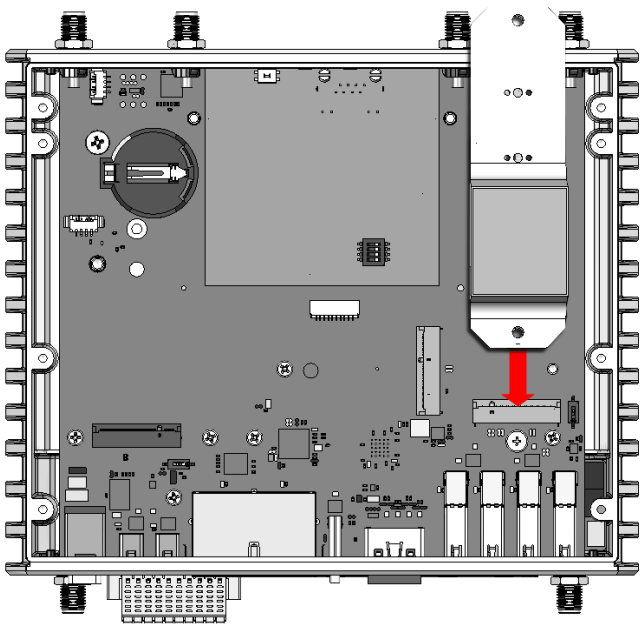


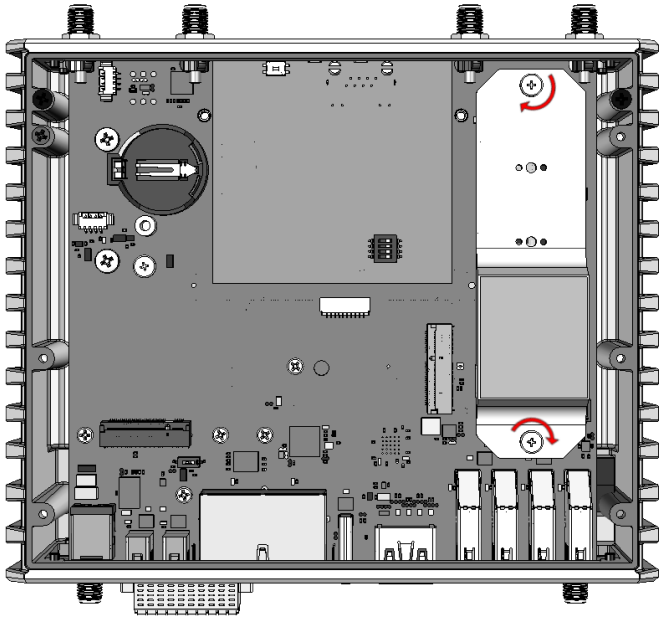
1. Peel off the protective film from the thermal pad (NVMe side of the cooling plate) and stick the NVMe module onto it as shown below.





2. Position the M.2 plate connectors over the SBC sockets and press down firmly until fully seated. The plate's holes should align with the board's spacers.

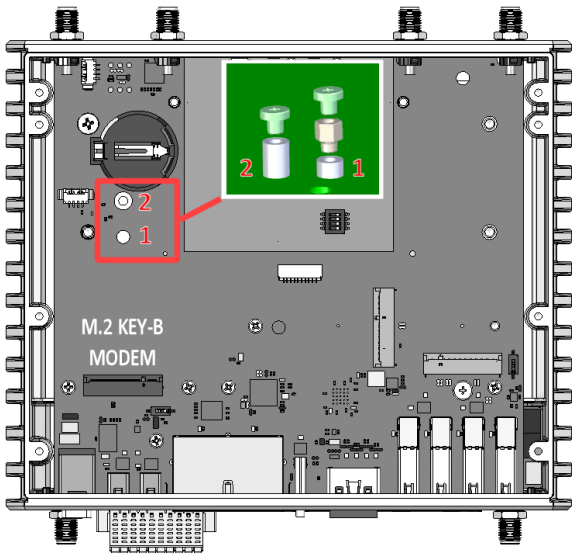


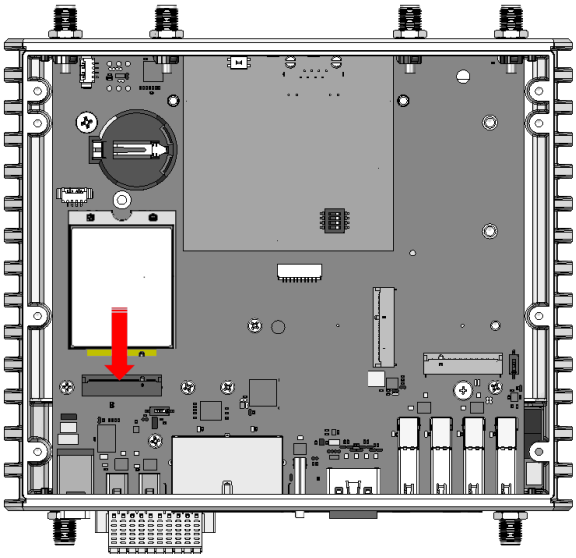


3. Tighten the two panel screws.
4. Next, place the bottom cover back and secure it with its screws

Installing Optional modem

1. For installing modem with 3042 form factor - install the standoff spacer into the appropriate mounting hole on the SBC, above the M.2 Key-B slot (see #1 on the image below). For modems with 3052 form factor – use the soldered standoff #2.
2. Insert the modem into the M.2 Key-B slot and fasten it using the panel screw.

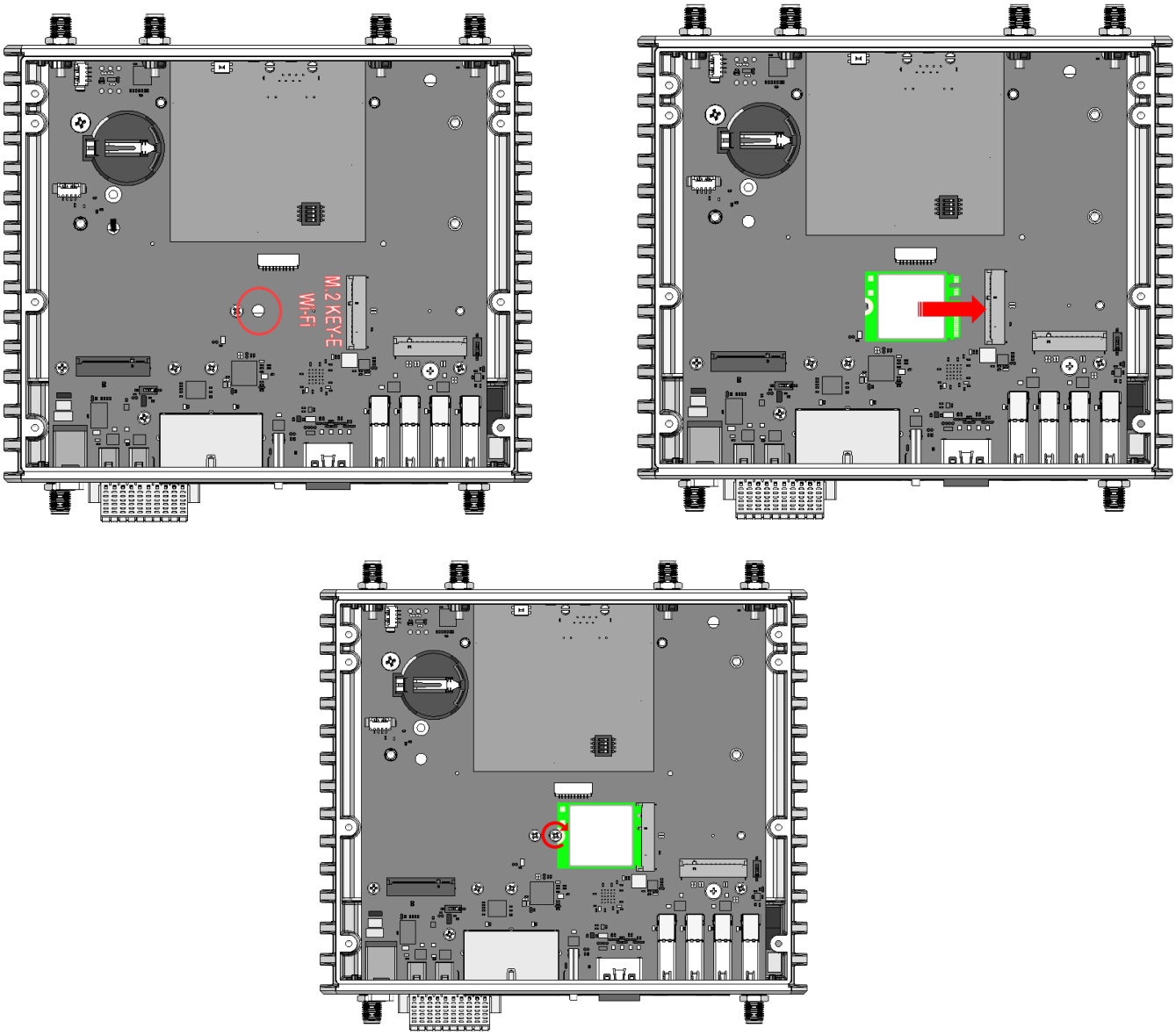




3. Connect the end of the antenna cables to the appropriate connectors on the modem. Connect the rubber antennas to the appropriate SMA connectors on the rear panel.
4. Reinstall the bottom cover and secure it with its screws.

Installing Optional Wi-Fi/BT Module

1. Install the standoff spacer into the appropriate mounting hole on the SBC, above the M.2 Key-B slot
2. Insert the Wi-Fi/BT module into the M.2 Key-B slot and fasten it using the panel screw (see image below).

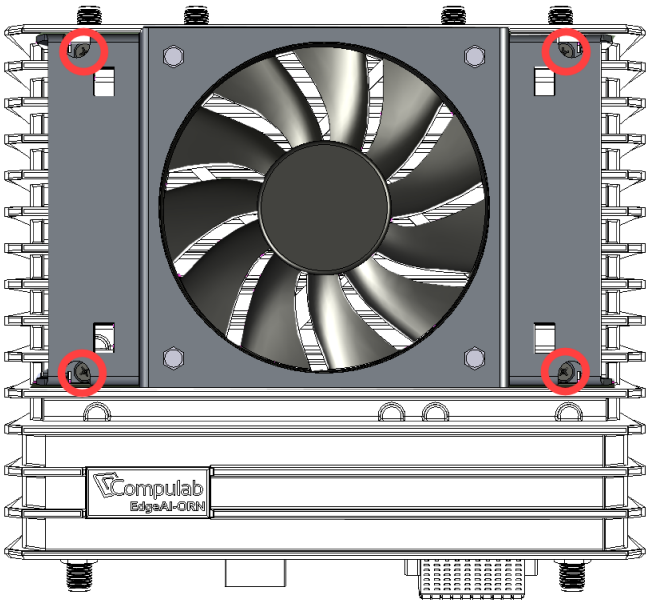


3. Connect the end of the antenna cables to the appropriate connectors on the Wi-Fi/BT module. Connect the antennas to the appropriate SMA connectors on the front panel.
4. Reinstall the bottom cover and secure it with its screws

Installing External cooling FAN

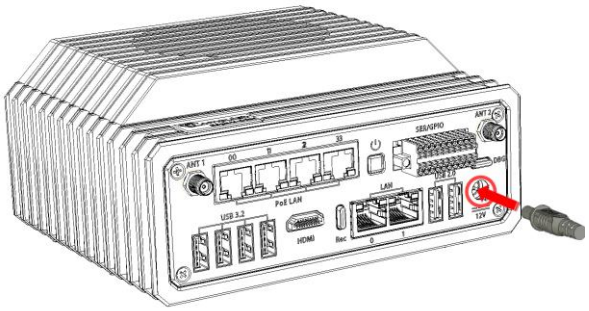
1. Open the bottom cover of the EdgeAI-ORN device.
2. Route the fan cable through the designated opening in the chassis.
3. Connect the fan cable to socket **P4** with FAN label printed near the connector on the SBC.
4. Reattach the bottom cover and secure it with its screws.
5. Secure the bottom side of the fan to the top cover of the device using four screws, as shown below.
6. Carefully route the fan cable between the fins of the top panel and hide it using the plastic cover included in the kit.

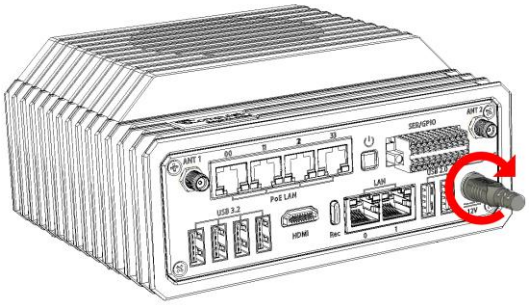
7. Place the plastic fan cover with ribs onto the fan base and press firmly until it locks into place.



Power connector insertion and locking/unlocking

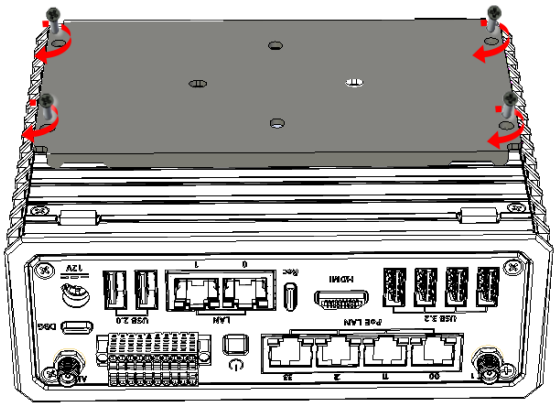
1. Connect the power barrel plug to the power socket (see image below).:
2. Push firmly and rotate clockwise until the locking mechanism clicks into place.

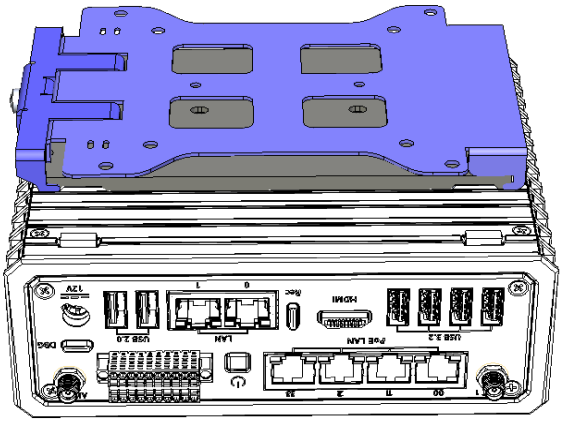




VESA assembly

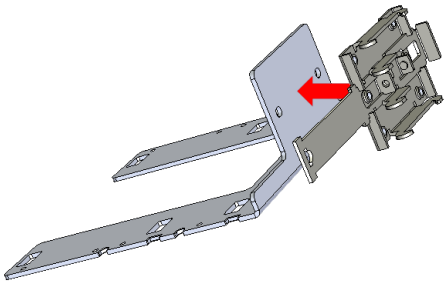
1. Secure the adjustment VESA plate to the device's bottom cover with four screws.
2. Attach the VESA bracket to the adjustment plate.

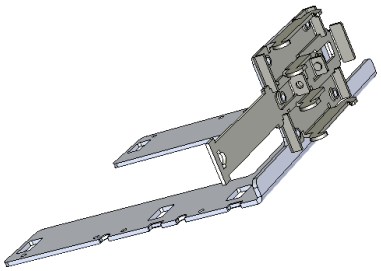




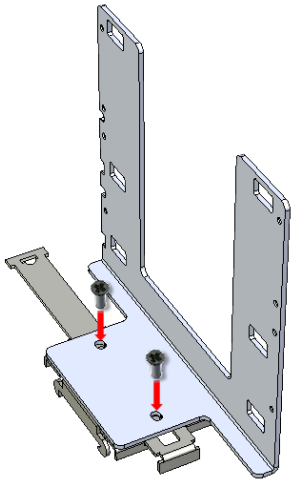
Side DIN assembly

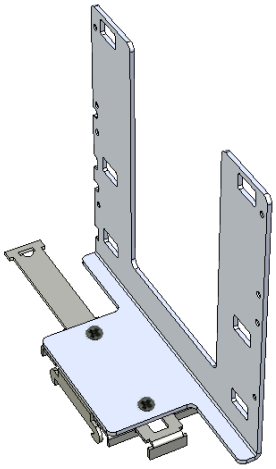
1. Align DIN rail clips to the adapter



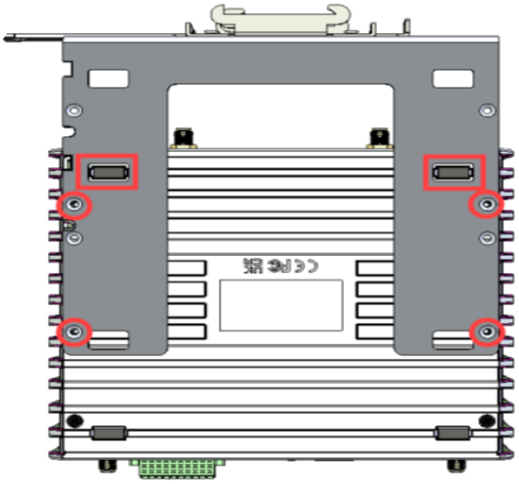


2. Secure it with two screws

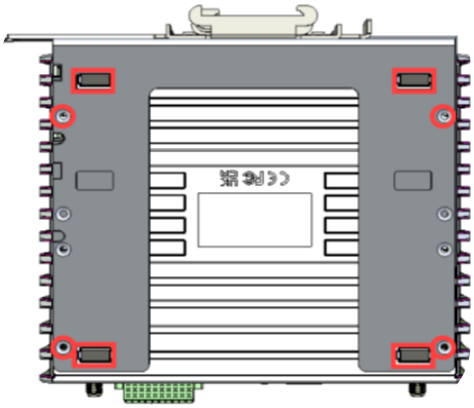




3. The next step depends on the configuration of your device - whether antennas or an Ethernet cable are connected to the back panel:
    a. If your device is supplied with an OOB management module of antennas on the back panel antennas – align your DIN rail adapter and tight it with four screws as shown in PIC #A.
    b. Include no OOB management module and no antennas on the back panel – use the following way of assembling – PIC #B.



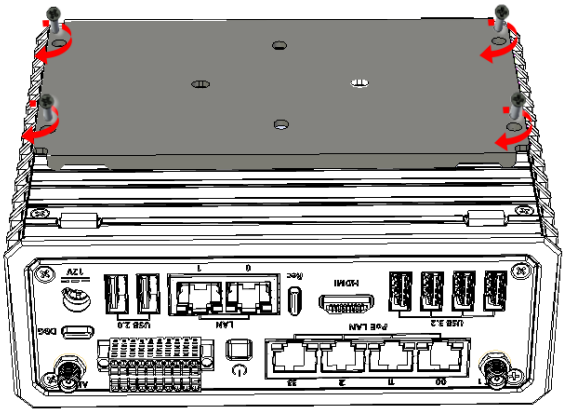
PIC #A

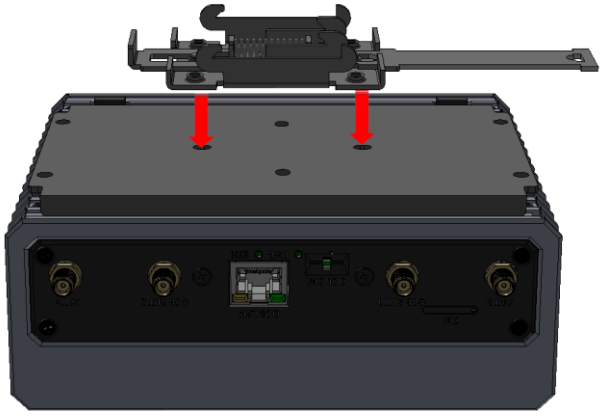


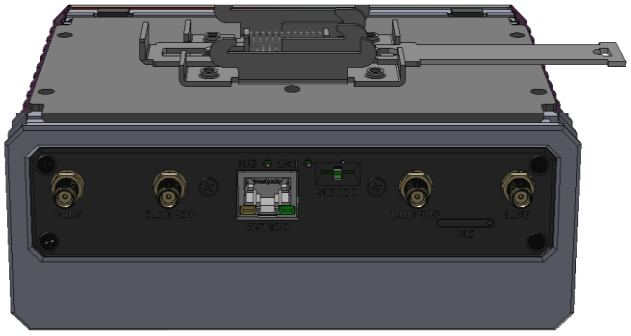
PIC #B

Bottom DIN assembly

1. Secure the adjustment VESA plate to the device's bottom cover with four screws
2. Align the DIN rail clips to the adapter
3. Secure it with two screws

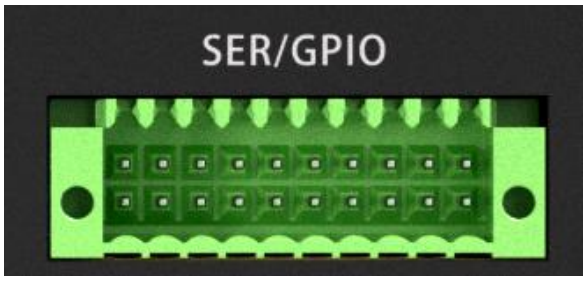


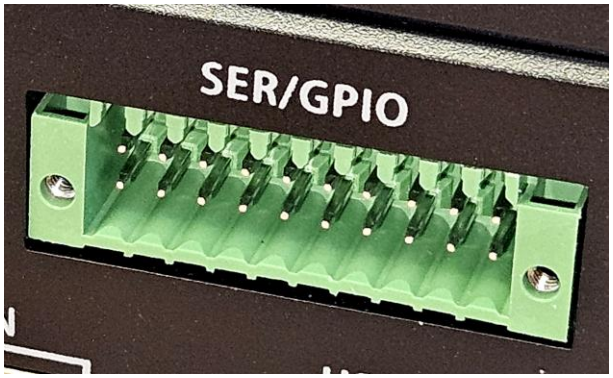




Using Serial/GPIO/CanBus connector

Terminal Block Pin-out





The wire connected should be 20 - 26 AWG, with stripping length of 7 - 8mm

Pin	Name	Type	Description
1	DIO_IN0	Iso. I	Isolated digital Input 0
2	DIO_VIN	Iso. PWR	DO isolated ref. voltage
3	DIO_IN1	Iso. I	Isolated digital Input 1
4	DIO_OUT0	Iso. O	Isolated digital output 0
5	DIO_GND	Iso. PWR	DIO isolated ref. ground
6	DIO_OUT1	Iso. O	Isolated digital output 1
7	RS232_RTS / RS485_FD_TXP/ RS485_HD_DP	Iso. IO	RS-232 mode: RTS RS-485 full duplex: TX+ RS-485 half duplex: D+
8	RS232_TX / RS485_FD_TXN / RS485_HD_DN	Iso. IO	RS-232 mode: TX RS-485 full duplex: TX- RS-485 half duplex: D-
9	RS232_CTS / RS485_FD_RXN	Iso. IO	RS-232 mode: CTS RS-485 full duplex: RX- RS-485 half duplex: Not connected
10	RS232 RX / RS485_FD_RXP	Iso. IO	RS-232 mode: RTS RS-485 full duplex: RX+ RS-485 half duplex: Not connected
11	RS485_TERM_CTRL	Iso. Ctrl	RS-485 120Ω termination control: Connected to GND (pin 12): Termination on Not connected: Termination off
12	RS232_485_CAN_GND	Iso. PWR	RS-232, RS-485, CAN bus and PWR_BTN isolated ground
13	RS485_HD-FD#_CTRL	Iso. Ctrl	RS-485 full duplex or half duplex control: Connected to GND (pin 12): Full duplex Not connected: Half duplex

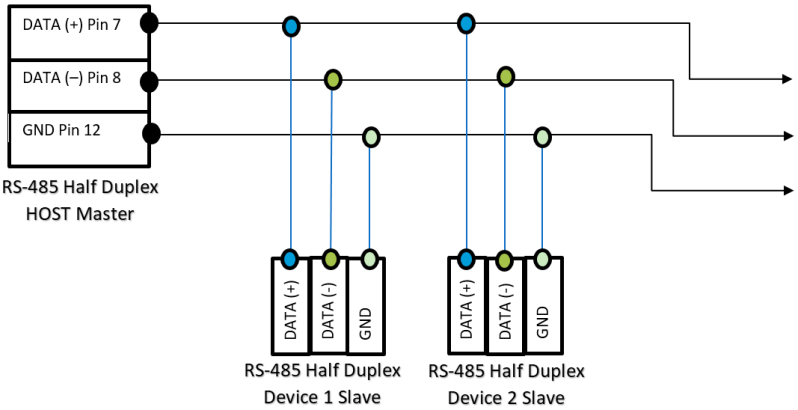
14	RS485-RS232#_CTRL	Iso. Ctrl	RS-485 or RS-232 control: Connected to GND (pin 12): RS-232 Not connected: RS-485
15	CAN_H	Iso. IO	CAN bus High-level input/output line
16	CAN_L	Iso. IO	CAN bus Low-level input/output line
17	PWR_BTN	Iso. I	Isolated remote power button input
18	CAN_TERM_CTRL	Iso. Ctrl	CAN bus 120Ω termination control: Connected to GND (pin 12): Termination on Not connected: Termination off
19	GND_SYS	PWR	Internal system ground
20	CHASSIS	PWR	Device chassis (Protective earth connection)

Supported Interfaces

- RS-485 (Half Duplex and Full Duplex)
- RS-232
- DIO (Digital Inputs/Outputs)
- CAN-BUS
- Power-Switch (External Power Control)

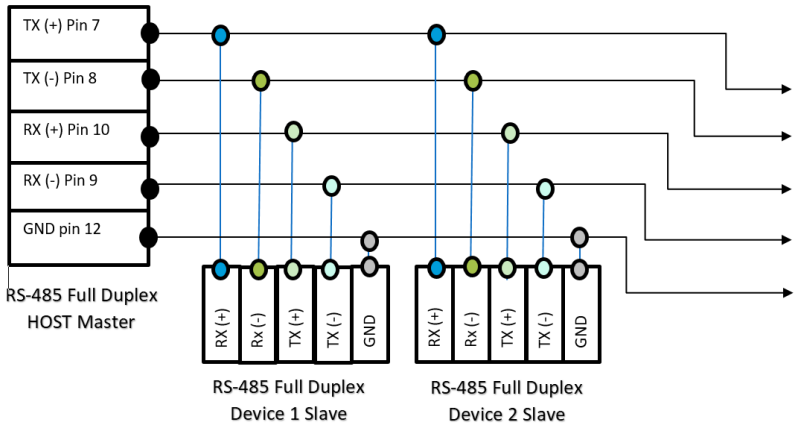
RS-485 Half Duplex (default)

- Termination: short pins 11–12
- DATA+ → Pin 7
- DATA– → Pin 8
- GND → Pin 12



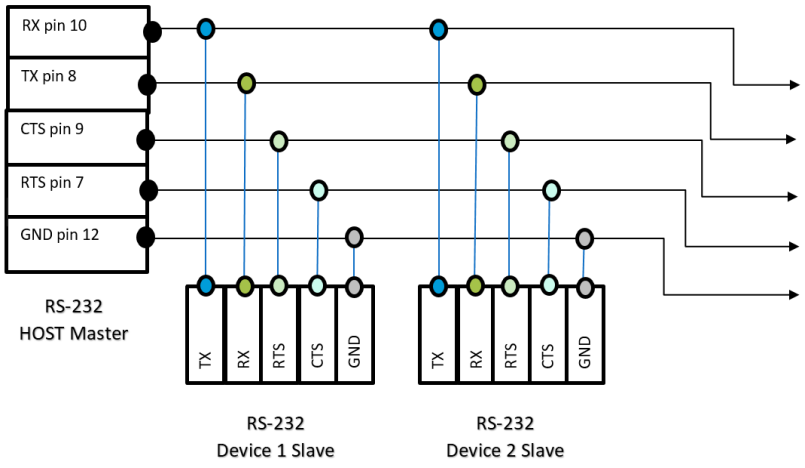
RS-485 Full Duplex

- Termination: short pins 11–12 and 13–12
- TX+ → Pin 7
- TX– → Pin 8
- RX– → Pin 9
- RX+ → Pin 10
- GND → Pin 12



RS-232

- Termination: short pins 12–14
- TX → Pin 8
- RX → Pin 10
- GND → Pin 12
- Optional: CTS → Pin 9, RTS → Pin 7
- DIO (Digital In/Out)
- Power supply VCC (+) → Pin 2



- GND (–) → Pin 5

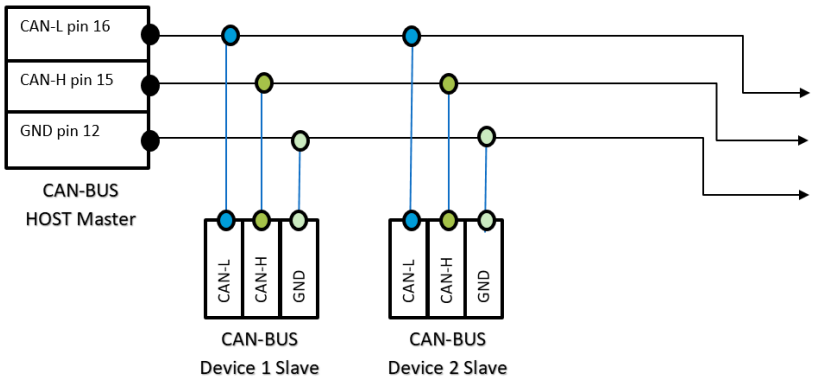
Function	Pin	GPIO	Direction
Digital In 1	1	0/85	Input
Digital In 2	3	0/43	Input
Digital Out 1	4	0/105	Output
Digital Out 2	6	0/106	Output

Connections:

- Short Pin 1 to Pin 4 (OUT1 controls IN1)
- Short Pin 3 to Pin 6 (OUT2 controls IN2)
- Digital In Voltage: 11–30V
- Digital Out Voltage: 5–36V, Max Current: 1A per pin

CAN-BUS

1. Termination: short pins 18–12
2. CAN-L → Pin 16
3. CAN-H → Pin 15
4. GND → Pin 12
5. Supported: CAN-BUS 2.0 (up to 1 Mbps), CAN FD (up to 5 Mbps)



Serial Setup (RS-232 / RS-485)

1. Check available serial ports:

```
ls /dev/ttyUSB*
dmesg | grep tty
```

2. Launch minicom setup:

```
sudo minicom -s
```

- Press **E**: Change baudrate (9600, 115200, etc.)
- Press **F**: Toggle hardware flow control (for RS-232)
- Press **H**: Enable RS-485
- Press **L**: Enable termination (if pins 11–12 are shorted) (for RS-485 only)

3. Save configuration, exit and start terminal again:

```
sudo minicom -D /dev/ttyUSB0
```

CAN-BUS Setup

1. List CAN interfaces:

```
ls /sys/class/net/can*
ip a
```

2. Set bitrate (example for 1 Mbps):

```
ip link set can0 type can bitrate 1000000
ip link set can0 up
```

3. Read CAN frames:

```
candump can0 &
```

4. Send CAN frame:

```
cansend can0 111#1122334455667788
```

5. Stop background reading:

```
sudo killall candump
```

DIO Handling

HW pin number	SW port number	INPUT/OUTPUT
4	GPIOCHIP 0, PORT 105	OUTPUT
6	GPIOCHIP 0, PORT 106	OUTPUT
3	GPIOCHIP 0, PORT 43	INPUT
1	GPIOCHIP 0, PORT 85	INPUT

1. Set Digital Out pins to HIGH:

```
sudo -i
echo $(sudo gpioset --mode=wait 0 105=1) &
echo $(sudo gpioset --mode=wait 0 106=1) &
```

2. Read Digital Inputs:

```
sudo gpioget 0 85
sudo gpioget 0 43
```

3. Set Digital Out pins to LOW:

```
sudo kill -9 $(jobs -p)
echo $(sudo gpioset --mode=wait 0 105=0) &
echo $(sudo gpioset --mode=wait 0 106=0) &
```

4. Read inputs again to verify state

Connecting EdgeAI-ORN

To set up the EdgeAI-ORN, follow these connection steps:

1. Connect a monitor to the HDMI port.
2. Connect a USB keyboard and mouse to the USB 2.0 or USB 3.2 ports.
3. Plug an Ethernet cable into the Ethernet port.
4. For models with Wi-Fi and/or cellular: attach the Wi-Fi antennas to the SMA connectors by turning them clockwise until they are firmly secured.
5. Insert the DC plug into the DC-in jack on the device.
6. Connect the power supply to the AC power cord, then plug the cord into an AC outlet.

Entering BIOS Setup

1. Turn off the EdgeAI-ORN.
2. Turn on while holding down the Del key, until access into BIOS utility

EdgeAI-ORN with Nvidia Jetpack pre-installed

Nvidia Jetpack loads automatically on power up. Upon boot you will be guided through first-boot setup procedure.

Installing an operating system on EdgeAI-ORN

Please consult https://wiki.edge.compulab.com/index.php?title=EdgeAI-ORN

Using Debug port

1. *Overview*

EdgeAI-ORN provides a dedicated debug port for system bring-up, OS installation, and low-level troubleshooting.

The debug port exposes the primary UART interface (UART1) of the Jetson Orin module through an onboard USB-to-UART bridge, making it directly accessible from a host computer via a USB Type-C connector.

The connector is marked 'DBG' on the EdgeAI-ORN front panel.

2. *Features*

- Interface: UART1 (SoC)
- Bridge IC: USB-to-UART converter (FTDI/CP210x depending on build revision)
- Connector: USB Type-C (front panel, labeled DBG)
- Function: Provides serial console access to bootloader, kernel, and OS terminal

3. *Connection Procedure*

a. Cabling

- Connect a USB Type-C cable between the DBG port of EdgeAI-ORN and a host computer (Windows, Linux, or macOS).
- Use a data-capable USB cable (not charge-only).

b. Driver Installation

- On Linux: most distributions include the driver (ftdi_sio or cp210x) by default.
- On Windows: install the corresponding VCP (Virtual COM Port) driver from the bridge vendor's website if not auto-detected.

c. Port Detection

- Linux: Run: dmesg | grep ttyUSB or check /dev/ttyUSB0 (or higher).
- Windows: Check Device Manager → Ports (COM & LPT) for "USB Serial Device (COMx)".

4. *Serial Console Settings*

Use any terminal emulator (e.g. minicom, screen, picocom, PuTTY, Tera Term).
Recommended parameters:

- Baud rate: 115200 bps
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

Example (Linux, with screen): screen /dev/ttyUSB0 115200

5. *Usage Scenarios*

Bootloader access:

- Power on/reset the device while connected.
- U-Boot messages will appear immediately.
- You can interrupt autoboot to enter bootloader commands.

Kernel and OS messages:

- Monitor kernel log output during boot.
- View critical messages even if networking or storage is not initialized.

Headless access:

- Provides a login console when no monitor/keyboard is attached.
- Useful for initial configuration or recovery.

6. *Troubleshooting*

a. **No device detected**:

- Verify USB cable supports data.
- Check if /dev/ttyUSB* or COM port appears on the host.
- Install/update bridge drivers if needed.

b. **Garbled output**:

- Ensure correct baud rate (115200).
- Disable hardware/software flow control.

c. **Multiple UART devices connected**:

- Identify correct port by disconnecting/reconnecting the DBG cable and checking system logs (dmesg).

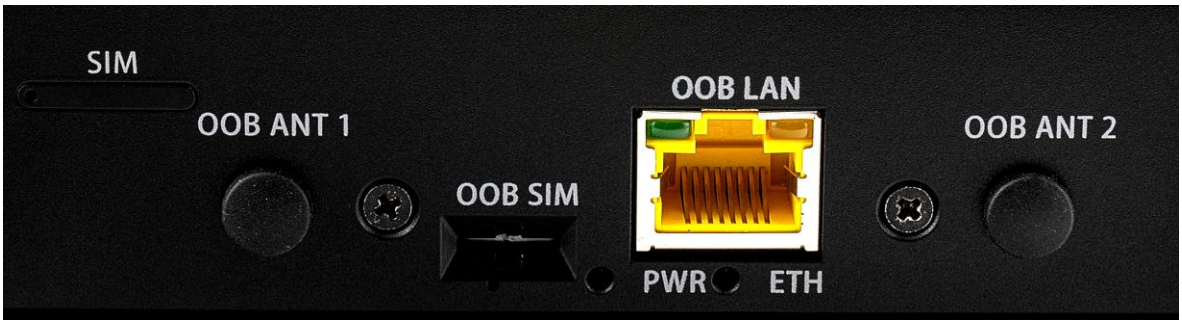
Using Recovery port

The recovery port is used for flashing a bootloader and/or a Linux image on the NVMe.

1. The connector is marked 'Rec' on the EdgeAI-ORN front panel.
2. To enter recovery mode, connect a USB Type-C cable between the host computer to the target EdgeAI-ORN.
3. While the host computer is on, connect the EdgeAI-ORN to the power source.
4. At this point, 'NVIDIA Corp.' device should be discoverable on the host computer using lsusb command.
5. Flash the OS image or the bootloader using a tool like l4t_initrd_flash.sh.

Note: 'Recov. EN' switch (SW3) on the EdgeAI-ORN main board will prevent the entry to recovery mode when in OFF state. By default, SW3 is on, and the recovery mode is accessible.

Using ODB management



Out-of-Band (OOB) Management via Allxon Bolt

EdgeAI-ORN supports **Allxon Bolt**, a dedicated OOB Enabler module, delivering robust remote device control—even when the system is unresponsive.

Why use Allxon Bolt

- **Basic and Advanced Power Controls**: remotely Power ON/OFF, Force Shutdown, and Reset your device.
- **Advanced OOB Features**: supports power status detection, device "Always ON" mode, and scheduled power control—unlocking enhanced automation.
- **Integrated Connectivity**: includes a dedicated RJ-45 OOB Ethernet port and a Nano-SIM slot for LTE (modem required), allowing management via wired or cellular networks.
- **Cloud Serial Console**: provides secure, low-level access to the device's console—ideal for BIOS, bootloader, and debugging access

SIM Connectivity Requires a Modem

To use mobile (LTE) access, you must install a compatible modem in the Allxon Bolt module. The Nano-SIM slot alone is not sufficient; the LTE functionality is only enabled when the modem is physically present and correctly configured.

LTE Modem Compatibility for Allxon Bolt

The **Allxon Bolt Out-of-Band (OOB) Enabler** supports LTE connectivity through its **Nano-SIM slot**.
To enable cellular OOB access, a compatible LTE modem must be installed in the module. The SIM slot alone does not provide connectivity without the modem.

Supported LTE modems:

- Quectel **EC21 series**
- Quectel **EC25 series**
- Quectel **EG25-G**

Installation Notes

1. Insert the LTE modem into the Bolt's **mini-PCIe slot**.
2. Insert a valid **Nano-SIM card** into the Bolt SIM slot.
3. Connect the external **LTE antennas** to the dedicated antenna connectors.
4. Configure the modem and OOB functions using the Allxon Portal.

***Important*:** Only the listed modem models are officially supported. Using other LTE modules may result in incompatibility or unstable operation.

Official Allxon Documentation

For detailed setup steps, customers should follow Allxon's official guides:

- Allxon Bolt Hardware Wiring and Settings
- How to Enable Out-Of-Band Management on Device
- Allxon On-Prem OOB CLI Tool Guide

For Complete Setup Instructions

Please refer to **Allxon's official documentation**, where you can find step-by-step guidance for your specific OOB hardware:

- **Allxon Bolt OOB Enabler Hardware Wiring and Setting** — setup details for Bolt module.
- **How to Enable Out-Of-Band Management on Device** — pairing Bolt with the host device and network configuration.
- **Allxon On-Prem OOB CLI Tool Guide** — for intranet-based remote control via CLI.

Before servicing EdgeAI-ORN

To avoid damaging EdgeAI-ORN, perform the following steps before you begin working inside the computer.

1. Ensure that you follow the Safety instructions.
2. Turn off your computer

⚠ CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

Turning off EdgeAI-ORN

Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

Warranty and RMA

Warranty

- C-Lab guarantees products against defects in workmanship and materials for a period of 60 months from the date of shipment.
- Your sole remedy and C-Lab's sole liability shall be for C-Lab, at its sole discretion, to either repair or replace the defective product at no charge.
- This warranty is void if the product has been altered or damaged by accident, misuse or abuse.

RMA

- Keep the original package for shipping.
- Please contact the seller of that EdgeAI-ORN.
- In case of HW failure of an EdgeAI-ORN under warranty, please consult:
- https://edge.compulab.com/about/sales-terms/#rma
- When issuing an RMA please provide the following required information:
    - o EdgeAI-ORN serial number
    - o Name and address of buyer or Invoice number
    - o Problem description
- If EdgeAI-ORN was purchased directly from C-Lab, please email: rma_admin@compulab.co.il

Regulatory Information

EdgeAI-ORN
Manufacturer: Compulab Ltd.

This device complies with Part 15 of the 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.

Statement

Changes or modifications to this equipment not expressly approved by the party responsible for compliance (Compulab Ltd.) could void the user's authority to operate the equipment

WEEE

Statement

NOTE: 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, 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 circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

This symbol means that you must dispose of an electrical item AND/OR containing in it Li-Mn battery separately from general household waste when they reach the end of their useful life. Take your PC or the battery to your local waste collection point or center. This applies to all countries of the European Union, and to other countries with a separate waste collection system.