Edge AI Box - NX Outdoor

User's Manual

Version 2.4

Edge AI Box - NX Outdoor: EHC-JNX-551-W (Wi-Fi Model), EHC-JNX-551-L (LTE Model)

Document: doc02551

Introduction

First, allow us to thank you for your purchase.

Please read this User's Manual carefully so that you can fully utilize the capabilities of this product in a correct and safe manner.

Although this product was shipped after undergoing thorough quality control procedures, we still advise that you perform an operations check prior to use.

Please contact us if the item has sustained damage or does not perform to specifications.

■ **About this User's Manual**
- The products and specifications contained within this User's Manual may be changed without prior notice due to product revisions or other reasons.
- Reprinting and/or altering this document, either entirely or in part, is prohibited.
- The utmost care was taken in creating this document. Nonetheless, please contact us if there are any points of confusion, errors, or other items that catch your attention.
- Please understand that, even in the cases mentioned above, our company bears no responsibility for outcomes resulting from the use of this product.

■ **Trademarks**
- Linux is the registered trademark of Linus Torvalds as recognized in Japan and other countries.
- "Wi-Fi" and the "Wi-Fi" logo are registered trademarks of the Wi-Fi Alliance®.
- EDGEMATRIX is a registered trademark of EDGEMATRIX, Inc.
- NVIDIA is a registered trademark of the NVIDIA Corporation.
- Jetson is a trademark of the NVIDIA Corporation.

Revision History

Date of Issue	Version	Revision Details
Nov. 14, 2022	2.4	Correct CE Conformity URL
Nov. 8, 2022	2.3	Added information for CE Conformity
Sep. 17, 2021	2.2	Added some caution at SIM insertion
Aug. 30, 2021	2.1	Corrected 802.3af to 802.3at
Aug. 12, 2021	2.0	English version available
March 2021	1.0	Official release
October 6, 2020	PRELIMINARY	

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Safety Precautions

Please read these Safety Precautions carefully before using this product and only use it as indicated herein.
Upon reading this documentation, please store it securely for future reference.
Please follow the warnings provided herein, as they are intended to prevent damage to property as well as injury to the user and/or other individuals.
The following safety precautions are provided to ensure the safe use of this product.

■ Class

The following classes are used to discern the degree of injury and/or damage sustained as a result of inappropriate operation.

⚠ **Danger**	Point of caution displayed when inappropriate use is likely to result in death and/or serious injury.
⚠ **Warning**	Point of caution displayed when inappropriate use can result in death and/or serious injury.
⚠ **Notice**	Point of caution displayed when inappropriate use is expected to result in mild injury and/or physical damage.

■ Code

The following codes are used to distinguish safety precautions.

Notice	This indicates a general safety precaution.
Shock Hazard	This indicates the risk of sustaining an electric shock.
Prohibited	This indicates a general safety precaution.
Do Not Disassemble	This indicates that disassembly of the product is prohibited.
Avoid Water	This indicates that handling of the product with wet hands is prohibited.
Note	This indicates that a specific precaution or usage guideline must be followed.

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Danger

Prohibited	**Do not use, store, or leave in an area of high temperature or in an area that may become hot (next to a fire, near a heating device, in direct sunlight, etc.)** Fire, injury, and/or electric shock may result.
Prohibited	**Do not allow this product to come in contact with beverages, perspiration, sea water, pet urine, or other fluids.** Fire, burns, injury, and/or electric shock may result.
Prohibited	**Do not allow beverages, perspiration, sea water, pet urine, or other fluids to enter the connector unit.** Fire, burns, injury, and/or electric shock may result.
Prohibited	**Do not allow contact with, or place upon, sand, dirt, or mud. Moreover, do not touch the product with sandy or otherwise dirty hands.** Fire, burns, injury, and/or electric shock may result.
Do Not Disassemble	**Please do not disassemble or alter the product.** Fire, burns, injury, and/or electric shock may result.
Shock Hazard	**Do not touch this product or the connector cable during a lightning storm.** Electric shock may result.

Warning

Notice	**Disconnect the power cable from the product immediately if the product produces smoke, abnormal odors, abnormal sounds, or if the product becomes too hot to touch.** Fire, burns, and/or electric shock may result.
Prohibited	**Do not drop, step on, hit, or otherwise apply strong impact or vibration to the product.** Fire, burns, injury, and/or electric shock may result.
Avoid Water	**Do not touch this product or the connector cable with wet hands.** Electric shock may result.
Prohibited	**Do not insert the following objects into the product.** Fire may result from electric short. • Metallic objects • Water or other liquids • Flammable objects • Chemicals

Prohibited	**Only use the provided AC adapter.** Fire, electric shock, or smoke may result.
Prohibited	**Do not damage the provided AC adapter cord.** Fire and/or electric shock may result.
Note	**Ensure the following points when handling the AC adapter.** Fire, electric shock, sparks, and/or smoke may result. • Do not use when folded or wrapped up. • Do not excessively bend the base of the cord. • Do not place a heavy load on the cord. • Do not wrap in cloth or other material.
Prohibited	**Do not place on an unstable surface.** The item may fall over or drop, causing injury.
Note	**Unplug the power prior to installation/relocation.** Electric shock may result.
Note	**Turn off the power prior to connecting or attaching objects to the product.** Electric shock may result.
Prohibited	**Be sure to insert the SIM card into the correct location and with the correct orientation.** Fire, burns, injury, and/or electric shock may result.
Note	**Store vinyl bags and other wrapping materials out of the reach of children (particularly infants).** Inserting these materials in the mouth or around the head can lead to suffocation.
Note	**If the user is wearing an electronic medical device or other such device, check with the device manufacturer and/or seller prior to use to avoid electronic interference.** Electronic interference may hinder the normal operation of some medical devices.
Note	**Do not use this produce near electronic devices that employ high-precision controls or weak signals.** Electromagnetic waves may interfere with the normal operation of some electronic devices (hearing aids, cardiac pacemakers, etc.)

⚠ Notice

Prohibited	**Do not use this device in the following places.** Electric shock may result. • Baths or other areas with high humidity. • Near stoves, humidifiers, or other places with increased water, humidity, steam, oil smoke, etc.
Prohibited	**Do not make direct contact with this device while current is running through it or immediately after turning off the power.** Burns may result.
Prohibited	**Do not apply excessive force to the antenna.** Damage may result.
Prohibited	**Do not use the device if dust has built up on the power plug.** Fire may result.
Note	**Be sure to turn off the power and unplug the AC adapter before handling this product.** Electric shock may result.
Note	**Unplug the AC adapter when leaving this product unused for an extended period of time.** A leakage current fire may result due to degradation of electronic insulation.
Note	**Be careful not to cut your finger on chipped edges when handling the SIM card.** Chipped edges can be sharp, resulting in injury.

Cautions During Use

Usage Environment
- Avoid areas subject to frequent impact and/or vibration. Also, avoid dropping the product. Such usage environments may affect the delicate internal components of this product, causing damage and/or loss of functionality.
- Do not use or store this product in direct sunlight, under high temperature, under extreme cold, under high humidity, or in dusty areas. Damage may result.
- Please use the product within the specified temperature and humidity range.
  Temperature range: -30 to + 50°C
  Humidity range: 10 to 95% (avoid condensation)
- Do not vibrate, impact, or cut the power to this product during data writing or transmission. This may cause loss/corruption of data.

Installation
- Do not install near corrosive chemicals or in areas where corrosive gasses may be produced.
- Do not install in areas that allow for contact with substances that are flammable or act as solvents at low temperatures.
- Be sure to turn off the power to this device when attaching and detaching cameras, cables, etc. Attaching/detaching cameras, cables, etc. to this device while powered on can result in damage.
- Do not pull or bend cables, or place a load on the connectors. Damage to the connectors may result.
- Securely tighten all screws. Particular for the outdoor type device, please apply a torque of 7.5kgf to the hexagonal socket screw using a hexagonal spanner or torque wrench to protect the device from dust and water. Moreover, please tighten unused N jack connectors with a torque of 10kgf. If these screws are not properly tightened, the warranty may be invalidated even if the product is within the warranty period.
- Do not insert metallic or other objects into the LTE module. Damage may result.
- Please do not place a load on the LTE module in excess of what is required when inserting/removing the SIM card.
- Do not remove stickers or other adhesive indicators from the LTE module.
- Do not use excess force when inserting a pin into the jumper pin.
- For the outdoor type device, please make sure to tighten the waterproofing caps on unused connectors before use. With the waterproofing caps securely fastened, the device is certified IP67 water- and dust-proof.

Other
- Please turn off the power to this product before cleaning.
- To clean, wipe with a soft, dry cloth. Cleaning with alcohol, paint thinner, benzene, detergent, glass cleaner, or other chemicals may result in damage.
- When transferring or disposing of this product, delete all recorded data. If data remains on the device, it may be nefariously downloaded and used for malicious purposes by a third party.
- If you feel something is malfunctioning with this product, immediately cease operation, cut the power, and contact our company.
- The user is responsible for executing new commands after image update (Flash). Executing an incorrect command can damage the Edge AI Box image.
  In the unlikely event that a user-initiated update (Flash) causes a system malfunction, our company shall bear no responsibility. In such cases, repairs may require an additional fee even if the device is still under warranty.

1 Overview

The Edge AI Box is a device intended for AI processing of large on-site data sets.
Edge AI Box - NX Outdoor is intended for outdoor use. A Wi-Fi Model is included in the Edge AI Box – NX Outdoor - W, while an LTE Model is included in the Edge AI Box - NX Outdoor - L.

1.1 Key Features of the Edge AI Box - NX Outdoor

NVIDIA JETSON Xavier NX
The JETSON Xavier NX GPU module is included for optimal performance and rapid data processing.

Deep Learning
The Edge AI Box is a miniature computer ideal for environmental deep learning applications.

Edge Computing
Cameras and sensors are located nearby, allowing for real-time data processing. This reduces transmission latency, loss due to data compression, as well as data transmission costs. Moreover, analysis of uncompressed images provides superior precision. Discover hazards in real time and alert alarm systems for immediate risk avoidance.

Process data from ubiquitous IoT devices.
This small, fanless product can be installed near IoT devices, allowing for ethernet, USB, HDMI, LTE, and Wi-Fi compatibility.
Users can also power external cameras and other devices using PoE (Power over Ethernet).

Compatible with multiple connectivity standards, including LAN, Wi-Fi, and LTE.
The Edge AI Box uses connectivity features to send analysis results, logs, samples, metadata, and other information at high speeds to the cloud.
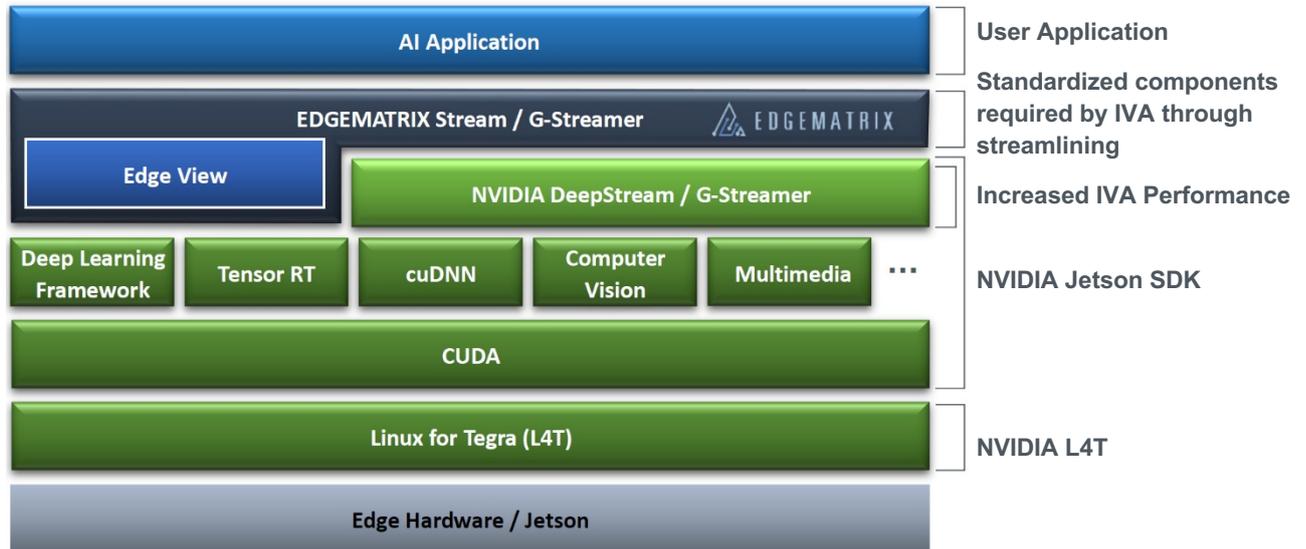*LTE transmission requires a SIM card.

Excellent environmental features
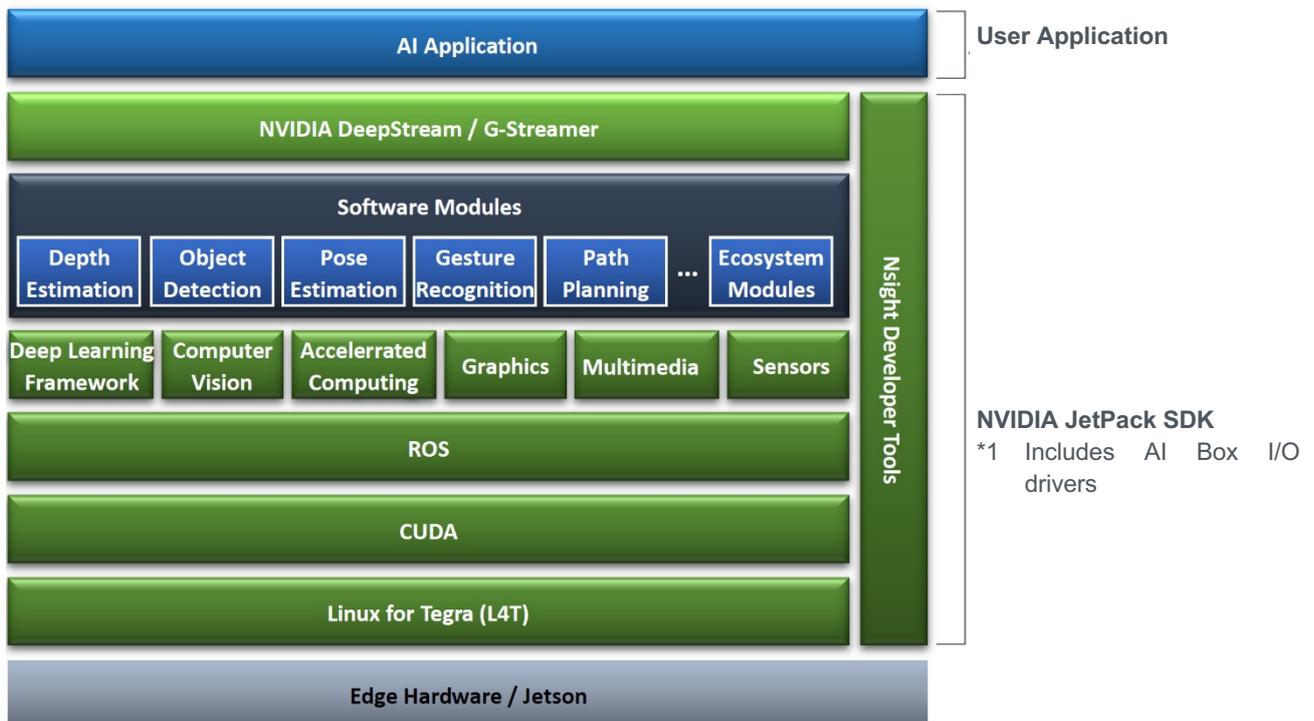The following environmental features are included for secure operations in an outdoor setting.
*   Robust
*   IP67-compliant waterproofing and dust-proofing
*   Lightning-resistant (Surge Protection)

1.2 Software Architecture in the Edge AI Box

When using the EDGEMATRIX® service

When using the NVIDIA JetPack SDK

2 Included Items

This product includes the following items. Please check that all items are present upon purchase. If an item is missing, please contact us.

Included Items
- Main Unit: 1
- Antenna *1   Wi-Fi: 2 (Wi-Fi Model)
                              LTE: 2 (LTE Model)
- Power cord *2: 1
- LAN cable (waterproof connectors): 1
- Waterproofing caps *3 AC 100 V: 1
                                           LAN: 1
                                           USB: 1
                                           HMDI: 1
                                           Unused: 1
                                           Antennae: 4

*1 Please only use the included antennae.
*2 The power cord is intended for use only with the Edge AI Box. It cannot be used with other devices.
*3 Be careful to not misplace the waterproofing caps.

| ⚠️ Notice	• Please make sure to tighten the waterproofing caps on unused connectors before use. If the device is used with unsecured waterproofing caps, the connectors may corrode, and/or the waterproofing quality of the device may be reduced. • The included LAN cable is provided for testing purposes. When using a LAN cable in a practical application, refer to the included LAN cable so that a cable of necessary length and material may be used.
💡 Hint	A jumper pin and A-to-MicroB type USB cable are required for image update (Flash). This cable is not included. We provide a sample jumper pin. If you require a jumper pin, please contact the shop where you purchased this product, or contact us directly.

3 Component Names and Functions

Or

Wi-Fi antenna

The device can be used via Wi-Fi. Please refer to 7: Network Settings" for more information on how to set up Wi-Fi.

LTE antenna

LTE communication may be used via a SIM card (standard size). Please refer to 7: Network Settings" for more information on how to set
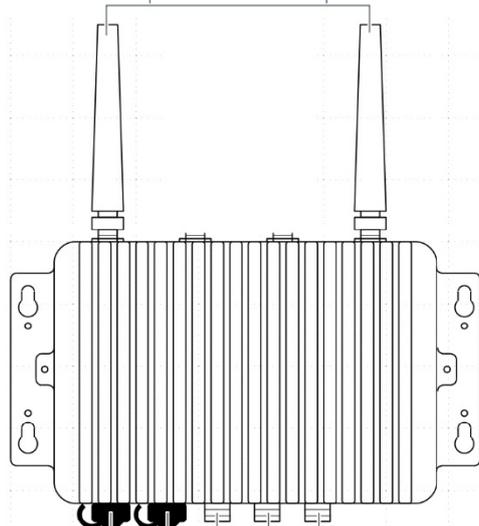
HDMI Connector

Connects to an HDMI-compatible monitor.

Power connector

Connect the included power cord.

USB 3.1 connector

Used for connecting external devices such as keyboards, mice, or sensors. Please use a hub if connecting a large number of devices.

Ethernet Connector (ETH)

Connects to an IP camera or other such device. Please refer to "6: Connecting Cameras" for information on how to connect a camera.

* ETH is compliant with PoE and IEEE802.3at 30 W standards.

Unused

*Above indicates attachment of included antenna.

4 Peripheral Device Connectivity

4.1 Peripheral devices that can be connected

The following peripheral devices can be connected to the Edge AI Box. Peripheral devices are supplied by the user.
- LAN cable
- Keyboard and mouse
- USB hub
- HDMI-compatible monitor
- HDMI cable

> **LAN cables**
> If using the outdoor type device, please use the included LAN cable with special waterproof connectors.
>
> **Hint**

4.2 Connection

1 **A keyboard and mouse can be connected to the Edge AI Box USB connector via a USB hub.**

2 **A monitor can be connected to the Edge AI Box via the HDMI connector.**

<Connection example>

To Be Updated

3 **The AC adapter/power cord plugs into a wall outlet.**
After starting up the Edge AI Box, the Ubuntu login screen will appear.
*1   There is no power switch.
*2   It may take several seconds for the Ubuntu login screen to appear. Please be patient, and do not turn off the power.

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<div style="border: 1px solid gray; padding: 10px;">

5 Login

</div>

When connecting peripheral devices to the Edge AI Box, the monitor, mouse, keyboard, or other device will become enabled.

After starting up the Edge AI Box, the Ubuntu login screen will appear. Log in to Ubuntu in order to operate the Edge AI Box.

1 **Click "nvidia".**

The password entry screen will appear.
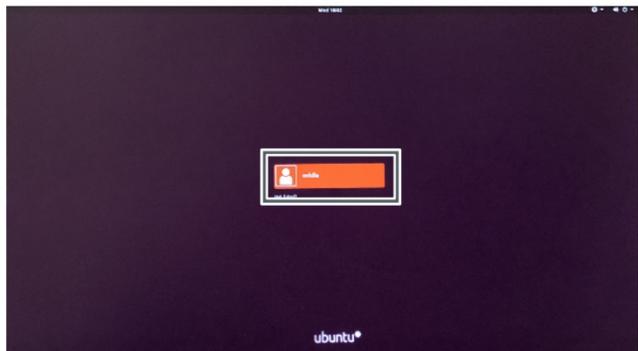
2 **Enter "nvidia" in the password field and then click "Sign in".**

Ubuntu will then login and the desktop will appear.
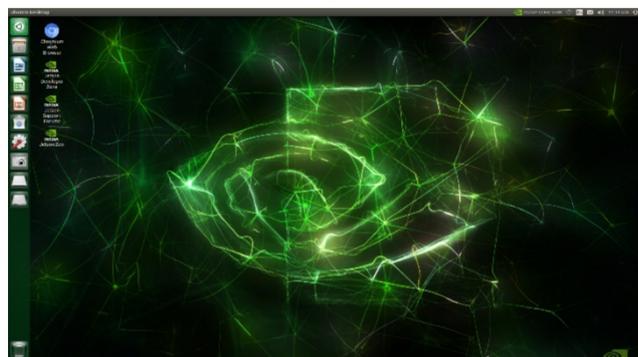
> ⚠ **Notice**
>
> For security, please change your Ubuntu password after logging in.

6 Connecting Cameras

6.1 Recommended cameras

- IP cameras
  The ethernet connector is compatible with IEE802.3at PoE. Please use PoE cameras rated at 30 W or lower.

> **Hint**
> When using a USB 2.0/3.0 or GigE camera, Ubuntu-specific drivers will be required. Please refer to the specific camera regarding driver details.

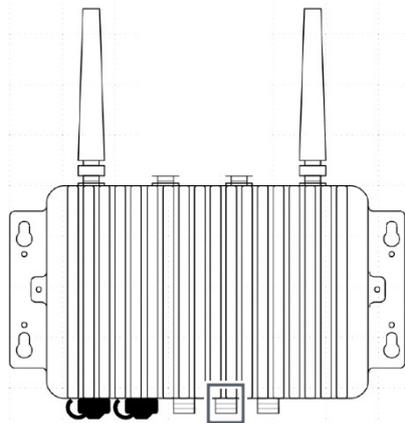> **Notice**
> - It is recommended that you avoid using USB cameras, as they are not waterproof.

6.2 Connecting cameras

Cameras can be connected to the Edge AI Box via the ethernet connector.

> **Hint**
> - When connecting an IP camera, confirm the camera's IP address beforehand. Also be sure to check the Edge AI BOX IP address as well.
> - If using a PoE-compatible IP camera, connect it using an ethernet connector.
> - For details on camera settings and driver installation, please refer to the instruction manual included with the camera.

7 Network Settings

7.1 Preparing the connectivity environment

The following communication environments may be used with this device. The user must set up each connectivity environment.
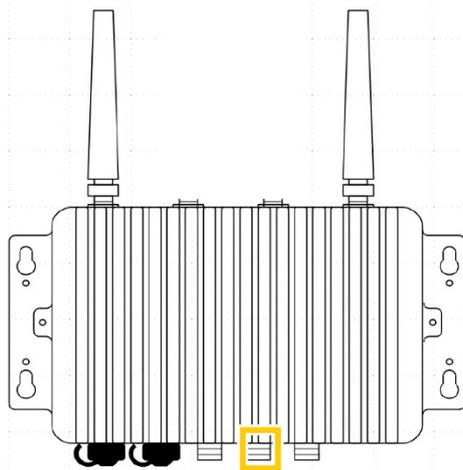
> The Edge AI BOX can connect to 2 or more ethernet, Wi-Fi, or LTE networks. When using 2 or more networks, we recommend using silent routing. Routing can prevent IP packets from degrading.
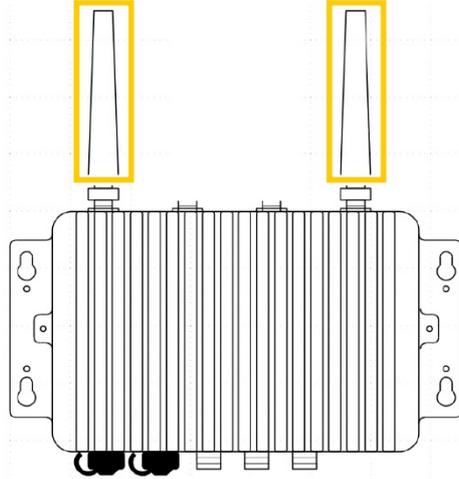>
> **Hint**

7.1.1 Ethernet

An ethernet connector can be connected to the Edge AI Box via a LAN cable.
*The LAN is 1000BASE-T.

7.1.2 Wi-Fi

Connect the included Wi-Fi antenna to the Edge AI Box Wi-Fi antenna connector.
Install a router compatible with IEEE 802.11a/b/g/n/ac dual-band 2x2 MIMO standards.

7.1.3 LTE

The following LTE SIM providers may be used in addition to the EDGEMATRIX SIM (MVNO using the NTT docomo network) with the Edge AI Box.
*   NTT docomo
*   au
*   SoftBank (As of January 2021, IoT functionality is still not recognized. Please check with our company if you wish to use this service.)

⚠ **Notice**

SIM card
*   The Edge AI Box uses a standard SIM card. A converter card may be required if you use a microSIM or nanoSIM card.
*   Please refer to the instruction manual that came with your SIM card for a detailed explanation of SIM card settings.

SIM card insertion
*   Be sure to turn off the Edge AI Box and ensure that it is placed on a stable surface prior to inserting a SIM card.
*   Do not touch the IC portion of the SIM card.
*   Be careful not to bend, crush, or otherwise damage the SIM card.
*   LTE cannot be used unless the SIM card is securely inserted into the LTE module.

Body SAR

The Edge AI Box does not comply with Body SAR specifications. Please use with the antenna placed at least 20cm from human bodies.

Body SAR regulations apply to devices with antennas placed within 20cm of human bodies.

National guidelines on technical standards for electromagnetic radiation absorbed by the human body, as well as international guidelines on electromagnetic radiation exposure prevention, must be followed.

Such international guidelines include those held by the World Health Organization (WHO), of which permitted values have been determined to be sufficiently safe regardless of the age or health status of the user.

SAR (Specific Absorption Rate) reflects the permitted level of electromagnetic radiation exposure proposed by national laws and international guidelines, and is expressed as the average electromagnetic energy

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allowed to be absorbed by the human body. The local SAR value is 2.0W/kg (excluding the region distal of the wrists and ankles, with is 4.0W/kg.)

Please refer to the following website for more details on Body SAR.

Telecommunications Bureau of the Ministry of Internal Affairs and Communications

http://www.tele.soumu.go.jp/j/sys/ele/index.htm

SIM card insertion

SIM cards are inserted into the Edge AI Box LTE module.

⚠ Notice	Please contact us if you intend to insert a SIM card. If you are able to apply the torque necessary to tighten the lid yourself, please proceed while referencing section 9.1.3. If the lid is not tightened securely, IP67 weather-proofing specifications will not be met and subsequent damage will not fall under the terms of warranty.

| ⚠ Notice	You may insert a SIM card with referring the following procedure by yourself. Please notify that failures and issues caused by your errors may be out of warranty. EDGEMATRIX Toolkit Box and EDGEMATRIX Service Box covers may not be opened. If you need to open, please contact EDGEMATRIX before opening. If you open without any notice to EDGEMATRIX, the warranty may end.

⚠ Notice	LTE firmware may differ depending on the type of SIM card used. Upon powering on the Edge AI Box following SIM card insertion, a firmware update screen may appear. In such cases, avoiding activating the Edge AI Box during sleep mode and do not turn off the power. Moreover, do not disconnect the network while the firmware is updating.

Attaching the LTE antenna

Connect the included LTE antenna to the Edge AI Box LTE antenna connector.
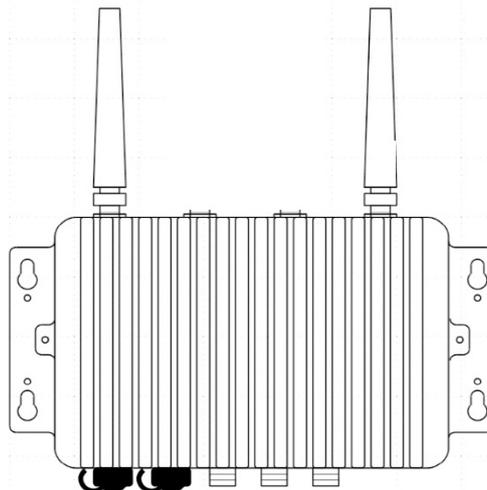
7.2 Network Settings

Use the System Settings function to set up the network.

1   **Click the System Settings icon.**
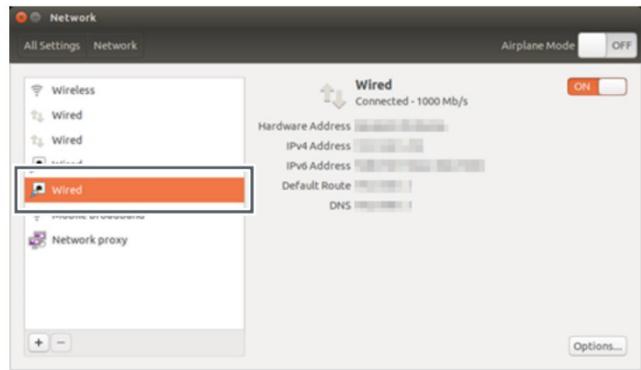   The System Settings screen will appear.

2   **Click the Network icon.**
       The Network screen will appear.

3 **If using ethernet, select Wired.**
Connection details will be shown on the right.
- If working in a DHCP environment, you can usually connect automatically using a LAN cable connection.
- Clicking Option will also allow you to set a fixed address.

If using Wi-Fi, select Wireless.
Access points will be shown on the right. Select your access point, then enter your password and other details to connect.
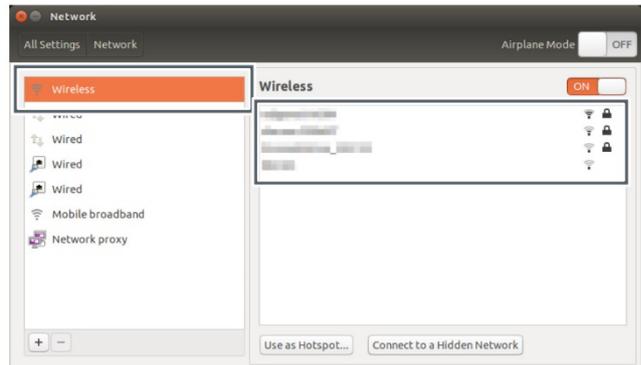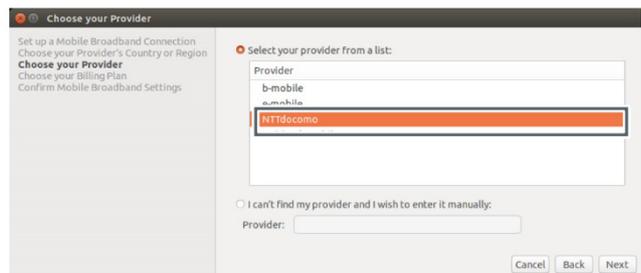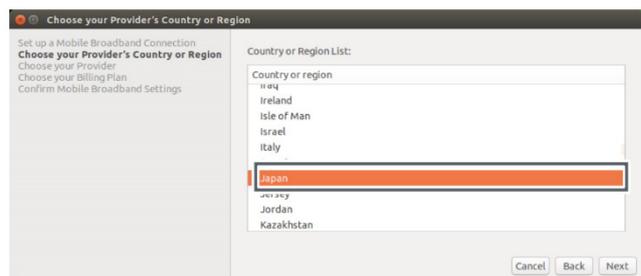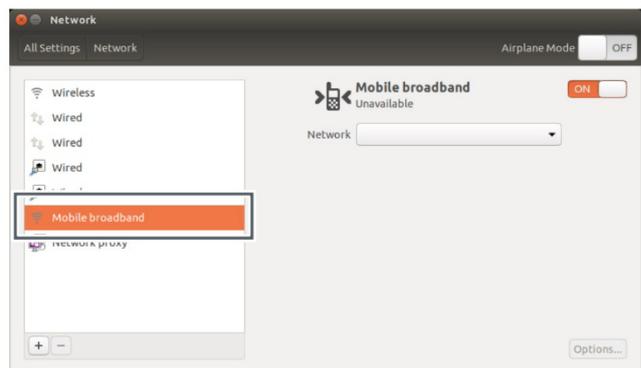
If using LTE, select Mobile Broadband and click Network.
The network settings screen will appear.
Click Next to set your country/region, provider, billing plan, APN, and other details in order.
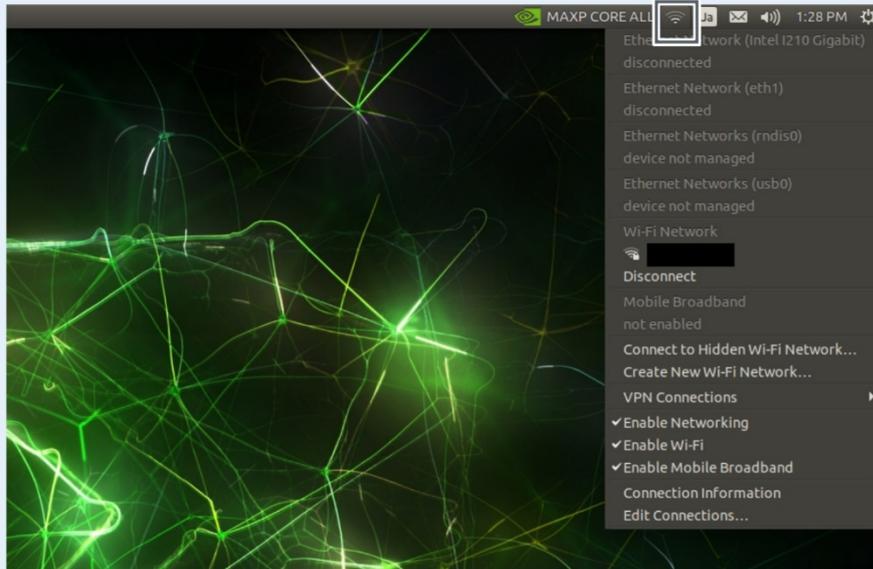- Clicking Option will also allow you to set an IP address.

Network settings from the network status icon
Click the network status icon on the upper right of the desktop to display network status. You can also set network elements here by clicking the different settings.

Hint

8 Edge AI Box Settings

Edge AI Box allows for various configurations in line with different user environments and goals.
This is an example of how to switch the keyboard language.

8.1 Switch keyboard language

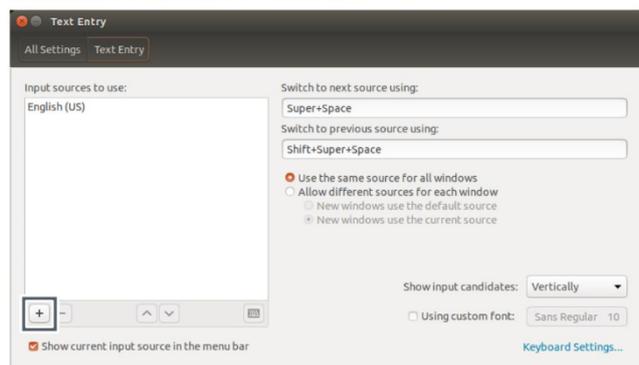Switch the keyboard language to Japanese so that the "_" and "|" characters can be used during command execution.

1   **Click the language icon to the upper right of the desktop, then click Text Entry Settings...**
The Text Entry screen will appear.

2   **Click the "+" icon.**
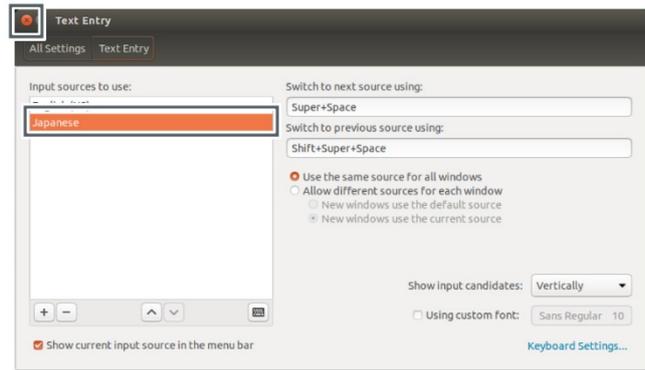The Choose an Input Source screen will appear.

3   **Scroll through the screen to select Japanese, then click Add.**
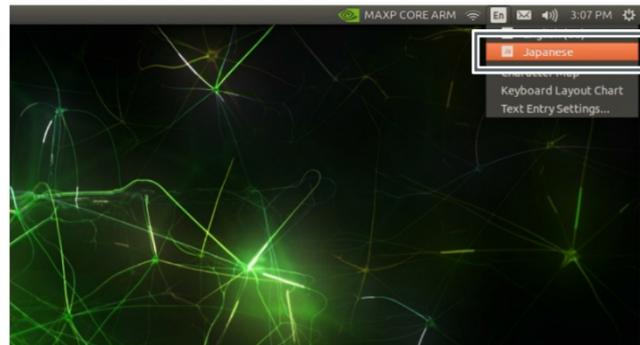Once Japanese language input is added, return to the Text Entry screen.

4   **Confirm that Japanese was added to the Text Entry screen, then click "x".**

5   **Click the language icon at the upper right of the desktop, then click Japanese.**

The keyboard input language has been changed to Japanese.

9 Image Update (Flash)

The Edge AI Box - NX Outdoor contains an NVIDIA Jetson Xavier NX, and an image containing NVIDIA JetPack drivers and other dependencies required for use on the Edge AI Box comes pre-installed. If a version of JetPack other than the pre-installed version is required, update the image (Flash) and install the NVIDIA Jetson SDK.
We provide several versions of NVIDIA JetPack that contain additional drivers. Please use the NVIDIA JetPack image file of your desired version downloaded from the Google Drive we have provided.

⚠ Notice

- The JetPack version provided by NVIDIA does not work properly with the Edge AI Box. Please download the image from us before flashing.
- The user is responsible for executing new commands after image update. Executing an incorrect command can damage the Edge AI Box image.
- In the unlikely event that a user-implemented update causes a system malfunction, our company shall bear no responsibility.
- This manual contains a description of the image update method for the indoor type version of this device. Please contact us if you plan to update an image for the outdoor type device.

9.1 Image Update (Flash)

9.1.1 Preparing to update

Required devices
The following devices are required to update an image.
- Host PC: Ubuntu 18.04.4
- USB cable: A to MicroB cable

■   **Download and decompress image file**

Download the image file from our company's Google Drive to the host PC, then decompress the image.

1   **Navigate to the following URL on your browser.**
       https://drive.google.com/drive/folders/1qgMZQbRcbAILAZNJ_dy8xJY91Sypl3CY?usp=sharing
       Google Drive will appear.

2   **Click the desired image file.**
       JPx.x in the file name refers to JetPack version x.x. The most recent version as of January 2021 is JP4.4.
       The download confirmation screen will appear.

3   **Click "download".**
       The download of the image file will begin.
       The downloaded image file will usually save to the "Downloads" folder.

Hint	• The image file is over 10 GB in size. This download may take some time depending on your internet connection. • Make sure that you have enough storage space for the file. The file will not successfully download if there is insufficient storage space. • Google Drive stores files using the MD5 hash. The has value can be confirmed using the "$ md5sum filename" command. If these values match, the download was completed successfully.

4   **Transfer the image file from the "Downloads" folder to the "Home" folder.**

5   **The file can then be decompressed using the following command.**
       $ sudo tar -xpf imagefile.tar.gz
       The downloaded image file will then be decompressed.

Notice	• Do not decompress by double-clicking the image file. This will not decompress the file correctly. • Approx. 50 GB of space will be required for the decompressed file. If insufficient storage space is available, decompression will not take place. • Please enter the commands correctly. If a command is entered incorrectly, the file will not be properly decompressed. Moreover, the Edge AI Box GUI may not function properly after updating the image.

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9.1.2 Executing an update (Flash)

Connect the Edge AI Box to the host PC containing the decompressed image file, then perform an image update (Flash) on the Edge AI Box.

> **Hint**
> You can perform an update by opening the rear lid. However, use caution when opening and closing the rear lid. Please refer to "8.2.3 Opening and Closing the Outdoor Type Device Rear Lid" for more details.

1   **Remove the screws (4 locations) from the rear lid of the Edge AI Box, then open the lid.**
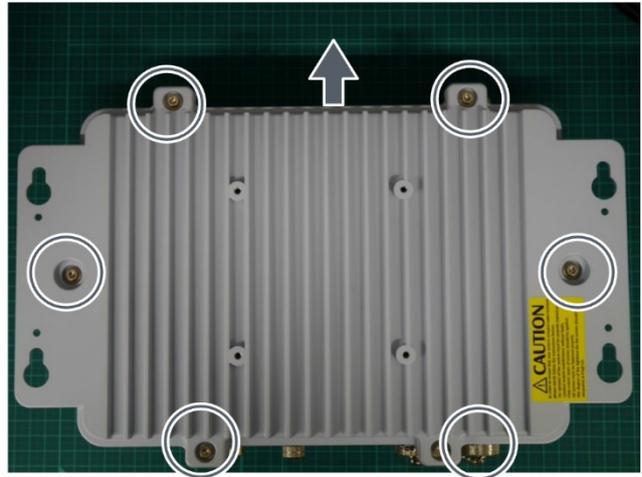
2   **Connect the MicroB connector end of the USB cable to the indicated socket in the Edge AI Box.**

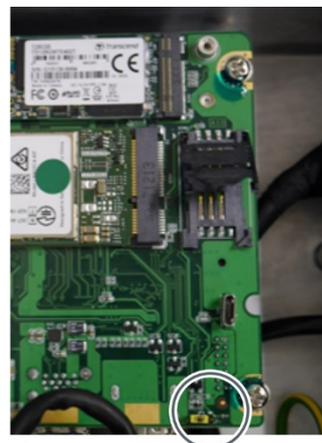**3**   **Connect the Type A connector end of the USB connector to the host PC.**

Connect to the host PC

4   **Run the command "$ lsusb" on the host PC, and ensure that "nVidia" is not displayed in the device list.**

5   **Insert the yellow jumper pin into position 1.**
   *   The jumper pin is for creating a short between pins.

6　　**Connect the AC adapter to the Edge AI Box power connector.**

7　　**The AC adapter power cord plugs into a wall outlet.**
　　　　The device will start up automatically. Once the screws have been re-inserted, wait about 1 minute and then insert the power plug.
　　　　If you do not wait a moment, the device may not start up due to internal electrical discharge.

8　　**Three or more seconds after the Edge AI Box powers on, insert the yellow jumper pin to position 3.**
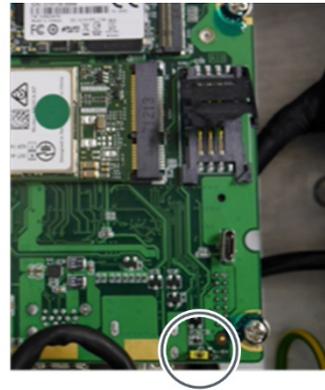
9　　**Run the command "$ lsusb" again on the host PC, and ensure that "nVidia" is displayed in the device list.**

10　**Run the command "$ cd Linux_for_Tegra" on the host PC.**
　　　　Move to the Linux_for_Tegra folder.

11　**Next, run the command "$ sudo ./flash.sh -r jetson-xavier-nx-devkit-emmc Mmcblk0p1" on the host PC.**
　　　　Image Update (Flash) will begin. Once the update is complete, Linux (L4T) will automatically boot up on the Edge AI Box.

　　　　*1 Update (Flash) will take about 30 minutes.
　　　　*2 It may take several seconds before the Linux bootup text appears. During this time, do not turn off the power to the device.
　　　　*3 The time it takes for the bootup text to appear may vary depending on the monitoring environment or other factors.

⚠ **Notice**　　Copy-pasting commands from this text may result in the insertion of unintended code and subsequent incorrect execution. This in turn may cause damage to Edge AI Box. It is recommended that commands be entered by hand exactly as shown here.

9.1.3 Opening and Closing the Outdoor Type Device Rear Lid

When closing and opening the outdoor type device rear lid, please tighten the hexagonal socket and N jack connector using the indicated amount of torque in order to maintain the dust- and water-proofing qualities of the device.

Hexagonal socket screws

The hexagonal socket screws are located in the positions indicated below. Tightening requires 7.5kgf of torque.
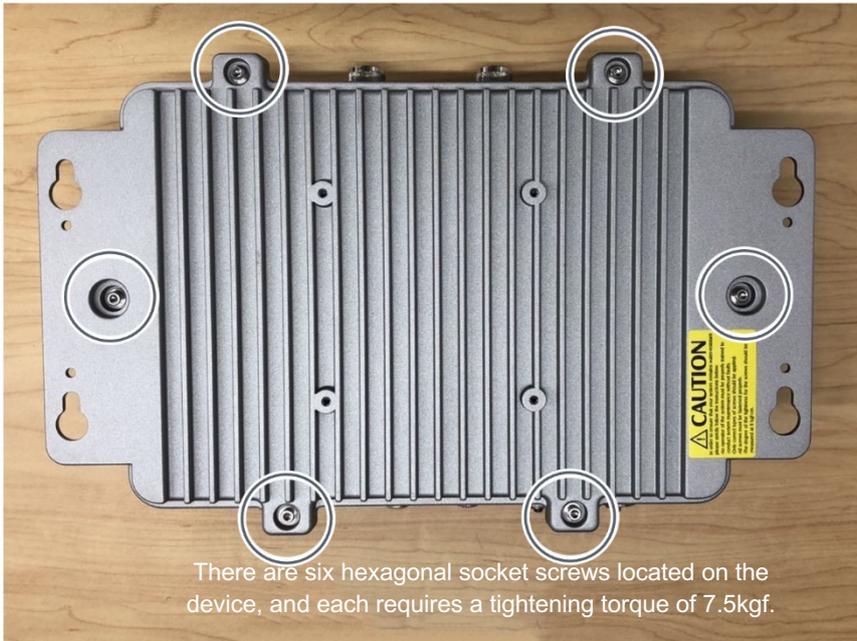
N jack connector

The N jack connector is located in the position indicated below. Tightening this connector requires 10kgf of torque.

Upper portion (for antenna)   Lower portion

⚠ Notice	• If not tightened using the indicated amount of torque, dust- and water-proofing cannot be guaranteed. If the screws are not properly tightened, the warranty may be invalidated even if the product is within the warranty period. • We provide update (Flash) and SIM insertion services for the outdoor type device. Please contact us if you require such services.

9.2 NVIDIA JetPack SDK Installation

After updating the image, use the network SSH connection to install the NVIDIA JetPack SDK on the Edge AI Box.

9.2.1 Check Edge AI Box IP Address

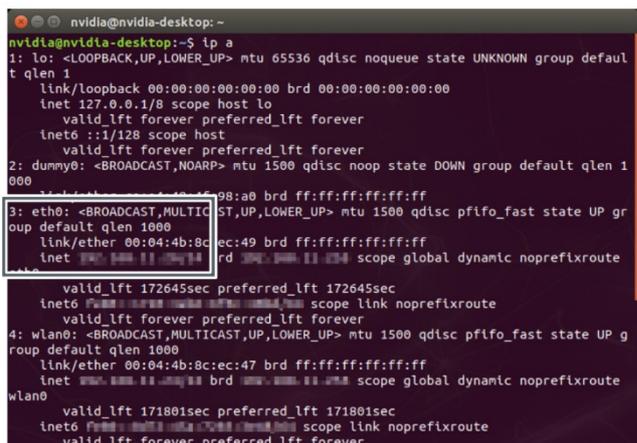Before installing the NVIDIA JetPack SDK, check the Edge AI Box IP address.

1   **Turn on the Edge AI Box and log in.**

2   **The Edge AI Box should be connected to the same network segment as the host PC.**

3   **You can check the Edge AI Box IP address using one of the following methods.**

• Click the network status icon on the upper right of the screen, then click Connection Information.

The Connection Information screen will appear, allowing you to check the IP address.
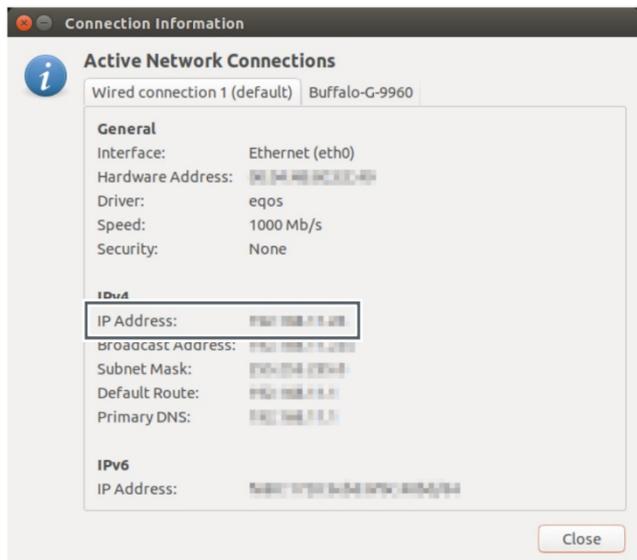

• Run the "$ ip a" or "$ ifconfig" commands.

9.2.2 NVIDIA JetPack SDK Installation (via host PC)

Install the NVIDIA JetPack SDK to the Edge AI Box using the host PC.

1   **When you login to NVIDIA DEVELOPER, the NVIDIA SDK Manager screen will appear.**

2   **Click NVIDIA SDK Manager and follow the screen prompt to install the NVIDIA SDK Manager.**

3   **Open the NVIDIA SDK Manager.**
The login screen will appear.

4   **Enter your NVIDIA DEVELOPER ID (email address) and password, then click LOGIN.**
The SDK Manager will appear.

**5**   **Click Target Hardware, then select "Jetson Xavier NX".**
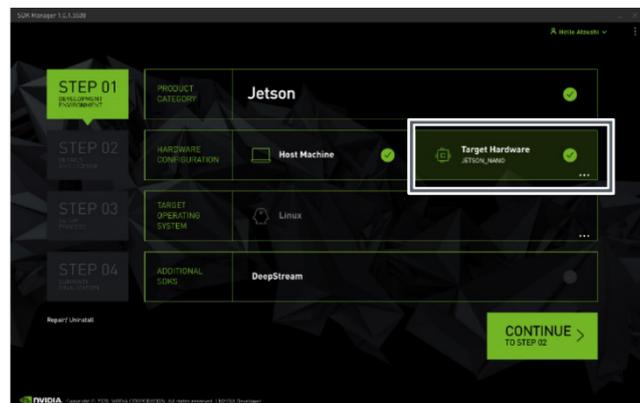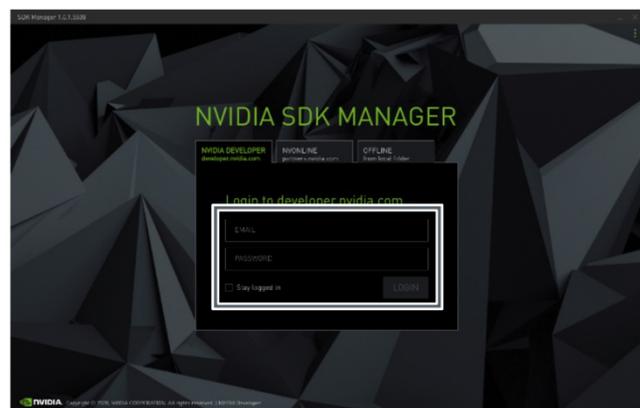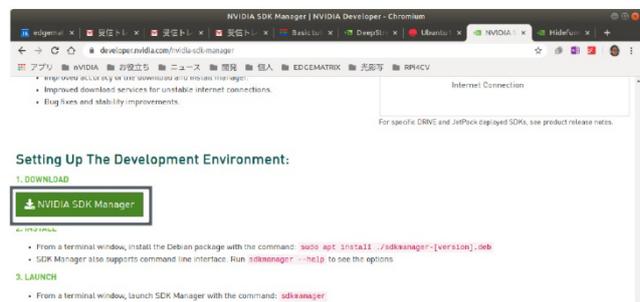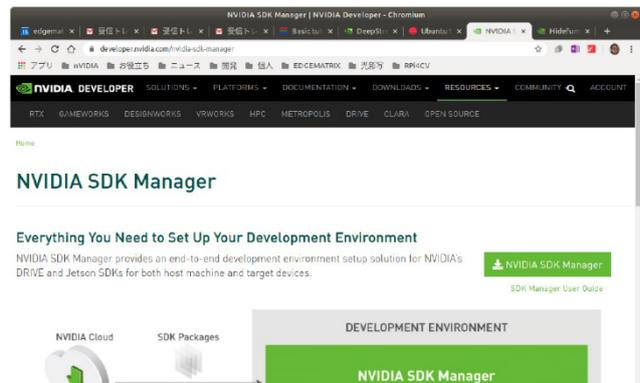
6 **Select the JetPack Image downloaded via your TARGET OPERATING SYSTEM. Click Continue.**
Continue to Step 2.
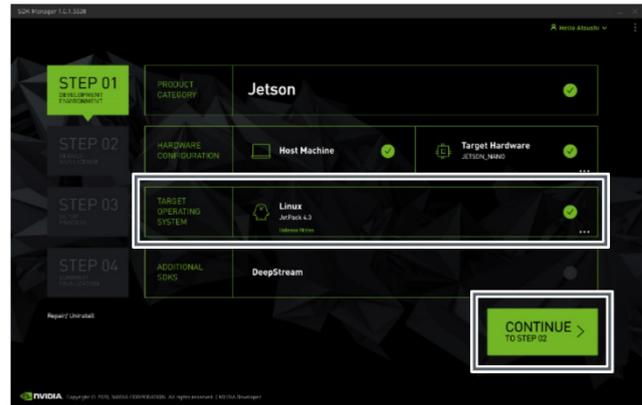
7 **Set the following parameters, then click CONTINUE.**
- **Remove the check mark on TARGET COMPONENTS under Jetson OS.**
- Check the TARGET COMPONENTS under Jetson SDK Components.
- Check "I accept the terms and conditions of the License agreements."
The password entry screen will appear.
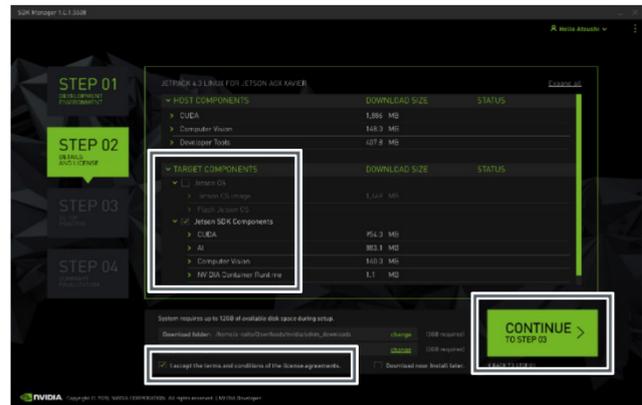
**8** **Enter the password of the host PC, then click OK.**
Download and installation of the NVIDIA SDK Manager will begin.
As the installation proceeds, screens will appear for entering the Edge AI Box IP address, ID, and password.
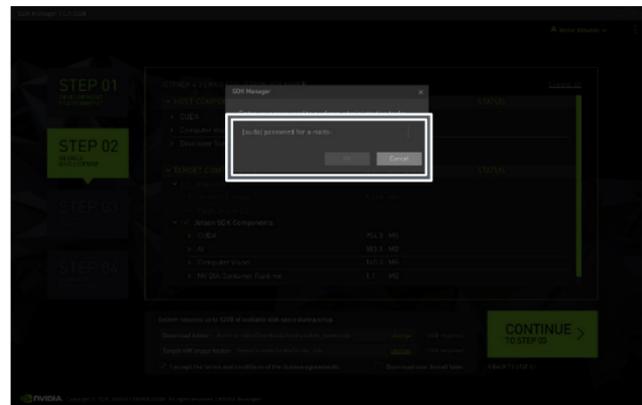
9 **Enter the following information, then click Install.**
- IP Address: The IP address obtained in "9.2.1: Check Edge AI Box IP Address"
- Username: nvidia
- Password: the password set after logging into Ubuntu for the first time (initial password: "nvidia")
The NVIDIA SDK Manager will install on the Edge AI BOX - NX Outdoor.
Continue with Step 04 after installing the NVIDIA SDK Manager.
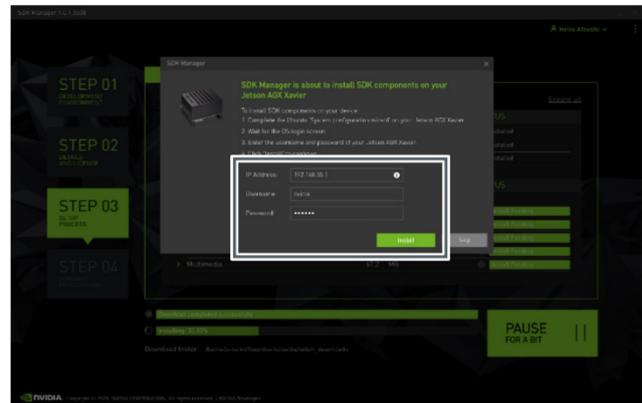
10 **Click "Finish".**
NVIDIA SDK Manager installation is complete.

10 Create an image clone

Creating an image clone will allow you to recover if a problem arises, and enables you to update (Flash) another Edge AI Box using the cloned image for configuration under the same environment.
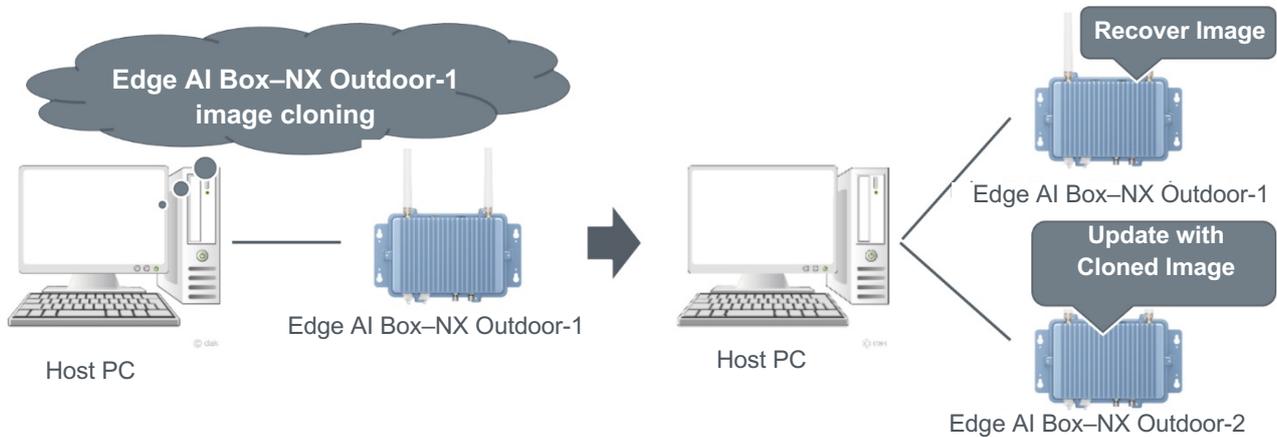
10.1 Create an image clone

Decompress the image to the host PC following the instructions in Section 10.1.1. Connect the host PC to the Edge AI Box using an A-to-MicroB type USB cable. Then, overwrite the host PC image file as an Edge AI Box clone.
Refer to "8.2.2: Executing an update (Flash)" for instructions on how to connect the Edge AI Box to the host PC.

> ⚠ **Notice**
> In order to recover from any issues that may arise during the cloning process, execute the following command on the host PC prior to cloning to save an image file (system.img).
> sudo cp <L4T>/bootloader/system.img <L4T>/bootloader/system.img.save
> *<L4T> refers to the folder containing the decompressed image file (tar).

1 **Execute the following command on the host PC.**
   cd <L4T>
   sudo ./flash.sh -r jetson-xavier-nx-devkit-emmc mmcblk0p1
   A "clone.img" and "clone.raw" file will both be created in <L4T> on the host PC.

2 **Execute the following command on the host PC.**
   sudo cp clone.img bootloader/system.img
   The "system.img" file will be overwritten by the "clone.img" file in <L4T> on the host PC.
   The overwriting process will then allow Edge AI Box to be updated (Flashed) using the clone image.

> ⚠ **Notice**
> Copy-pasting commands from this text may result in the insertion of unintended code and subsequent incorrect execution. This in turn may cause damage to Edge AI Box. It is recommended that commands be entered by hand exactly as shown here.

10.2 Clone Update

Connect the host PC containing the created clone file to the Edge AI Box you wish to update (Flash) with the clone by using an A-to-MicroB type USB cable. Then, update the image.
Refer to "8.2.2: Executing an update (Flash)" on how to update an image.

|	
⚠️ Notice	If a new package requires updating, use the apt command or other method to perform the upgrade. The user is responsible for executing upgrades correctly. If a malfunction results from performing an upgrade, our company shall not be held responsible. In such cases, repairs may require an additional fee even if the device is still under warranty.

11 Turning Off the Edge AI Box

When you finish using the Edge AI Box, shut down Ubuntu and turn off the power.

1   **Click "⚙" at the upper right of the desktop, then click Shut Down...**
The Shut Down screen will appear.
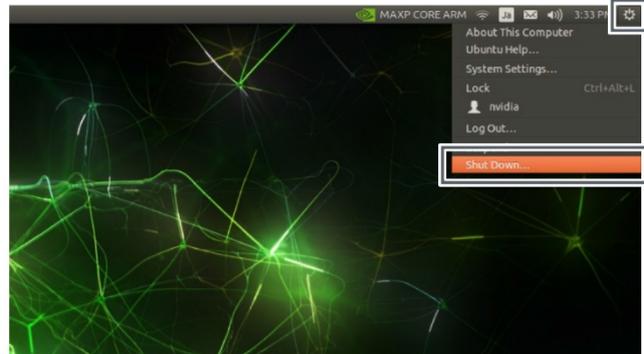
2   **Click Shut Down.**
Ubuntu will shut down, then the Edge AI Box will power off.
*   Click Restart to reboot the Edge AI Box.

12 Base Specifications

12.1 Base Specifications

OS	L4T (compatible with Ubuntu 18.04) NVIDIA JetPack 4.4 compatible Libraries * IO drivers are included with the Edge AI Box.

JETSON Xavier NX	Processor	GPU NVIDIA Volta 384 CUDA cores
	CPU	Carmel ARMv8 (64-bit) HMP CPU
	Memory	8GB 128-bit LPDDR4 @1600MHz
	Storage	16GB eMMC (8bit, 200MHz (HS400))
	HDMI	HDMI 2.0 type-A (1080p60) by C3-HDMI (limited by C3-HDMI)
	USB	USB3.1 gen1 type-A
	Network	1 x GbE PoE (IEEE802.3at 30W) M12 X-code w/ 10KV SPD

Expanded Storage	SSD 128GB M.2 (2242) PCIe 2.0 x 2	
LTE	LTE	docomo/au/softbank (undergoing compatibility restructuring as of January 2021)
	LTE signal speed	Download: 100 Mbps / Upload: 50 Mbps
	3G	docomo/au/softbank (undergoing compatibility restructuring as of January 2021)
	3G signal speed	Download: 42 Mbps / Upload: 5.76 Mbps
	Control commands	AT commands
PoE (outdoor type box only)	IEEE802.3at 30W	
Power	100～240V	
Power consumption	7.5W (Max-Q) / 15W (Max-P)	
Operational temperature range	-30～+50°C	
Operational humidity range	10 to 95% (avoid condensation)	
Vibration	3Grms w/M.2 (5～500Hz, X, Y, Z)	
Outer Dimensions (width x height x depth)	366.83mm(14.44")(W) x 83mm(3.27")(D) x 210mm(8.27")(H)	
Weight	4.31 Kg (9.5 lb)	

12.2 CE Conformity :

CE

Items	Maximum radio-frequency power	
WCDMA	WCDMA I (1922.4~1977.6 MHz)	22.74(dBm)
	WCDMA VIII (882.4~912.6 MHz)	23.03(dBm)
LTE	Band 1 (1922.5 ~ 1977.5 MHz)	23.15(dBm)
	Band 3 (1710.7 ~ 1784.3 MHz)	23.18(dBm)
	Band 8 (880.7 ~ 914.3 MHz)	23.04(dBm)
	Band 28 (704.5 ~ 746.5 MHz)	23.2(dBm)

This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

DoC Download :
https://service.edgematrix.com/public/pdf/EU_DeclarationOfConformity(RED)_EHC-JNX-551-L.pdf

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