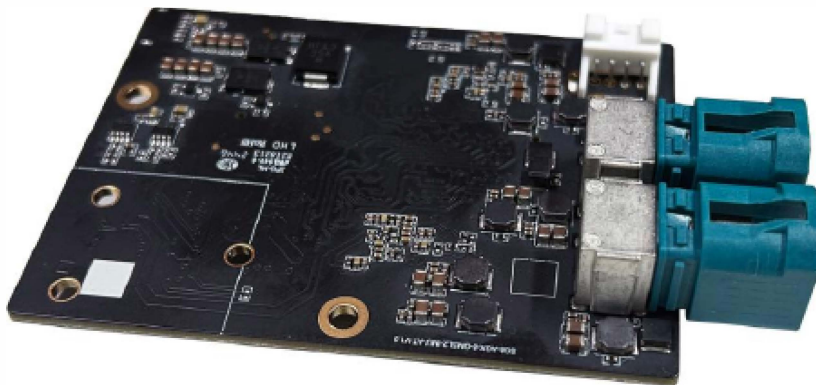


User manual

JY8A-AGON-G2Y-Ax



Version 1.0

Disclaimers

SENSING reserves the right to edit/modify this document without any prior notice.

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Document revision history

Rev	Date	Description	Author
V1.0	2025/06/16	Initial release	

Safety warning and use precautions

- **Safety statement**

Before using this product, you must read this document to have a preliminary understanding of the product, and follow the safety instructions in this product manual to ensure your personal safety and avoid damage to the equipment. If blind operation causes loss or injury, the manufacturer shall not be responsible for any problems caused by its wrong operation of the equipment and personal life and property safety.

- **Supply voltage**

Converter board input power supply: 12V DC; Current: above 3A.

- **Environmental requirement**

Operating temperature: -20°C -70°C.

Ventilation requirements: There must be good conditions around the installation of the computing platform.

- **Grounding requirement**

The power supply of the power adapter must be properly grounded. In special scenarios, a ground screw must be installed to connect the power adapter to the ground.

- **Electrostatic protection**

Electronic components and circuits are very sensitive to electrostatic discharge, although the company will design the main interface on the board card to do anti-static protection design, but it is difficult to do anti-static safety protection for all components and circuits. Therefore, it is recommended that you take ESD safety measures when handling any circuit board component. ESD safety measures include, but are not limited to, the following:

- ◆ During transportation and storage, place the box in an ESD bag. Do not take the conversion board until installation and deployment;
- ◆ Release the static electricity stored in the body before touching the box: Wear a wrist strap with a grounding discharge;
- ◆ Operate the box only in a safe electrostatic discharge area;
- ◆ Avoid moving boxes in carpeted areas.

Noun parsing

POC	Power Over Coax
GMSL	Gigabit Multimedia Serial Links
FPDLINK	Flat Panel Display Link
SerDes	Serializer and Deserializer
D-PHY	The original version of the MIPI D-PHY was designed to target 500Mbps/s, with D being the Roman numeral (Latin numeral) for 500. In the same way, C and M are the Roman numerals 100 and 1000 respectively, which is the C and M in C-PHY and M-PHY
C-PHY	C-PHYs may be used in channel-limited applications, hence the use of the character. "C", 3-Phase symbol encoding technique, Each symbol can transmit 2.28bits of data, using base 5 transmission, and the efficiency is 2.27 times that of D-PHY

Chapter 1 Introduction to SG8A-AGON-G2Y-A1 adapter board

SG8A-AGON-G2Y-A1 adapter board, its MIPI interface according to the standard NVIDIA standard 120Pin interface design, can be compatible with official and customer design and development board.

The design has two 4*1Mini FAKRA interfaces, which can access up to 8 cameras and support different types of GMSL cameras. The switch board can adapt to work in different frequencies, that is, it is compatible with GMSL1 and GMSL2 protocol interfaces through software configuration. The Power supply of GMSL camera is provided by PoC (Power over Coax), so all data, control signals and power are sent through a 50 Ω coaxial cable. This makes the camera's cable wiring flexible and easy to install in automotive applications.

1.1 SG8A-AGON-G2Y-A1 adapter board function

- Compatible with official kits
Supports the NVIDIA Jetson AGX Orin/Xavier development suite
- Compatible with different versions of the NVIDIA JetPack SDK
Jetpack5.1.2, L4T r35.4.1 and later versions
- Supports up to 8 GMSL cameras
Supports up to 8 channel 8MP YUV Camera
- Support synchronous trigger

Supports external trigger signals to achieve camera synchronization

- The maximum transmission distance of the camera is 15 meters

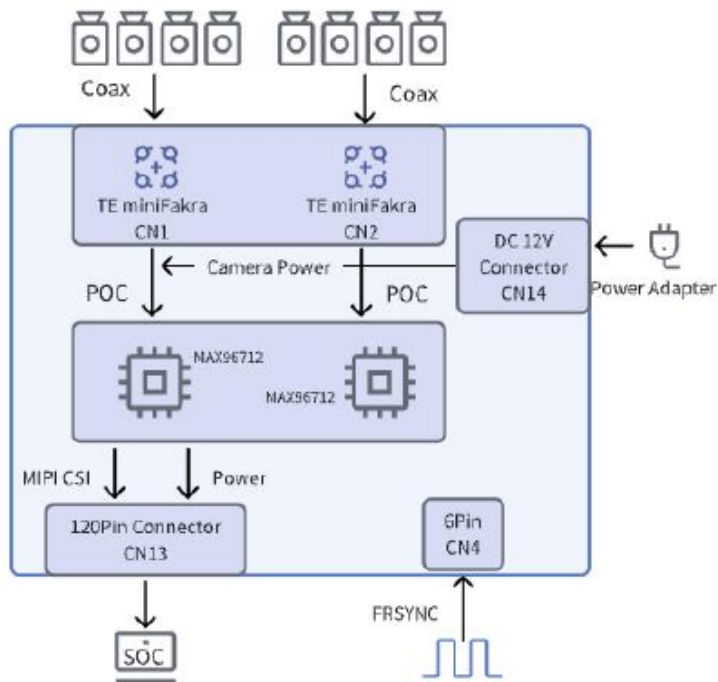
By using the GMSL protocol camera, it can support the long distance stable and reliable transmission of the camera, the longest distance supports 15 meters, which can be extended by using the Sensing Repeater

<https://www.sensing-world.com/gmsljzjq>

1.2 SG8A-AGON-G2Y-A1 adapter board specification

Model	SG8A-AGON-G2Y-A1
Dimension	86.9mm*55mm*21.8
Weight	50g
Connector	1x120Pin High-density connectors
Camera input	Camera*8(GMSL2/GMSL1)
Trigger In	6Pin Sync In
Deserializer	MAXIM(ADI) MAX96712*2
Camera Connector	Fakra Z Code
POC Power Supply	DC 9-16V
DC Power Supply	DC 12V
Operating Conditions	-20°C to +70°C
Adaptation kit	Jetson AGX Orin/Xavier

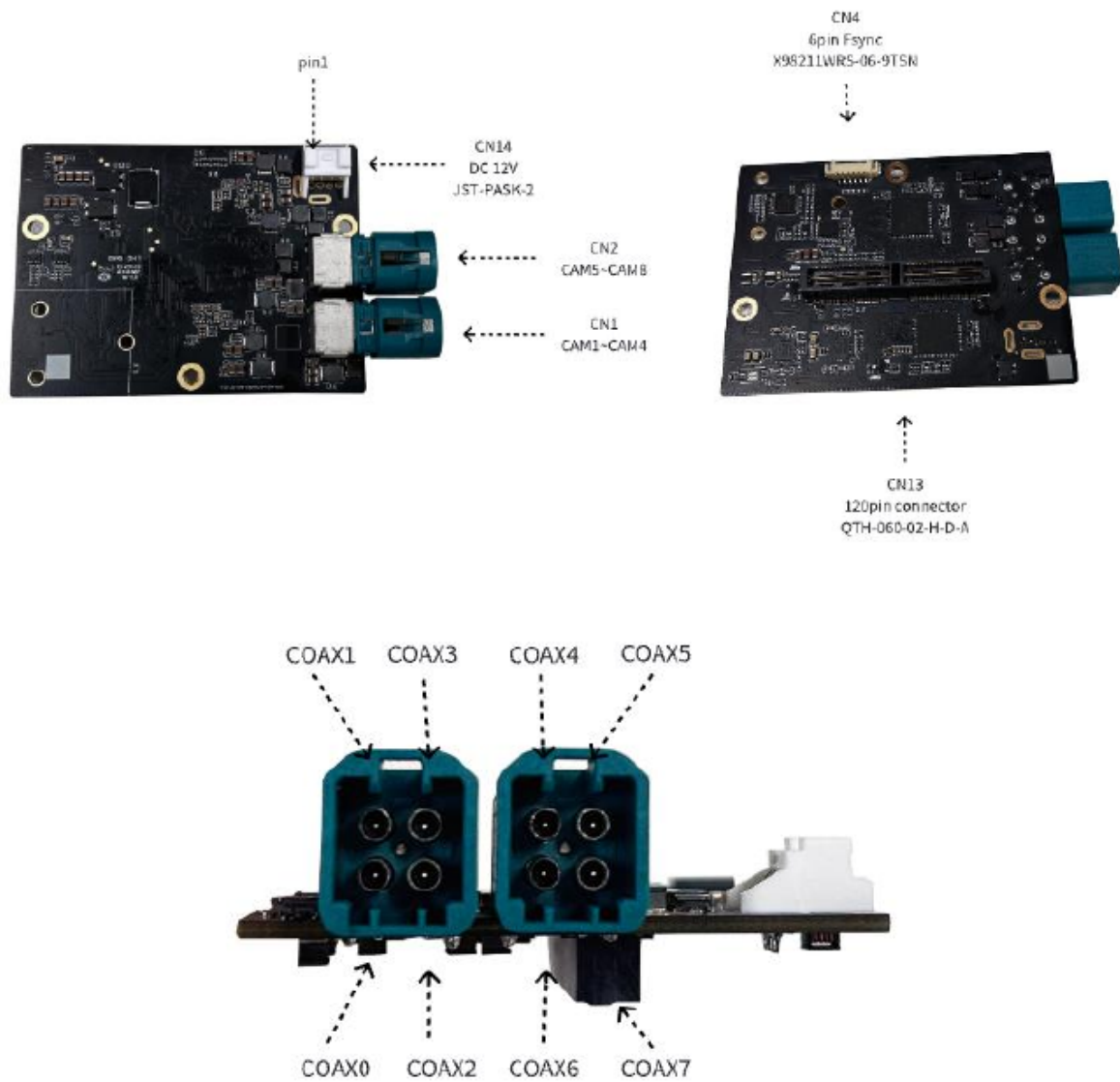
- Product block diagram



Attention:

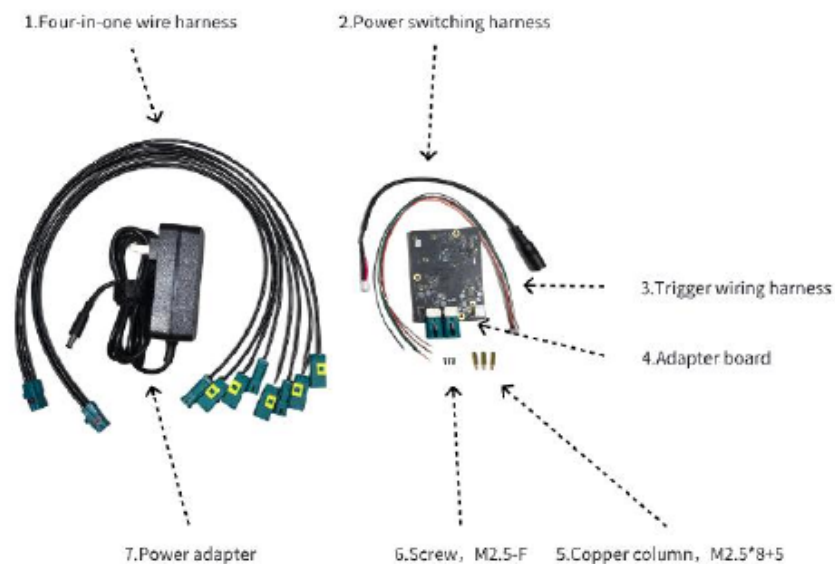
- (1) The I2C bus number is the hardware location. The bus number does not necessarily correspond to what is listed in the software.
- (2) The coaxial power supply is shared, but each GMSL line has its own filter.

- Adapter board interface diagram



1.3 SG8A-AGON-G2Y-A1 Adapter board attachment list

Parts list			
Serial number	Product model	quantity	remark
1	Four-in-one wire harness	2	Standard configuration
2	Power switching harness	1	Standard configuration
3	Trigger wiring harness	1	Standard configuration
4	Adapter board	1	Standard configuration
5	Copper column, M2.5*10	3	Standard configuration
6	Screw, M2.5-F	3	Standard configuration
7	Power adapter	1	Standard configuration
8	Jetson AGX Orin DK	1	optional configuration



Chapter 2 SG8A-AGON-G2Y-A1 Instructions for using the adapter board

Reference link to Nvidia's official website:

Software Setup

<https://developer.nvidia.com/embedded/learn/jetson-agx-orin-devkit-user-guide/two-ways-to-set-up-software.html>

To Flash the Jetson Developer Kit Operating Software

<https://docs.nvidia.com/jetson/archives/r35.1/DeveloperGuide/text/IN/QuickStart.html#to-flash-the-jetson-developer-kit-operating-software>

2.1 Product installation video

Please refer to the following video to install the SG8A-AGON-G2Y-A1 on the Jetson AGX Orin DK;

https://autosensee.feishu.cn/file/Q3ZfbgYNWo706Xpw49c39OMnNe?from=from_copylink

2.2 Product information

Product instructions and Q&A can be obtained through the following service platforms;

service.sensing-world.com



[Product Selection](#)
[Information Query](#)
[Repair](#)
[ISP Service](#)

Input information

SN Code

z: By entering the SN code, unique internal parameter data can be queried

Product Model

z: By entering the complete product model, all information except for internal parameters can be queried

Output Results

Product Manual(optional)

Structural 3D data(optional)

Module internal parameter data(optional)

SerDes configuration file(optional)

Sample image effect of the module(optional)

Guidance Documents(optional)

Instructions Links Q&A(optional)

2.3 Setting up the environment

The driver package for the SG8A-AGON-G2Y-A1 adapter board is developed on a specific Jetson Linux version and you need to make sure the Jetson Linux version matches before installing the driver. If it does not match, you need to re-flash the system, otherwise the system will not boot after installing the driver. NVIDIA Jetson

AGX Orin/Xavier supports two types of flashes using SDK Manager and Flash.sh script.

Preparation required:

- NVIDIA Jetson AGX Orin/Xavier Development Kit
- Computer with Ubuntu 18.04/20.04s 1
- USB TYPE-C data cable 1pc

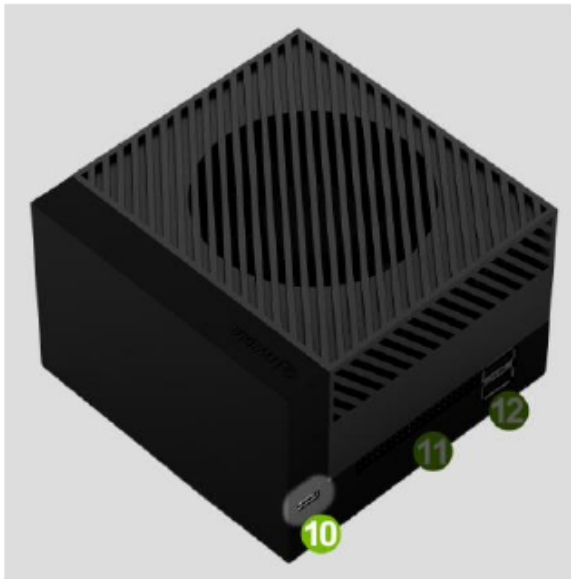
2.3.1 Set RECOVERY download mode

The Nvidia Jetson platform software is upgraded via the USB interface and the Jetson device needs to be put into Recovery mode before the upgrade can take place, which includes the Kernel Kernel, the file system RootFS, the JetPack SDK and more.

To enter Recovery download mode in the off state, proceed as follows:

(1) Connecting a USB TYPE-C cable

Use a USB TYPE-C cable to connect the Jetson device to the Ubuntu Host, with one end connected to the TYPE-C port of the Jetson device[®] and the other end connected to the USB port of the Ubuntu Host



(2) Press and hold the Force Recovery button at② and do not release it yet

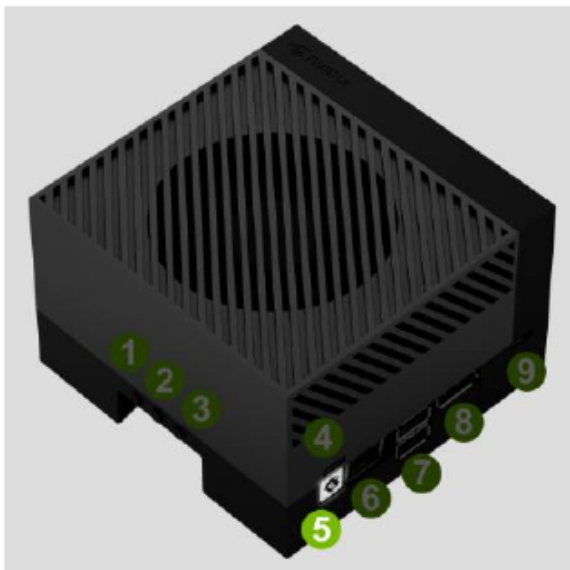


(3) Access to power

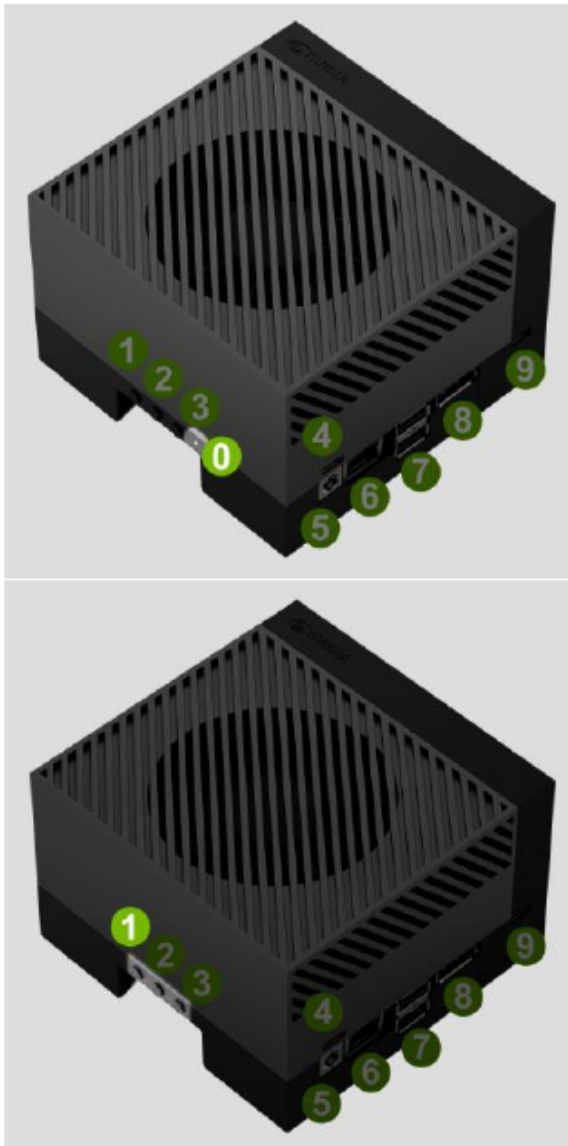
Can be connected to the power supply using the Type-C connector ④



Can also be connected to the power supply using the DC interface ④



- (4) If the white LED® does not light up, press and hold the power on button⑤ to switch on



(5) Wait for more than 5s and release all buttons to enter Recovery download mode

You can run the command `lsusb` on the Ubuntu Host to check for NVIDIA Corp. APX devices to confirm that the Jetson device has successfully entered Recovery download mode.

```
sensing@ubuntu:~$ lsusb
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 004: ID 0e0f:0002 VMware, Inc. Virtual USB Hub
Bus 003 Device 003: ID 0e0f:0002 VMware, Inc. Virtual USB Hub
Bus 003 Device 005: ID 0955:7023 NVIDIA Corp. APX
Bus 003 Device 002: ID 0e0f:0003 VMware, Inc. Virtual Mouse
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 002 Device 003: ID 0e0f:0002 VMware, Inc. Virtual USB Hub
Bus 002 Device 002: ID 0e0f:0008 VMware, Inc. Virtual Bluetooth Adapter
Bus 002 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
sensing@ubuntu:~$
```

2.3.2 Use the SDK Manager to brush your phone

(1) Download SDK Manager

Download the latest SDK Manager from the official website and select the .deb format for Ubuntu.

<https://developer.nvidia.com/nvidia-sdk-manager>

Once downloaded, copy it to the working directory of your Ubuntu Host and install it.

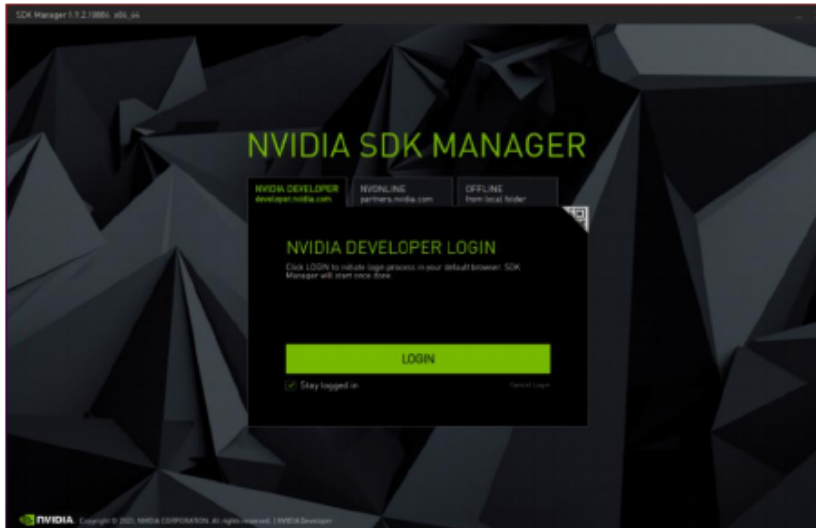
```
$ sudo apt install ./sdkmanager_1.9.2-10884_amd64.deb
```

(2) Run SDK Manager

Before running SDK Manager, please refer to section "2.1.1 Setting up RECOVERY download mode" to put the Jetson device into Recovery download mode. Find and click on the "SDKManager" icon in the application to run the SDK Manager, or run it from the terminal with the following command.

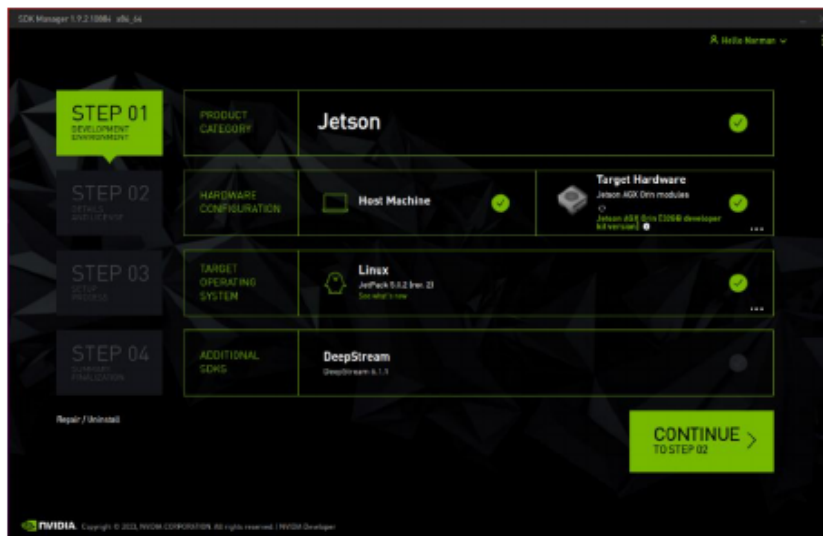
```
$ sdkmanager
```

Once launched, you will need to log in with your account, if you don't already have one, you can register for a developer account.



(3) Refresh

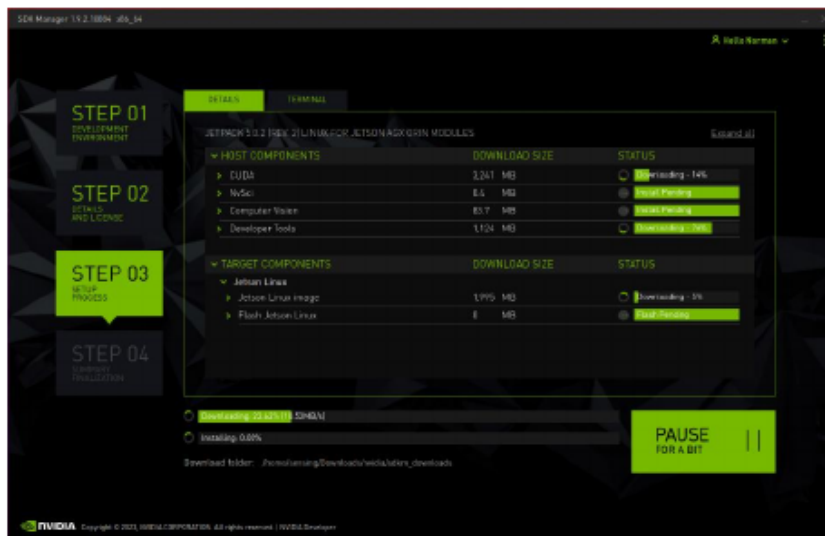
STEP 01: Automatically identify the Jetson device, select the JetPack version to match the Jetson Linux version required by the driver package, here JetPack 5.0.2 (Jetson Linux 35.1) is used as an example. Note that if there is no matching version, you need to use the Flash.sh script brushing method instead.



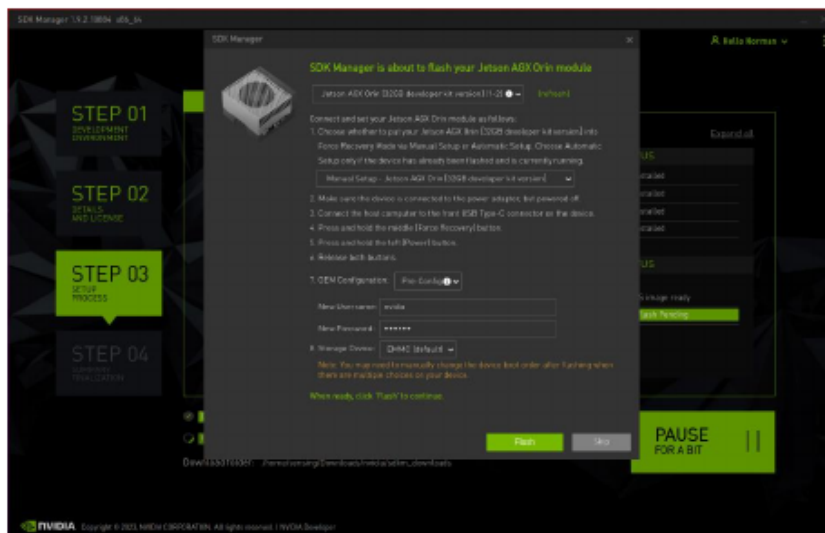
STEP 02: Select the components to be installed according to your needs

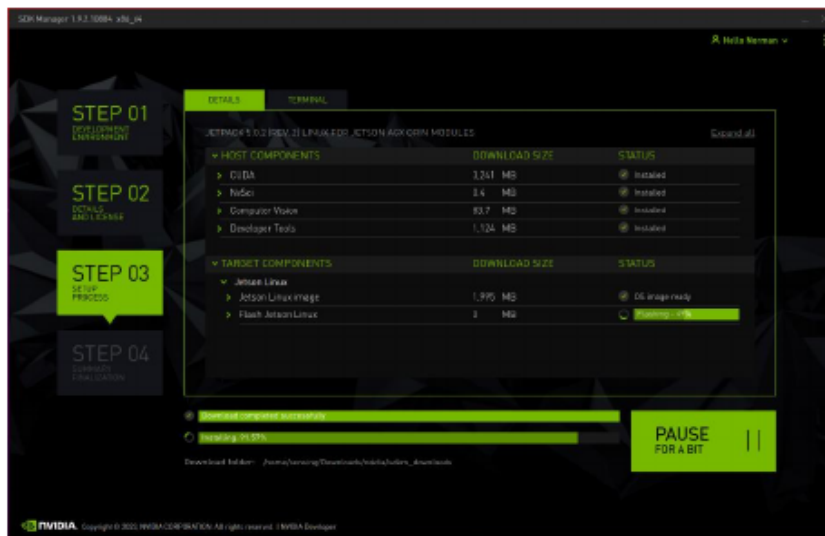


STEP 03: Download and Installation

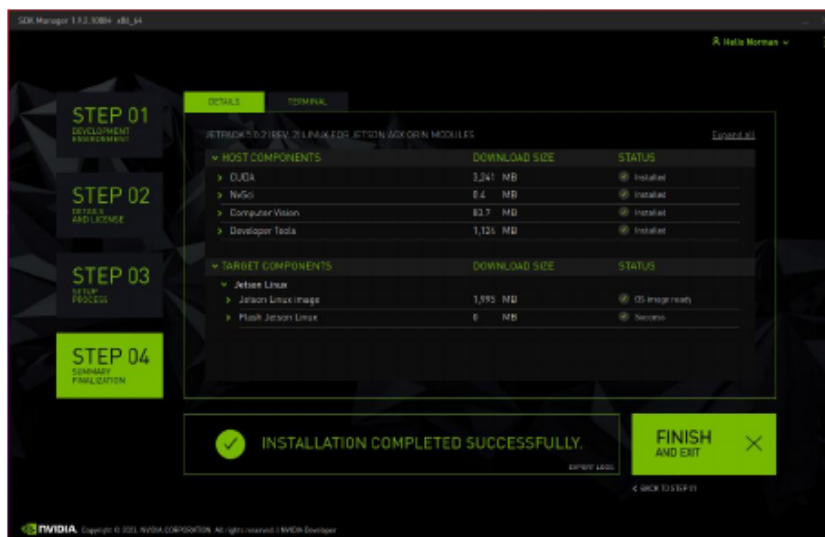


As the Jetson device is already in Recovery mode, here select Manual Setup, and set a new username and password.





STEP 04: Installation complete



Once the swipe is complete, the Jetson device automatically boots into the Linux desktop.

2.3.3 Use the flash.sh script to flush the machine

(1) Download the brush package

<https://developer.nvidia.com/embedded/jetson-linux>

Depending on the driver version, select the corresponding Jetson Linux version, here JetPack 5.0.2 (Jetson Linux 35.1) is used as an example.

Downloads and Links

	Jetson Orin modules and developer kit	Jetson Xavier modules and developer kits
DRIVERS	Driver Package (BSP)	
	Sample Root Filesystem	
SOURCES	Driver Package (BSP) Sources	
	Sample Root Filesystem Sources	
	Sensor Processing Engine Sources	
DOCS	Jetson AGX Orin Developer Kit User Guide	Jetson AGX Xavier Developer Kit User Guide Jetson AGX Xavier Platform Adaptation Guide
	Release Notes	
	Jetson Linux Developer Guide (online version) Jetson Linux Developer Guide (downloadable version)	
	Software License Agreement	
	Jetson Linux API Reference (formerly named Multimedia API Reference)	
	nvbuf_utils to NvUtils Migration Guide	

Click on Driver Package to download to get Jetson_Linux_R35.1.0_aarch64.tbz2

Click on Sample Root Filesystem to download

Tegra_Linux_Sample-Root-Filesystem_R35.1.0_aarch64.tbz2 and copy it to the working directory of your Ubuntu Host.

```
sensing@ubuntu:~/nvidia$ ls
Jetson_Linux_R35.1.0_aarch64.tbz2
Tegra_Linux_Sample-Root-Filesystem_R35.1.0_aarch64.tbz2
sensing@ubuntu:~/nvidia$
```

(2) Unzip and install the brush package

Unzip the package, note that the filesystem needs to be extracted to the

Linux_for_Tegra a/rootfs directory via sudo.

```
$ tar -jxvf Jetson_Linux_R35.1.0_aarch64.tbz2
$ sudo tar -jxvf Tegra_Linux_Sample-Root-Filesystem_R35.1.0_aarch64.tbz2 -C Linux_for_Tegra
a/rootfs/
```

Execute the apply_binaries.sh script

```
$ cd Linux_for_Tegra/
$ sudo ./apply_binaries.sh

Setting up nvidia-l4t-initrd (35.1.0-20220810203728) ...
Pre-installing initrd package, skip flashing
Setting up nvidia-l4t-jetson-io (35.1.0-20220810203728) ...
Setting up nvidia-l4t-multimedia (35.1.0-20220810203728) ...
Setting up nvidia-l4t-pva (35.1.0-20220810203728) ...
Setting up nvidia-l4t-vulkan-sc-samples (35.1.0-20220810203728) ...
Setting up nvidia-l4t-weston (35.1.0-20220810203728) ...
Setting up nvidia-l4t-display-kernel (5.10.104-tegra-35.1.0-20220810203728) ...
Setting up nvidia-l4t-camera (35.1.0-20220810203728) ...
Setting up nvidia-l4t-graphics-demos (35.1.0-20220810203728) ...
Setting up nvidia-l4t-gstreamer (35.1.0-20220810203728) ...
Processing triggers for nvidia-l4t-kernel (5.10.104-tegra-35.1.0-20220810203728)
...
Processing triggers for libc-bin (2.31-0ubuntu9.9) ...
/home/sensing/nvidia/Linux_for_Tegra
Removing QEMU binary from rootfs
Removing stashed Debian packages from rootfs
L4T BSP package installation completed!
Disabling NetworkManager-wait-online.service
Disable the ondemand service by changing the runlevels to 'K'
Success!
```

Note: If an error is reported during the execution of this script, follow the prompts to install the appropriate dependency package.

(3) Refresh

Refer to section "2.1.1 Setting up Recovery Download Mode" to put the Jetson device into Recovery download mode. After confirming that the device is recognized with the lsusb command, execute the following command to refresh the device.

```
$ sudo ./flash.sh jetson-agx-orin-devkit mmcblk0p1
```

```
[ 688.5490 ] Bootloader version 01.00.0000
[ 688.5808 ] Writing partition A_MEM_BCT with mem_coldboot_sigheader.bct.encrypt
[ 243712 bytes ]
[ 688.5826 ] [.....] 100%
[ 691.6344 ] tegradevflash_v2 --write B_MEM_BCT mem_coldboot_sigheader.bct.encrypt
[ 691.6494 ] Bootloader version 01.00.0000
[ 691.6854 ] Writing partition B_MEM_BCT with mem_coldboot_sigheader.bct.encrypt
[ 243712 bytes ]
[ 691.6886 ] [.....] 100%
[ 694.7130 ] Flashing completed

[ 694.7228 ] Coldbooting the device
[ 694.7371 ] tegrarcm_v2 --chip 0x23 0 --ismb2
[ 694.7568 ] MB2 version 01.00.0000
[ 694.7947 ] Coldbooting the device
[ 694.7960 ] tegrarcm_v2 --chip 0x23 0 --reboot coldboot
[ 694.8031 ] MB2 version 01.00.0000
*** The target t186ref has been flashed successfully. ***
Reset the board to boot from internal eMMC.
```

After brushing, the Jetson device automatically reboots into Linux and follows the wizard to complete the configuration to access the desktop.



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WECHAT



SKYPE



After-sales service platform