



Jetson TX1 Developer Kit User Guide

March 2017

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Introduction

The NVIDIA® TX1 Developer Kit is a full-featured development platform for visual computing. It is ideal for applications requiring high computational performance in a low power envelope. The TX1 Developer kit is designed to get you up and running quickly: It comes pre-flashed with a Linux environment, includes support for many common APIs, and is supported by NVIDIA's complete development tool chain. The board exposes many standard hardware interfaces, enabling a highly flexible and extensible platform.

Go to <http://developer.nvidia.com/embedded-computing> for access to software updates and the developer SDK supporting the OS image and host development platform that you want to use. The SDK includes an OS image that you will load onto your device, developer tools, supporting documentation, and code samples to help you get started.

Getting Started

Individual development efforts will vary and may result in modifications to the system configuration. It is recommended that you begin with the basic system configuration (as shipped) to ensure proper system operation prior to any further development.

Assumptions

- > You have a Tegra Developer System, equipped with the NVIDIA® Tegra® TX1 processor.
- > Your developer system should be cabled as follows:
 - Serial cable plugged into the serial port on the target connected to your Linux host directly or through a serial-to-USB converter. (To setup serial console on the Linux host.)
 - (Not included in the developer kit) To connect USB peripherals such as keyboard, mouse, and [optional] USB/Ethernet adapter (for network connection), a USB hub should be connected to the working USB port on the system.
 - An HDMI cable plugged into the target which is connected to an external HDMI display.
 - An Ethernet cable plugged into the on board Ethernet port.

Powering Up the Tegra Device

1. Connect a USB keyboard to the USB Type A connector of your device.
2. Connect an HDMI-compatible display to the HDMI connector on your device.
3. Connect the AC adapter supplied in your kit to the power connector of your device. Use the supplied AC adapter since it is appropriately rated for your kit.
4. Plug the power adapter into an appropriately rated electrical outlet.
5. The system should power on. If not, press and release the power button on the device.

Login Credentials

- > Username: nvidia
- > Password: nvidia

Force Recovery Mode

To update your system, you will need to be in Force USB Recovery Mode so you can transfer system software to the developer board. When in Force USB Recovery Mode, you are able to update system software and write the boot loader, boot configuration table (BCT), and partition configuration to the Tegra device.

See the Developer SDK documentation for OS specific instructions when updating system software on your developer board.

To place system in Force USB Recovery Mode:

1. Power down the device. If connected, remove the AC adapter from the device. The device **MUST** be powered OFF, not in a suspend or sleep state.
2. Connect the Micro-B plug on the USB cable to the Recovery (USB Micro-B) Port on the device [4] and the other end to an available USB port on the host PC.
3. Connect the power adapter to the device.
4. With the system powered on, press and release the POWER button, if necessary; press and hold the RECOVERY FORCE button; while depressing the RECOVERY FORCE button, press and release the RESET button; wait two seconds and release the RECOVERY FORCE button.

Flashing the Boot Loader and Kernel

This section describes the steps required to flash and boot the target Tegra device. It also provides usage information for the `flash.sh` helper script.

Flash Procedure

First, flash the board with the boot loader and kernel, and, optionally, flash the rootfs to internal eMMC.

Prerequisites

The following directories must be present:

- `/bootloader`—boot loader plus flashing tools (NvFlash, CFG, BCTs, etc.)
- `/kernel`—a kernel `zImage` `/vmlinuz.uimg`, DTB files, and kernel modules
- `/rootfs`—the root file system that you download (This directory starts empty and you populate it with the sample file system.)
- `/nv_tegra`—NVIDIA® Tegra® user space binaries and sample applications

You must also have the USB cable connected to the recovery port prior to running the commands listed in the procedure. For more information, see the [Requirements](#) topic in this section.

To flash the boot loader and kernel

1. Put the target board into reset/recovery mode. Do so by first powering on the board and then holding the recovery button, and then pressing the reset button as described in the *Quick Start Guide* for the board.
2. Run the `flash.sh` script that is in the top level directory of this release. The script must be supplied with the target board (`jetson-TX1`) for the root file system:

```
$ sudo ./flash.sh <platform> <rootdev>
```

- If the root file system will be on a USB disk, execute the script as follows:

```
$ sudo ./flash.sh <platform> sda1
```

Note: If a SATA device is connected, that device enumerates as `sda1`.

- If the root file system will be on an SD card, execute the script as follows:

```
$ sudo ./flash.sh <platform> mmcblk1p1
```

- If the root file system will be on the internal eMMC, execute the script as follows:

```
$ sudo ./flash.sh <platform> mmcblk0p1
```

Where `<platform>` is `jetson-TX1`.

The above examples are for u-boot. For fastboot, add the following argument:

```
-L <PATH_TO_FASTBOOT_BIN_FILE>
```

The boot loader and kernel will load.

For more information on U-Boot, see the [U-Boot Guide](#) chapter of this document.

Flash Script Usage

You can find the most up-to-date usage information by running `flash.sh -h` (using the `flash.sh` script included in the release). The basic usage information is as follows.

Usage

```
sudo ./flash.sh [options] <platform> <rootdev>
```

Where you specify the required parameters and one or more of the options shown in the following table.

Parameters	Description
<platform>	Is jetson-TX1.
<rootdev>	Is one of following:
	mmcblk0p1 Specifies internal eMMC.
	mmcblk1p1 Specifies external SDCARD.
	sda1 Specifies external USB device (such as, USB memory stick or HDD).
	eth0 Specifies nfsroot via external USB Ethernet interface.
Options	Description
-h	Specifies to print this usage information.
-b <bctfile>	Specifies the NvFlash Boot Configuration Table (BCT) file.
-c <cfgfile>	Specifies the NvFlash configuration file.
-d <dtbfile>	Optionally specifies a device tree file to use instead of the default.
-e <emmc_file>	Specifies the eMMC size of the target device.
-f <flashapp>	Specifies the path to flash application: nvflash or tegra-rcm.
-i	Specifies to pass the user kernel command line to the kernel as-is.
-k <partition id>	Specifies the kernel partition ID to be updated (minimum = 5).
-n <nfs args>	Specifies the static NFS network assignments: <Client IP>:<Server IP>:<Gateway IP>:<Netmask>
-o <odmdata>	Specifies the ODM data value.
-p	Total eMMC HW boot partition size.
-r	Specifies to skip building and reuse existing system.img.
-s <ubootscript>	Specifies the boot script file for U-Boot.
-C <cmdline>	Specifies the kernel command line. Warning: Each option in this kernel command-line gets higher precedence over the same option

	from fastboot. In case of NFS booting, this script adds NFS booting related arguments if the -i option is omitted.
-F <flasher>	Specifies the flash server, such as fastboot.bin.
-I <initrd>	Specifies initrd file. Null initrd is the default.
-K <kernel>	Specifies the kernel image, such as zImage.
-L <bootloader>	Specifies the full path to the boot loader, such as fastboot.bin or u-boot.bin.
-P <end_of_PPT_plus_1>	Specifies the sum of the primary GPT start address, the size of PPT, plus 1.
-R <rootfs dir>	Specifies the sample rootfs directory.
-N <nfsroot>	Specifies the nfsroot, for example: <my IP addr>:/my/exported/nfs/rootfs
-S <size>	Specifies the rootfs size in bytes. This is valid only for internal rootdev. KiB, MiB, GiB style shorthand is allowed. For example, 1GiB signifies 1024 * 1024 * 1024 bytes.
-T <ITS file>	ITS file name. Valid only for u-boot.

JetPack

This section is intended to help you get familiar with installing the Developer Pack (JetPack TX1), using the tools and running sample code.

Before you Begin

- > You have a Tegra Developer Kit equipped with the NVIDIA Tegra TX1 processor.
- > You have a host machine that is running Linux.
- > Your developer system is cabled as follows:
 - Serial cable plugged into the serial port J1A2 UART4 on the target connected to your Linux host directly or through a serial-to-USB converter. (To setup serial console on the Linux host.)
 - USB Micro-B cable connecting (J1E1 USB0) to your Linux host for flashing.
 - (Not included in the developer kit) To connect USB peripherals such as keyboard, mouse, and [optional] USB/Ethernet adapter (for network connection), a USB hub should be connected to the working USB port (J1C2 USB2) on the system.
 - An HDMI cable plugged into "J1C1 HDMI1" on the target which is connected to an external HDMI display.
 - An Ethernet cable plugged into the J1D1 on board Ethernet port.
- > Download latest JetPack TX1
 - The latest version of the Development Pack (JetPack TX1) is available at [NVIDIA Developer](#).
 - All available JetPack TX1 downloads [here](#).

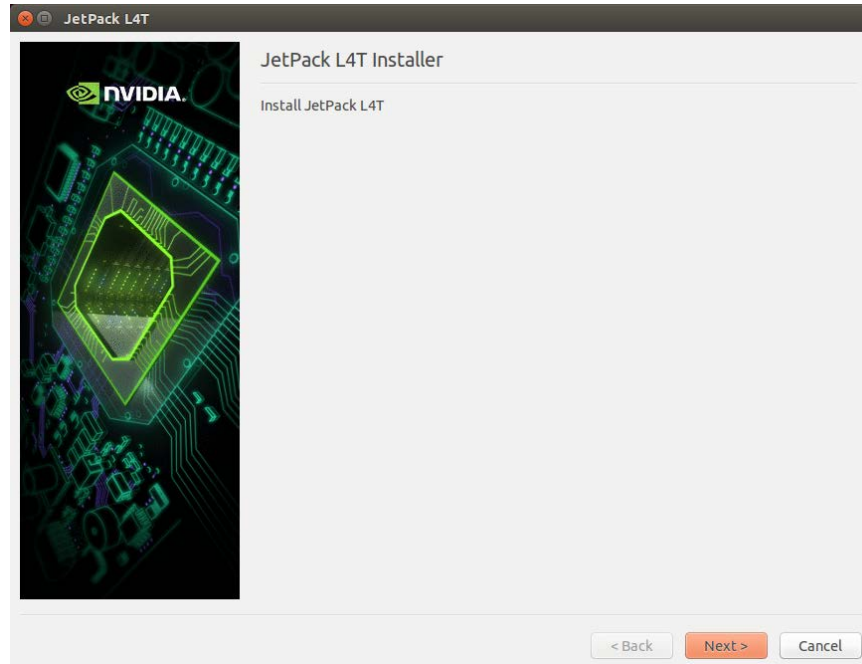
Installing JetPack TX1

The following instructions assume you have downloaded the latest JetPack version, JetPack-`${VERSION}`.run, where `${VERSION}` refers to the version string for the installer you have.

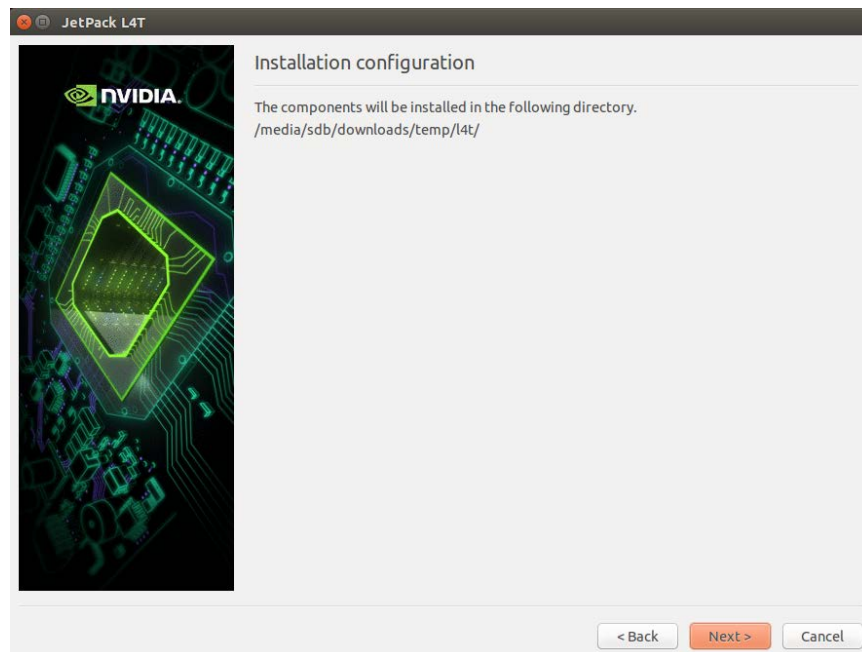
1. Add exec permissions for the JetPack-`${VERSION}`.run

```
chmod +x JetPack-${VERSION}.run
```

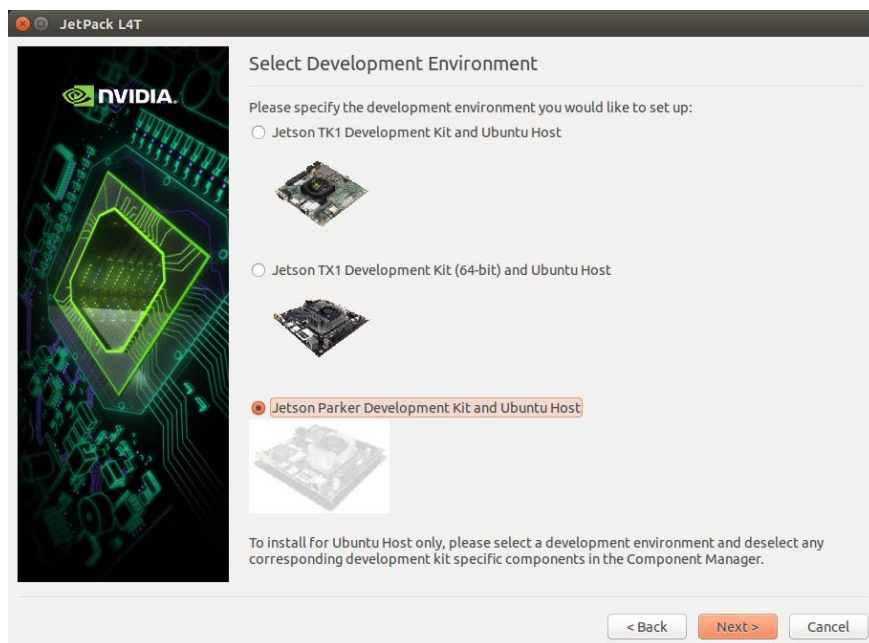
2. Run `JetPack-${VERSION}.run` in terminal on your host Ubuntu machine.



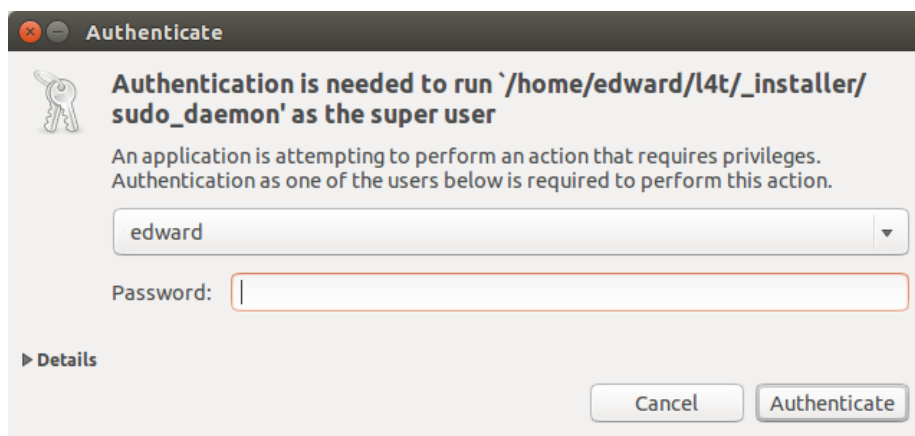
3. Next, the JetPack installer will indicate the installation directory.



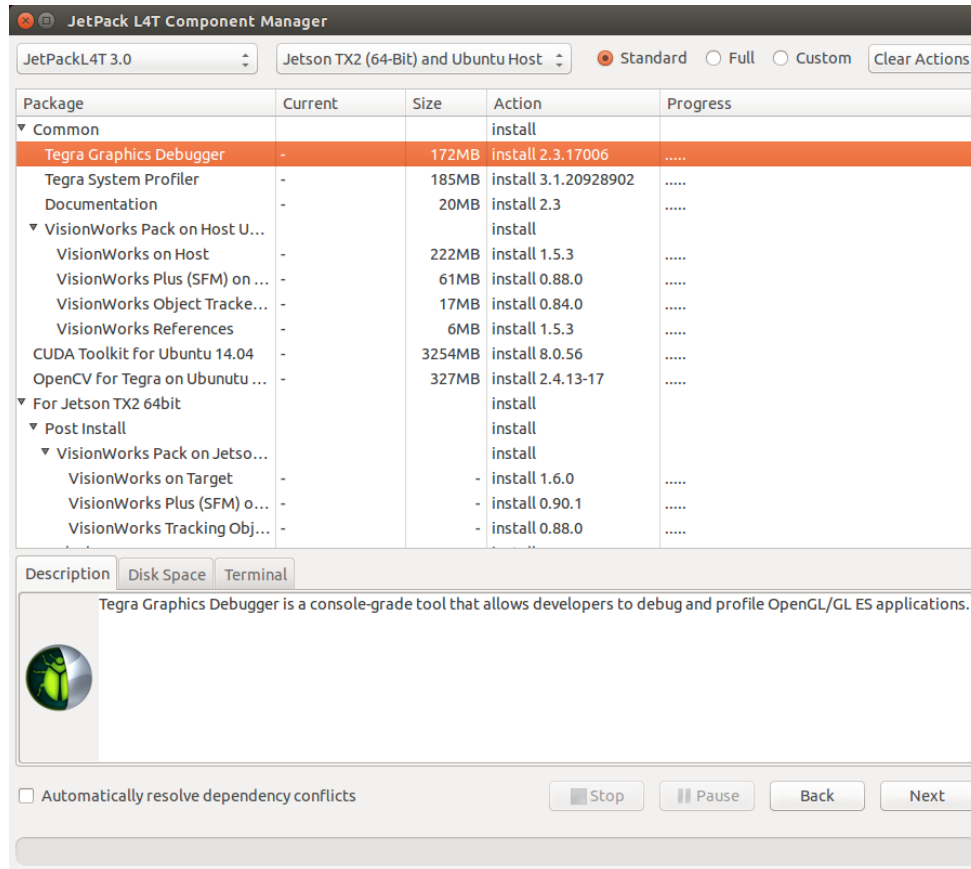
4. Select the development environment to setup.



5. The JetPack installer will pop up a window to ask for permission to use during the installation process; you will need to enter your sudo password here.

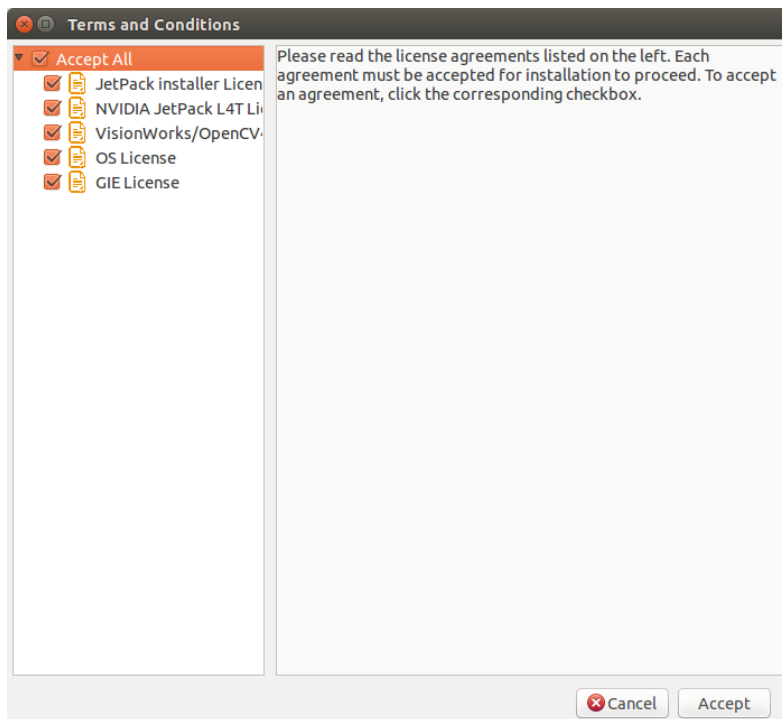


- The Component Manager opens, which allows you to customize which components to install. Select the Jetson Developer Kit you would like to develop for to customize the installation components for each device. Jetson TK1 Developer Kit, Jetson TX1 Developer Kit, and Jetson TX1 Developer Kit support are available.

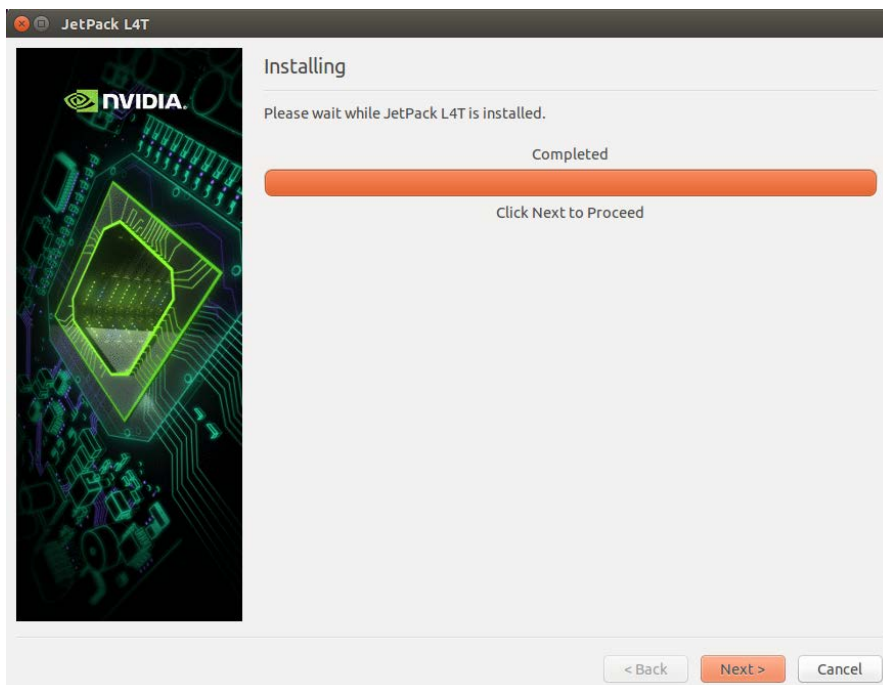


NOTE: To run a standalone Ubuntu install, deselect Jetson target specific entries.

7. Accept the license agreement for the selected components.

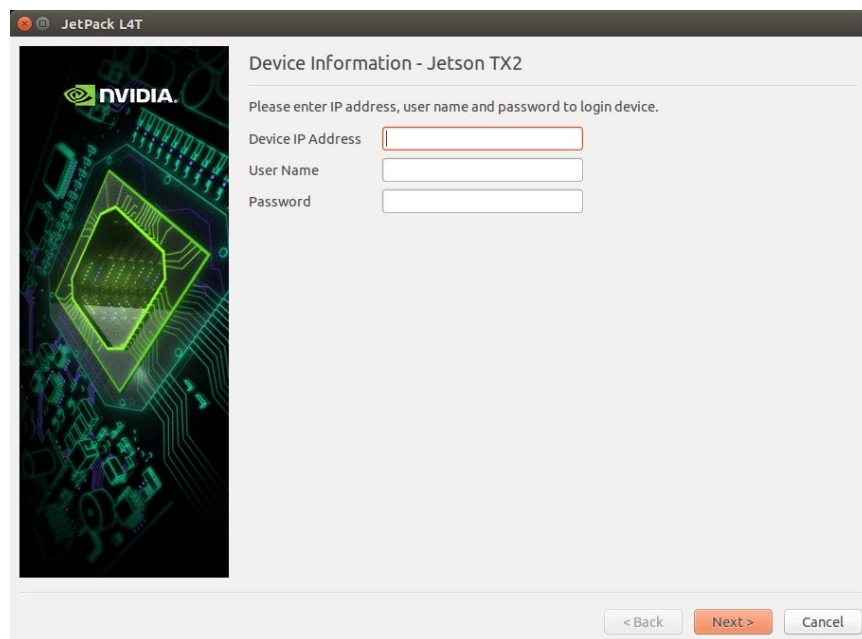


8. The Component Manager will proceed with the installation. Once the host installation steps are completed, click the Next button to continue with the installation of target components.



NOTE: JetPack will now proceed with setting up the Jetson Developer Kit target, if the corresponding components were selected (i.e., flashing the OS and pushing components to the Jetson Developer Kit target).

9. If you deselected **Flash OS** in the Component Manager, you will need to enter the IP address, user name, and password to set up an ssh connection to the target device.

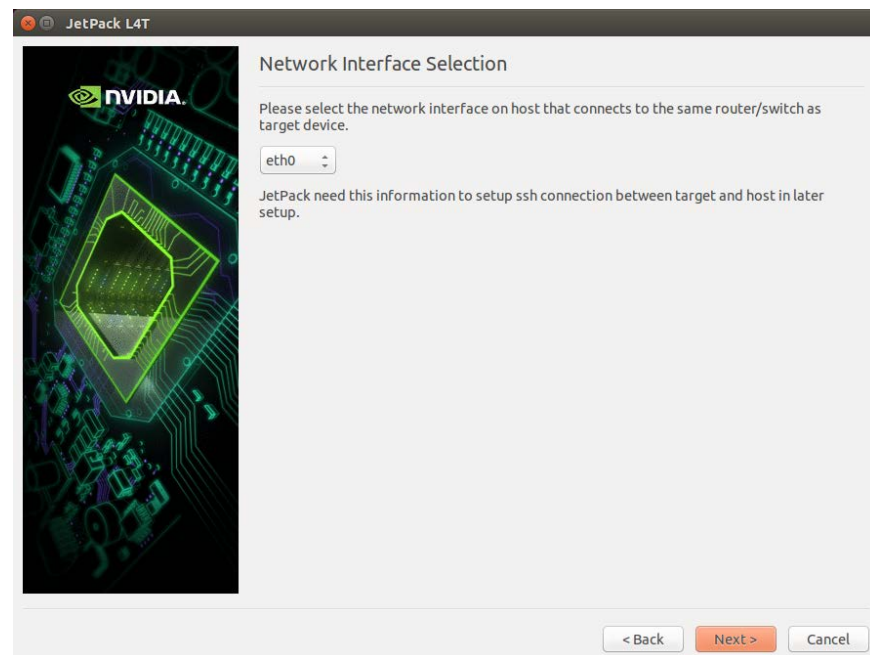


After you enter the required information and click **Next**, JetPack will begin installing components on the target device.

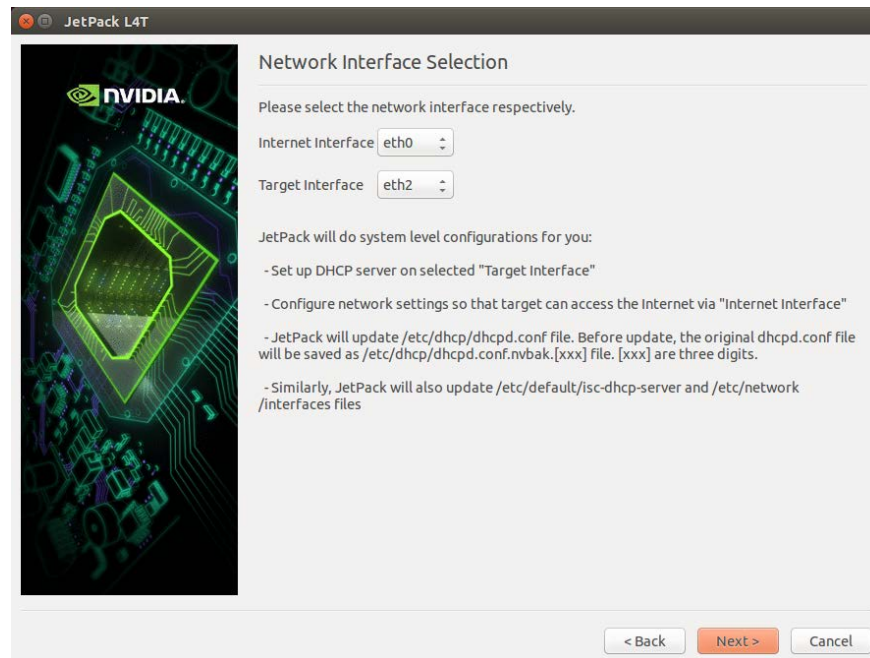
- If you selected **Flash OS** in the Component Manager, you will need to select the network layout for your specific environment.



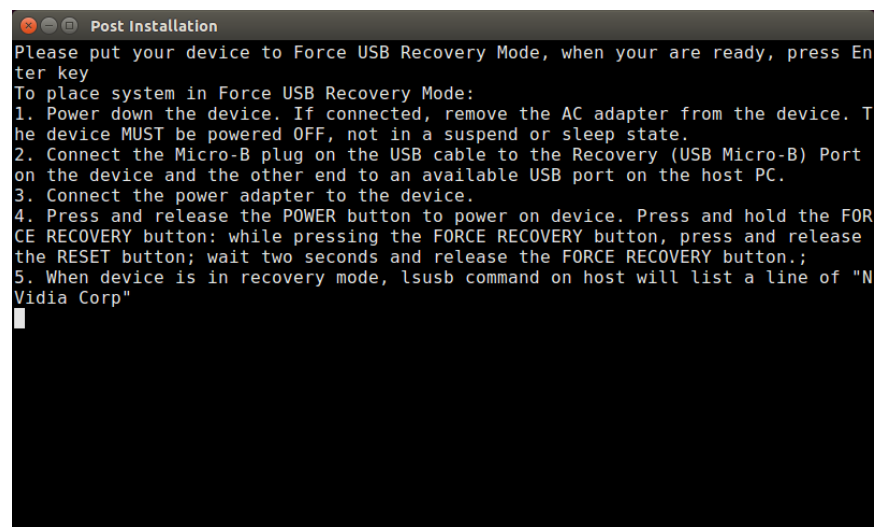
- If you selected the **Device access Internet via router/switch** layout, you will be asked to select which interface to use for Internet access.



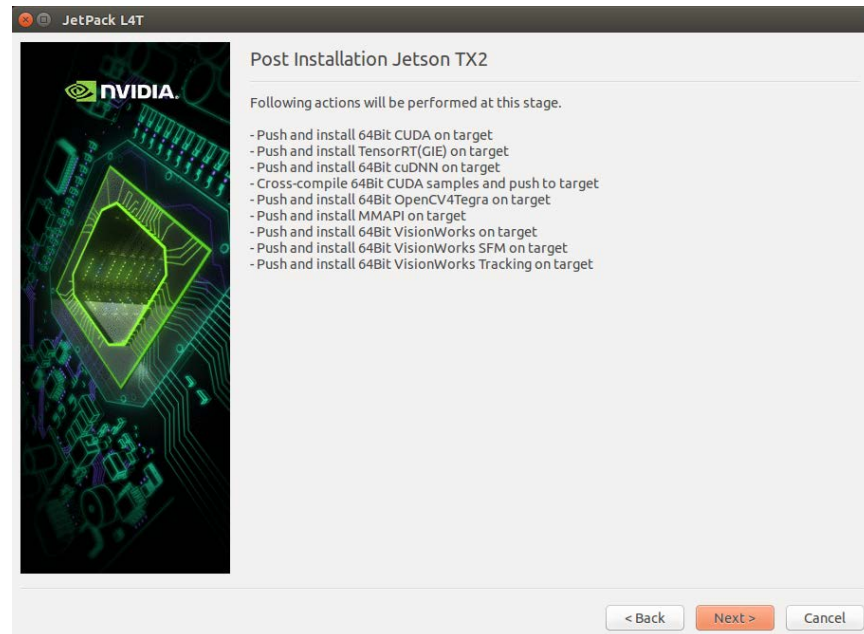
12. If you selected the **Device get IP assigned by DHCP server on host and access Internet via host machine** layout, you must select which interface is to be used for Internet access, and which is to be used for the target interface.



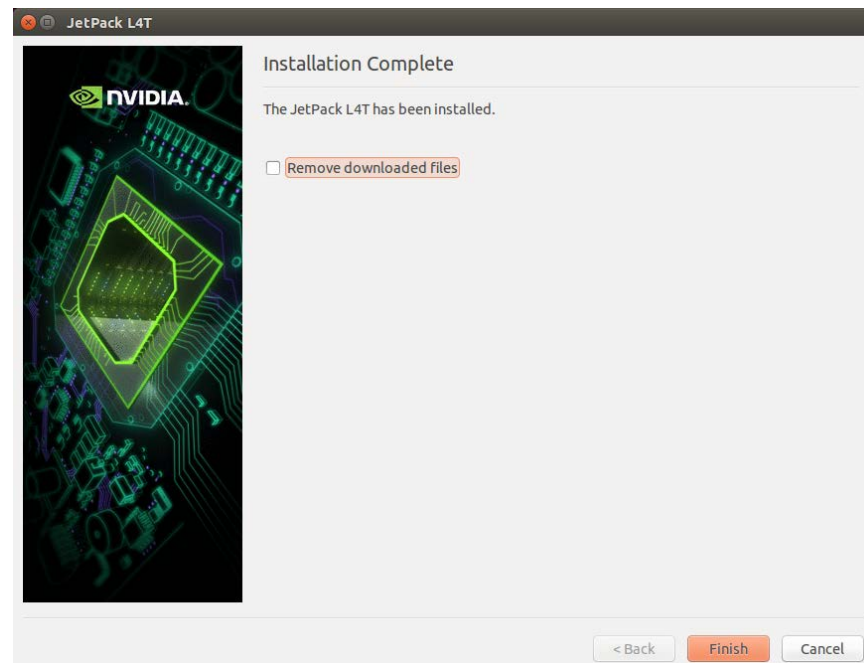
13. A pop-up window will instruct you to put your device into Force USB Recovery Mode, so you can flash the OS.



14. Next, you will be prompted to install components on the specific target machine, and to compile samples.



15. After the post installation tasks have been completed, the installation will be complete.



Compiling

JetPack TX1 automatically compiles all samples if “Compile Samples” was checked during components selection. If you selected CUDA components, CUDA samples will be found in the following directory:

`<JetPack_Install_Dir>/NVIDIA_CUDA-<version>_Samples` directory.

You could recompile the samples by running:

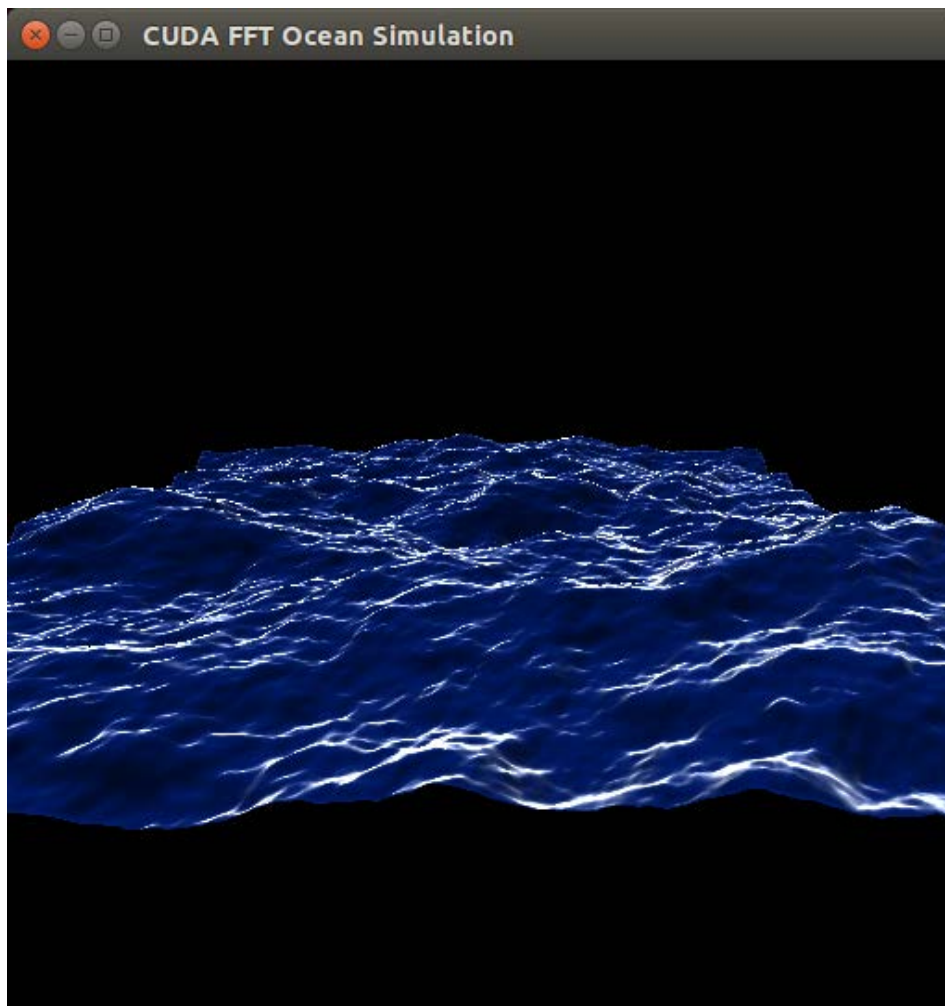
```
SMS=53 EXTRA_LDFLAGS=-unresolved-symbols=ignore-in-shared-libs  
TARGET_ARCH=aarch64 make
```

Run JetPack TX1 Samples

The CUDA samples directory will be copied to the home directory on your device by JetPack. The built binaries can be found in the following directory:

```
/home/ubuntu/NVIDIA_CUDA-<version>_Samples/bin/aarch64/linux/release/
```

Run them by calling them in terminal, or double-clicking on them in the file browser. For example, when you run the oceanFFT sample, the following screen will be displayed.



Compliance

The NVIDIA® Jetson TX1 Developer Kit is compliant with the regulations listed in this section. Compliance marks, including the FCC and IC ID numbers, can be found at

<http://developer.nvidia.com/embedded-computing>

United States

Federal Communications Commission (FCC)



FCC ID: LDKNVTX11697

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 any interference that may cause undesired operation of the device.

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.

FCC Warning: The FCC requires that you be notified that any changes or modifications to this device not expressly approved by the manufacturer could void the user's authority to operate the equipment.

RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Only those antennas with same type and lesser/equal gain filed under this FCC ID number can be used with this device.

This radio transmitter [FCC ID: LDKNVTX11697] has been approved by FCC to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Ant.	Brand	Model Name	Antenna Type	Connector
1	Shanghai Amphenol Airwave	Ci8717-15-000-R	PCB Antenna	Reversed-SMA
2	Shanghai Amphenol Airwave	Ci8717-15-000-R	PCB Antenna	Reversed-SMA
3	Shanghai Amphenol Airwave	Ci8210-15-000-R-TA	PCB Antenna	I-PEX
4	Shanghai Amphenol Airwave	Ci8211-15-000-R	PCB Antenna	I-PEX
5	Shanghai Amphenol Airwave	CI9808-15-000-R	PCB Antenna	I-PEX
6	Shanghai Amphenol Airwave	CI9809-15-000-R	PCB Antenna	I-PEX
7	Shanghai Amphenol Airwave	CI9811-15-000-R	PCB Antenna	I-PEX
8	Shanghai Amphenol Airwave	CI9810-15-000-R	PCB Antenna	I-PEX
9	Shanghai Amphenol Airwave	CI9812-15-000-R	PCB Antenna	I-PEX
10	Shanghai Amphenol Airwave	CI9813-15-000-R	PCB Antenna	I-PEX

Ant.	Gain (dBi)					
	2.4G	BT	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
1	6.02	6.02	5.53	6.48	7.91	5.38
2	6.02	6.02	5.53	6.48	7.91	5.38
3	-2.3	-2.3	2.5	2.9	3	3.2
4	-2.1	-2.1	1.2	1.7	3.2	4.1
5	-	-	-7.8	-7.8	-6.5	-5
6	-	-	-5.9	-5.7	-4.5	-3.1
7	-	-	-6.5	-6.1	-4.1	-3.7
8	-	-	-6.1	-5.7	-4.6	-3.3
9	-	-	-6.1	-7.6	-4.8	-4
10	-	-	-6.1	-7.6	-4.8	-4

The module is limited to OEM installation ONLY.

This module is intended for OEM integrators under the following conditions:

1. This module is restricted to installation in products for use only in mobile and fixed applications.
2. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.
3. The antenna(s) used for this transmitter must not transmit simultaneously with any other antenna or transmitter.
4. OEM integrator has be limited the operation channels in channel 1-11 for 2.4GHz band.
5. Fixed outdoor applications for point to multipoint operations are subject to the conditions in Part 15.407(a)(1)(i).

The OEM integrator is still responsible for

1. ensuring that the end-user has no manual instructions to remove or install module
2. the FCC compliance requirement of the end product, which integrates this module.
3. Appropriate measurements (e.g. 15 B compliance) and if applicable additional equipment authorizations (e.g. Verification, Doc) of the host device to be addressed by the integrator/manufacture.
4. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations

Guidance to the Host Manufacturer:

We hereby acknowledge our responsibility to provide guidance to the host manufacturer in the event that they require assistance for ensuring compliance with the Part 15 Subpart B requirements.

The user manual of the end product should include

1. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
2. the restriction of operating this device in indoor could void the user's authority to operate the equipment.
3. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.
4. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.
5. The FCC part 15.19 statement: 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.

Label of the end product:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: LDKNVTX11697 "

The end product shall bear the following 15.19 statement: 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.

If the labelling area is considered too small and therefore it is impractical (smaller than the palm of the hand) to display the compliance statement, then the statement may be placed in the user manual or product packaging.

Underwriters Laboratories (UL)

UL Listed Product Logo for Jetson TX1 Developer Kit, model name P2597.



I.T.E E204896

UL Recognized Component Logo for Embedded System Module, model name P2180.



Canada

Industry Canada (IC)

IC: 2461N-NVTX11697

CAN ICES-3(B)/NMB-3(B)

This device complies with *Industry Canada's licence-exempt RSSs* of the Industry Canada Rules. . Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

Ce dispositif est conforme à la norme RSS-247 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

This radio transmitter [IC: 2461N-NVTX11697] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Le présent émetteur radio [IC: 2461N-NVTX11697] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

Ant.	Brand	Model Name	Antenna Type	Connector
1	Shanghai Amphenol Airwave	Ci8717-15-000-R	PCB Antenna	Reversed-SMA
2	Shanghai Amphenol Airwave	Ci8717-15-000-R	PCB Antenna	Reversed-SMA
3	Shanghai Amphenol Airwave	Ci8210-15-000-R-TA	PCB Antenna	I-PEX
4	Shanghai Amphenol Airwave	Ci8211-15-000-R	PCB Antenna	I-PEX
5	Shanghai Amphenol Airwave	CI9808-15-000-R	PCB Antenna	I-PEX
6	Shanghai Amphenol Airwave	CI9809-15-000-R	PCB Antenna	I-PEX
7	Shanghai Amphenol Airwave	CI9811-15-000-R	PCB Antenna	I-PEX
8	Shanghai Amphenol Airwave	CI9810-15-000-R	PCB Antenna	I-PEX
9	Shanghai Amphenol Airwave	CI9812-15-000-R	PCB Antenna	I-PEX
10	Shanghai Amphenol Airwave	CI9813-15-000-R	PCB Antenna	I-PEX

Ant.	Gain (dBi)					
	2.4G	BT	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
1	6.02	6.02	5.53	6.48	7.91	5.38
2	6.02	6.02	5.53	6.48	7.91	5.38
3	-2.3	-2.3	2.5	2.9	3	3.2
4	-2.1	-2.1	1.2	1.7	3.2	4.1
5	-	-	-7.8	-7.8	-6.5	-5
6	-	-	-5.9	-5.7	-4.5	-3.1
7	-	-	-6.5	-6.1	-4.1	-3.7
8	-	-	-6.1	-5.7	-4.6	-3.3
9	-	-	-6.1	-7.6	-4.8	-4
10	-	-	-6.1	-7.6	-4.8	-4

RF Radiation Exposure Statement:

Jetson Dev Kit has been tested and complies with IC RSS 102 RF radiation exposure limits set forth for an uncontrolled environment when used with the NVIDIA accessories supplied or designated for this product. To satisfy IC exposure requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and persons during device operation.. The use of any other accessories may not ensure compliance with IC RSS 102RF exposure guidelines.

Déclaration d'exposition aux radiations:

La Jetson Dev Kit a été testée conformément aux normes d'exposition d'émission RF de la IC RSS 102 pour un environnement non contrôlé lors d'utilisation avec les accessoires fournis ou recommandés par NVIDIA. Pour satisfaire aux exigences d'exposition IC, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et des personnes pendant le fonctionnement de l'appareil. L'utilisation d'accessoires autres que ceux recommandés par NVIDIA ne garantit pas la compatibilité avec les normes d'émission RF de la IC RSS 102.

OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the IC authorization is no longer considered valid and the IC No. cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate IC authorization.

Modular OEM Integrator Notice

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains transmitter module IC: 2461N-NVTX11697".

Contient le module d'émission IC: 2461N-NVTX11697

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

- 1) L'antenne doit être installée de telle sorte qu'une distance de 20cm est respectée entre l'antenne et les utilisateurs, et
- 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Modular OEM Integrator Notice

IMPORTANT NOTE for OEM integrator:

This module is intended for OEM integrator.

The OEM integrator is still responsible for

1. ensuring that the end-user has no manual instructions to remove or install module
2. the ISED compliance requirement of the end product, which integrates this module.
3. Appropriate measurements and if applicable additional equipment authorizations of the host device to be addressed by the integrator/manufacturer.
4. The separate approval is required for all other operating configurations, including portable configurations and different antenna configurations

Taiwan

National Communications Commission

國家通訊傳播委員會



CCXXxxLPyyyZz

注意！

依據 低功率電波輻射性電機管理辦法

第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

模組認證合格標籤（ID）：

“ CCXXxxLPyyyZz

如果使用本模組之平台，無法在外部看見審驗合格標籤時，應在該

平台的外部明顯標示

“內含射頻模組  CCXXxxLPyyyZz.

應避免影響附近雷達系統之操作。

高增益指向性天線只得應用於固定式點對點系統。

電磁波曝露量 MPE 標準值 $1\text{mW}/\text{cm}^2$ ，送測產品實測值為： $0.1883\text{ mW}/\text{cm}^2$ 。

本公司於口明書中提供所有必要資訊以指導使用者/安裝者正確的安裝及操作。

無線資訊傳輸設備必須具備安全功能，以保護未經授權之一方任意更改軟體進而避免發射機操作於非經認證之頻率、輸出功率、調變形式或其他射頻參數設定。

Taiwan RoHS Material Content Declaration

限用物質含有情況標示聲明書 Declaration of the presence condition of the Restricted Substances Marking						
設備名稱: Jetson TX2 Developer Kit Equipment Name: Jetson TX2 Developer Kit						
單元 Parts	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr(VI))	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
印刷電路部件 PCA	-	□	□	□	□	□
處理器 Processor	□	□	□	□	□	□
存儲設備 System memory	-	□	□	□	□	□
電源設備 Power adapter	-	□	□	□	□	□
攝像頭 Camera module	-	□	□	□	□	□
天線 Antenna	-	□	□	□	□	□
機械部件 Mechanicals	-	□	□	□	□	□
線材/連接器 Cables/Connectors	-	□	□	□	□	□
焊接金屬 Soldering material	□	□	□	□	□	□
助焊劑, 錫膏, 標籤及耗材 Flux, Solder Paste, label and other consumable materials	□	□	□	□	□	□
備考1: □: 系指該項限用物質未超出百分比含量基準值 Note 1: □: indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence. 備考2: -: 系指該項限用物質為除外項目。 Note 2: -: indicates that the restricted substance corresponds to the exemption. 此表中所有名稱中含“-”的部件均符合歐盟 RoHS 立法。 All parts named in this table with an “-” are in compliance with the European Union’s RoHS Legislation. 注: 環保使用期限的參考標識取決與產品正常工作的溫度和濕度等條件 Note: The referenced Environmental Protection Use Period Marking was determined according to normal operating use conditions of the product such as temperature and humidity.						



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