5G Dongle

User manual

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1. Foreword

1.1 Introduction

This document describes the VOS 5G Dongle product detail specification and user manual. It helps you quickly retrieve product specifications, electrical, product functions and product usage details.

1.2 Safety Information

The following safety precautions must be observed during all phases of operation, such as usage, service or repair of any cellular terminal or mobile incorporating with 5G Dongle. Manufacturers of the cellular terminal should send the following safety information to users and operating personnel, and incorporate these guidelines into all manuals supplied with the product. If not so, VOS assumes no liability for customers' failure to comply with these precautions.

Full attention must be given to driving at all times in order to reduce the risk of an accident. Using a mobile while driving (even with a hands free kit) causes distraction and can lead to an accident. Please comply with laws and regulations restricting the use of wireless devices while driving.

Switch off the cellular terminal or mobile before boarding an aircraft. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. If the device offers an Airplane Mode, then it should be enabled prior to boarding an aircraft. Please consult the airline staff for more restrictions on the use of wireless devices on boarding the aircraft.

Wireless devices may cause interference on sensitive medical equipment, so please be aware of the restrictions on the use of wireless devices when in hospitals, clinics or other healthcare facilities.

Cellular terminals or mobiles operating over radio signals and cellular network cannot be guaranteed to connect in all possible conditions (for example, with unpaid bills or with an invalid (U) SIM card). When emergent help is needed in such conditions, please remember using emergency call. In order to make or receive a call, the cellular terminal or mobile must be switched on in a service area with adequate cellular signal strength.

The cellular terminal or mobile contains a transmitter and receiver. When it is ON, it receives and transmits radio frequency signals. RF interference can occur if it is used close to TV set, radio, computer or other electric equipment.

In locations with potentially explosive atmospheres, obey all posted signs to turn off wireless devices such as your phone or other cellular terminals. Areas with potentially explosive atmospheres include fueling areas, below decks on boats, fuel or chemical transfer or storage facilities, areas where the air contains chemicals or particles such as grain, dust or metal powders, etc.

1.3 Device information

5G Dongle embedded with TRITOM SG500M2-X 5G Module is a highly integrated 5G NR FR1 wireless communication module that adopts standard USB 3.1 Type-C interface as the dongle device and backward supports with LTE/WCDMA system. It is applicable to most broadband communication networks of the mobile operator across the world.

Specification		
Platform	QCT SDX55 Cortex-A7 up to 1.5 GHz	
Memory	4Gb NAND Flash (ONFI) with 4Gb LPDDR4X(1.8GHz) MCP	
Operating Band	TW	5G : n1, n3, n7, n8, n28, n38, n41, n78, n79 4G : B1, B3, B7, B8, B28, B38, B41 3G : B1, B8
	JP	5G : n77,n78, n79 4G : B1, B3, B8, B18, B19, B26, B28, B41, B42 3G : B1,B8, B9, B19
	EU	5G : n1, n3, n20, n28, n78 4G : B1, B3, B7, B8, B20, B28, B38, B46 3G : B1,B2,B4,B5,B8
	NA	5G : n2, n5, n66, n71 4G : B2, B4, B5, B7, B12, B13, B14, B25, B26, B29, B30, B41, B46, B48, B66, B71 3G : B2,B4,B5,B8
Network option	SA	Option 2
	NSA	Option 3x/3a
Downlink	LTE	LTE CAT 20
	5G sub-6	1CC; Max BW 100MHz; MIMO 4x4
Uplink	LTE	LTE CAT 13
	5G sub-6	1CC; Max BW 100MHz; MIMO 2x2
Carrier aggregation	ULCA, DLCA and EN-DC	

SRS antenna switching	n77/n78/n79 : 1T2R(NSA) + 2T4R(SA)
Power Supply	5V ±5%
Temperature	Operating temperature [1]:-10°C ~ +50°C
	Storage temperature: -40°C ~ +85°C
Physical characteristics	Interface: USB Type C, Nano-Sim
	Dimension: 87.5 x 38.9 x 21 mm
	Weight: 70g
Software	
Driver	Microsoft Windows 10, Mac, 10.15, Ubuntu14.04, Linux 3.13 and later
AT commands	3GPP TS 27.007 and 27.005

2. Device ID & IO Positions

2.1 Device LED Status

Dongle have 2 LEDs for below connection situations shows by tow.

Situations	Red	Green
Power On	Keep On	Off
Search Network	Slow Flash	Off
Connected	OFF, Network connected	Keep On
Data transmit	Off	Slow Flash
Data transmit > 200Mbps	Off	Fast Flash
Firmware update	Keep On	Flashing
Error	Keep On	Keep On

3. Connectivity

VOS 5G Dongle uses USB 3.1 Type C to Type C cable to link dongle & various host. Need to use the certified cable in box to retrieve the best performance.

Note: Please do not use any other type of cable with Type C adapter to link the dongle and various host.

Step 1: Insert Nano-SIM (Push In; Push Out)

Step 2: USB Cable

Step 3: Link to Host ex. PC, Notebook, IPC… etc.

Notice: Make sure the cable is well-plugged in device side before connected to host I/O.

Notice:

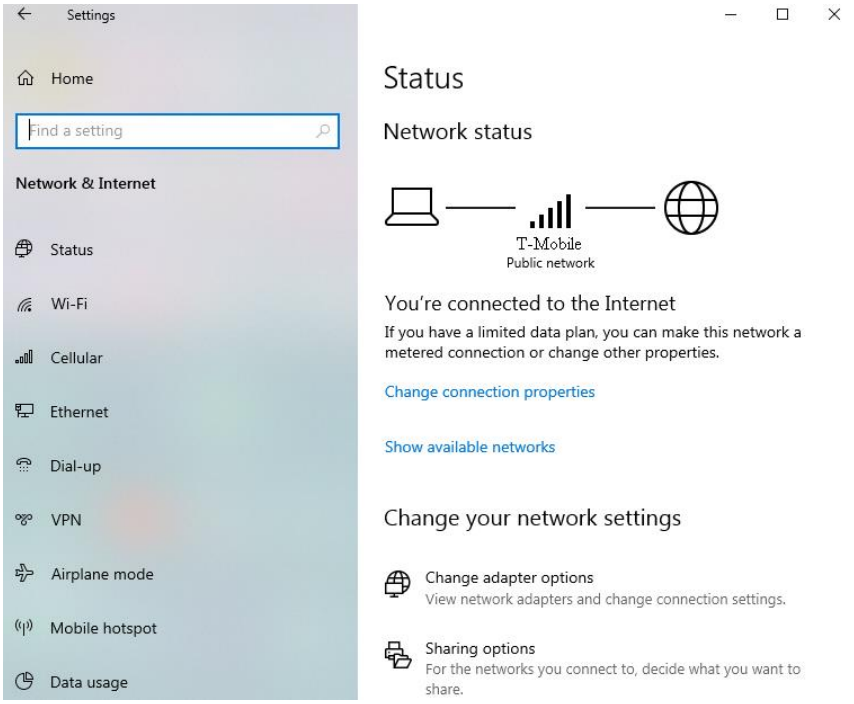
If the Nano SIM card is hard to push-in and push-out, users can use the SIM card adapter enclosed with the nano SIM card or credit card corner to push the nano SIM card in and out.

3.1 Host OS by Windows

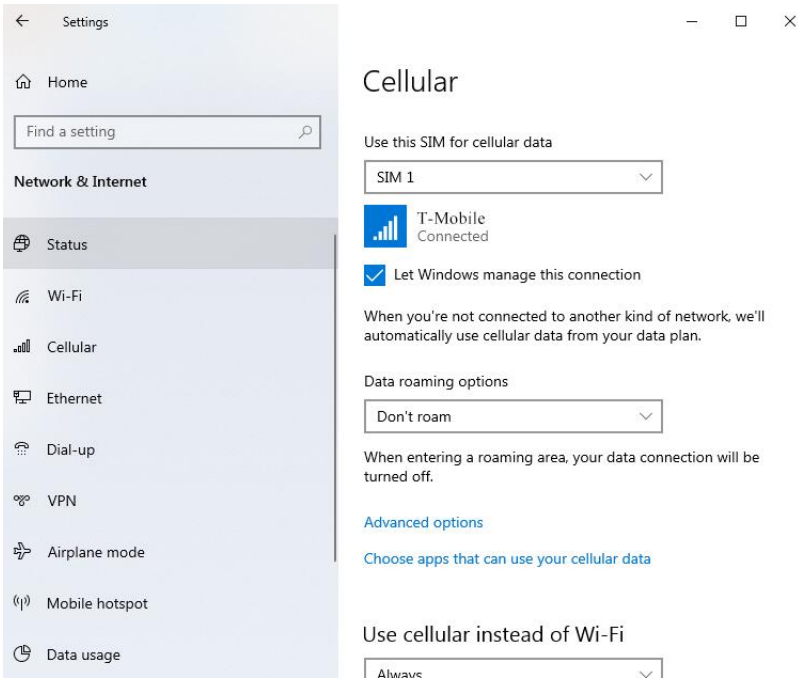
3.1.1 Windows UI & Setting

Dongle will boot and register to network automatically after connect to host. You can check the network status by click “internet access” icon.

In the Network & Internet Settings, you can see the overview of network status.

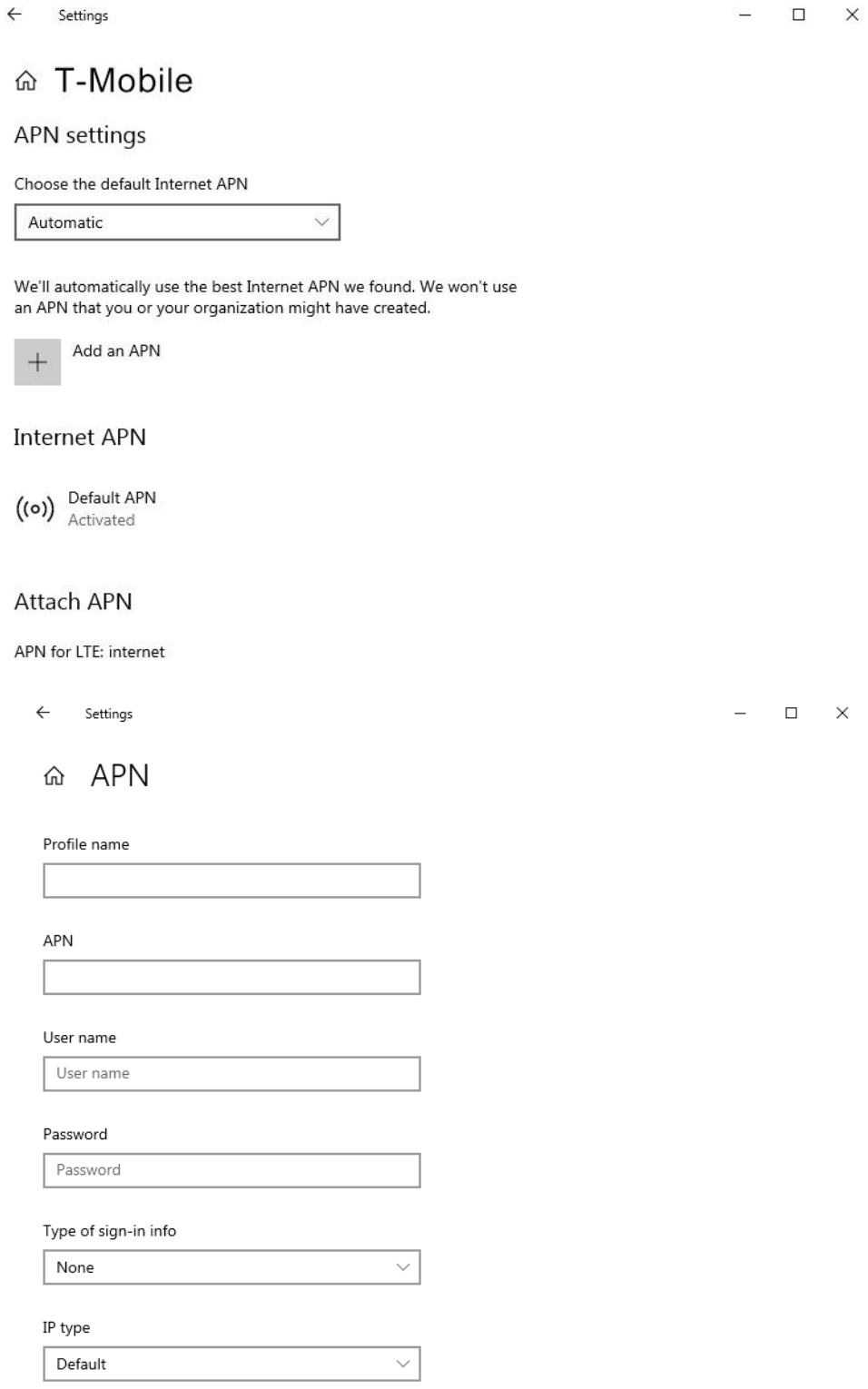


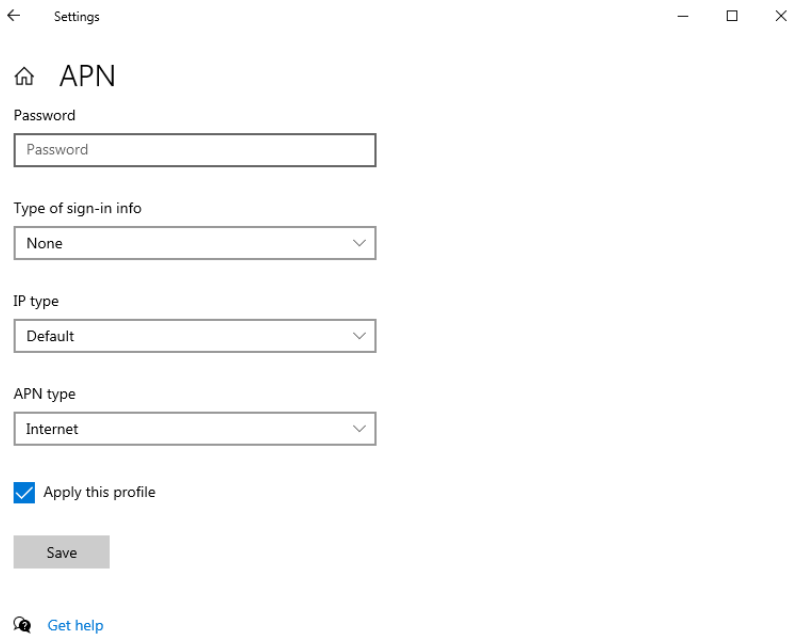
If you want to create a new APN setting, you can go to “Mobile” -> “Advanced options” to see APN settings.



If you want to add a new APN profile, click “Add an APN” and enter profile data.

Remember to “Save” when finished input.





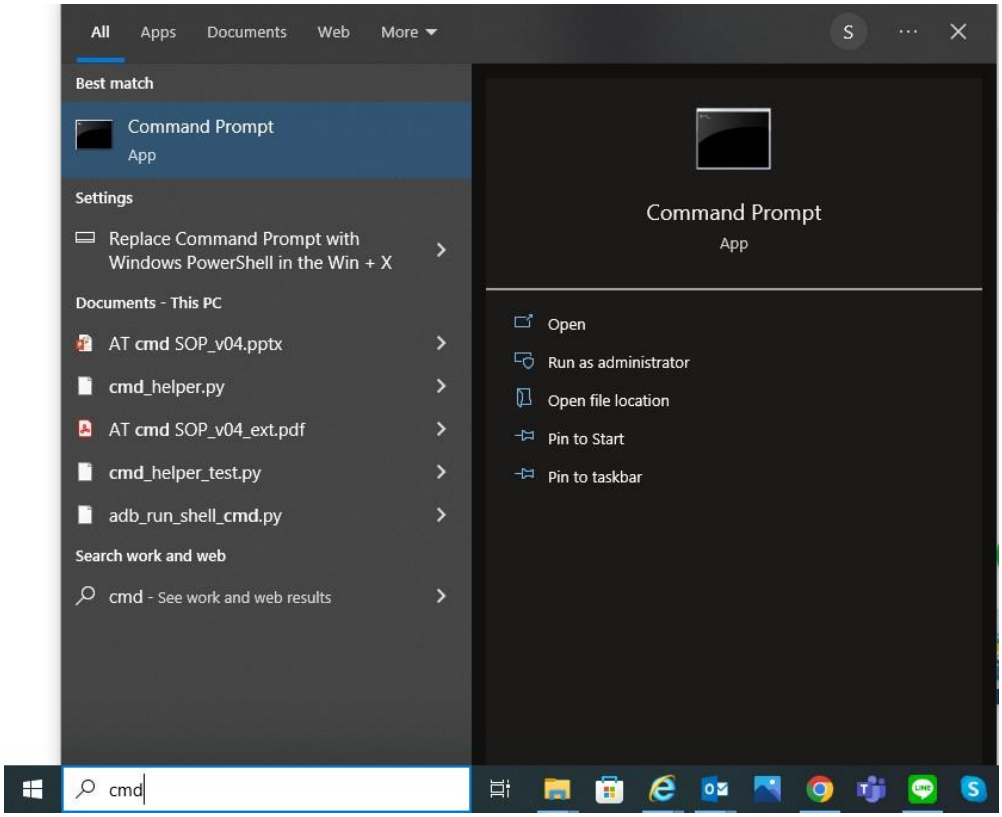
3.1.2 Firmware update

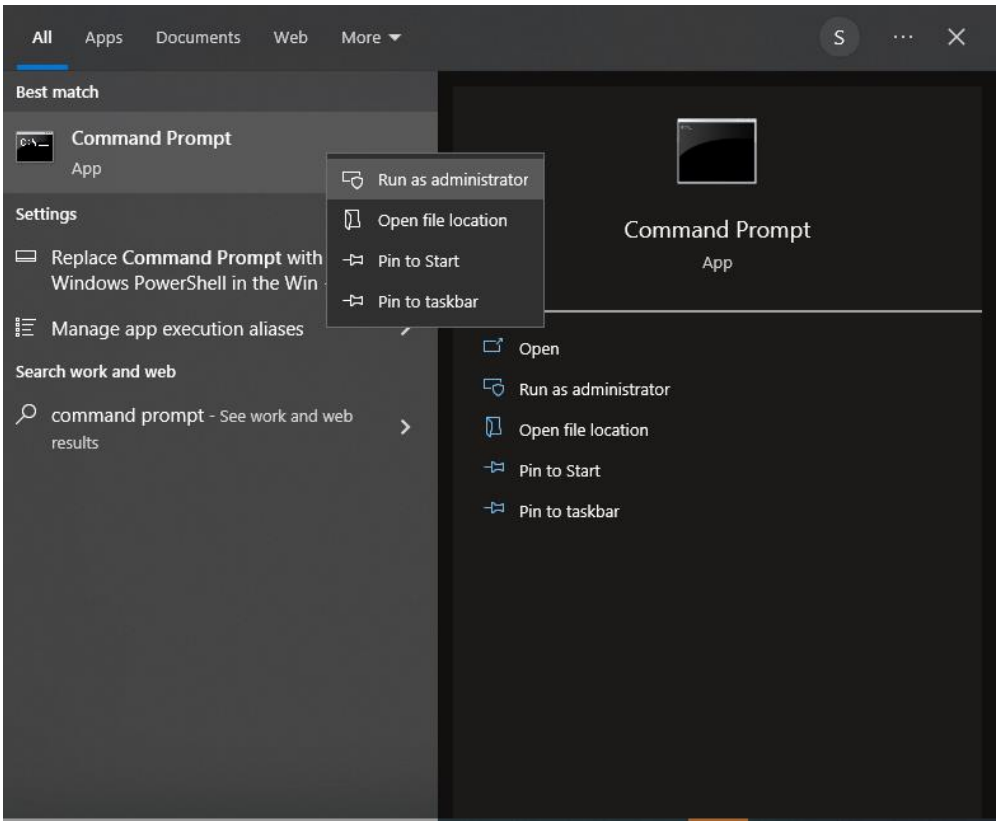
You can use “Windows Update” to find latest firmware for update.

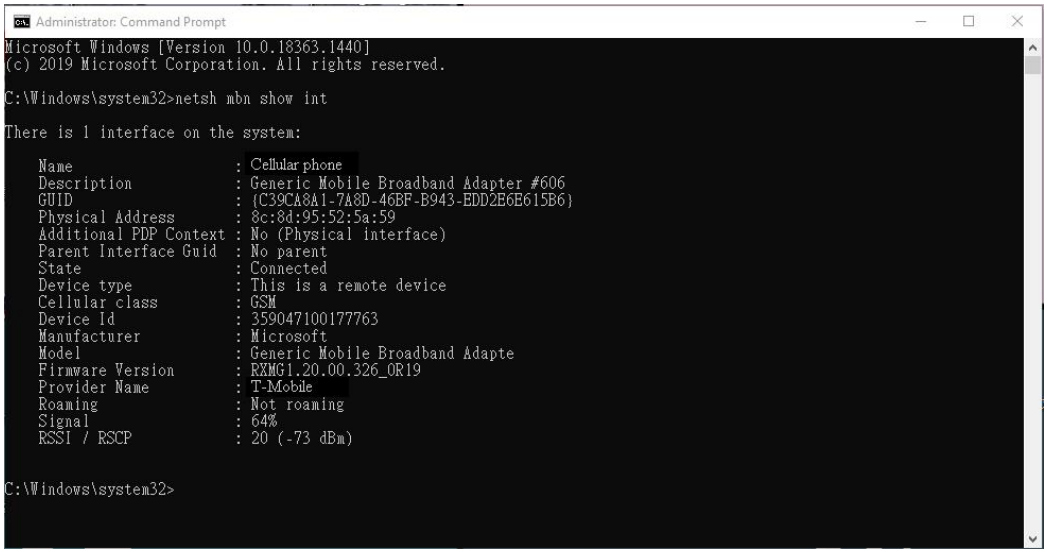
Or manually find fota package from https://www.tricascadeinc.com/vos-5g and follow SOP below (see page 15).

3.1.2.1 Find your dongle firmware

Open command prompt by typing cmd in the search window and open as administrator mode.


All
Apps
Documents
Web
More
Best match
Command Prompt
App
Settings
Replace Command Prompt with Windows PowerShell in the Win + X
Documents - This PC
AT cmd SOP_v04.pptx
cmd_helper.py
AT cmd SOP_v04_ext.pdf
cmd_helper_test.py
adb_run_shell_cmd.py
Search work and web
cmd - See work and web results
Command Prompt
App
Open
Run as administrator
Open file location
Pin to Start
Pin to taskbar
cmd


All
Apps
Documents
Web
More
Best match
Command Prompt
App
Settings
Replace Command Prompt with Windows PowerShell in the Win
Manage app execution aliases
Search work and web
command prompt - See work and web results
Run as administrator
Open file location
Pin to Start
Pin to taskbar
Command Prompt
App
Open
Run as administrator
Open file location
Pin to Start
Pin to taskbar

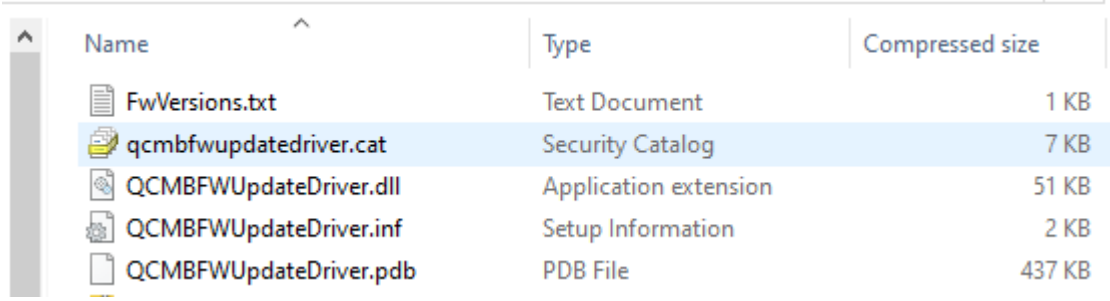


Use “netsh mbn show int” for current module firmware information

3.1.2.2 Download fota package

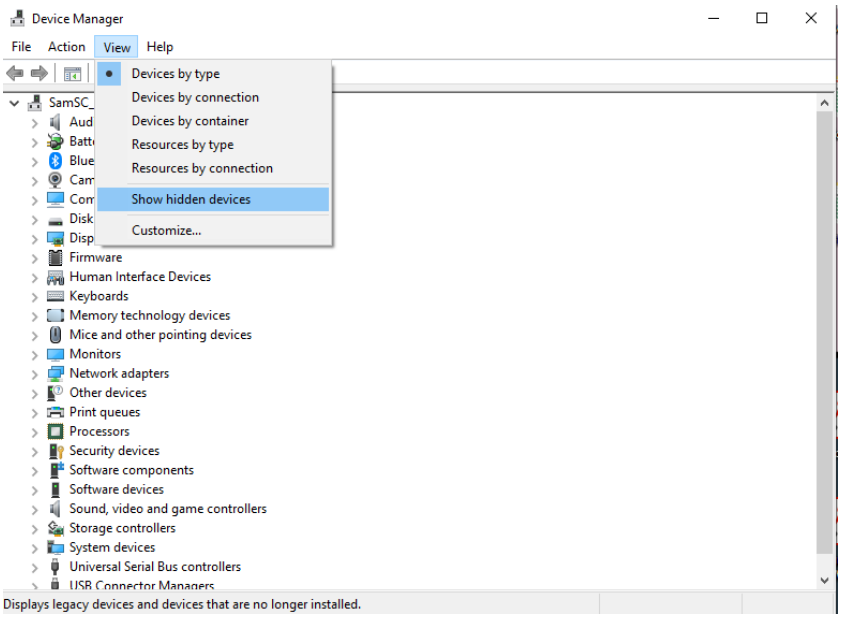
You can find firmware update driver package from https://www.tricascadeinc.com/vos-5g e.g. latest firmware is v69.

Download and unzip it to local directory.

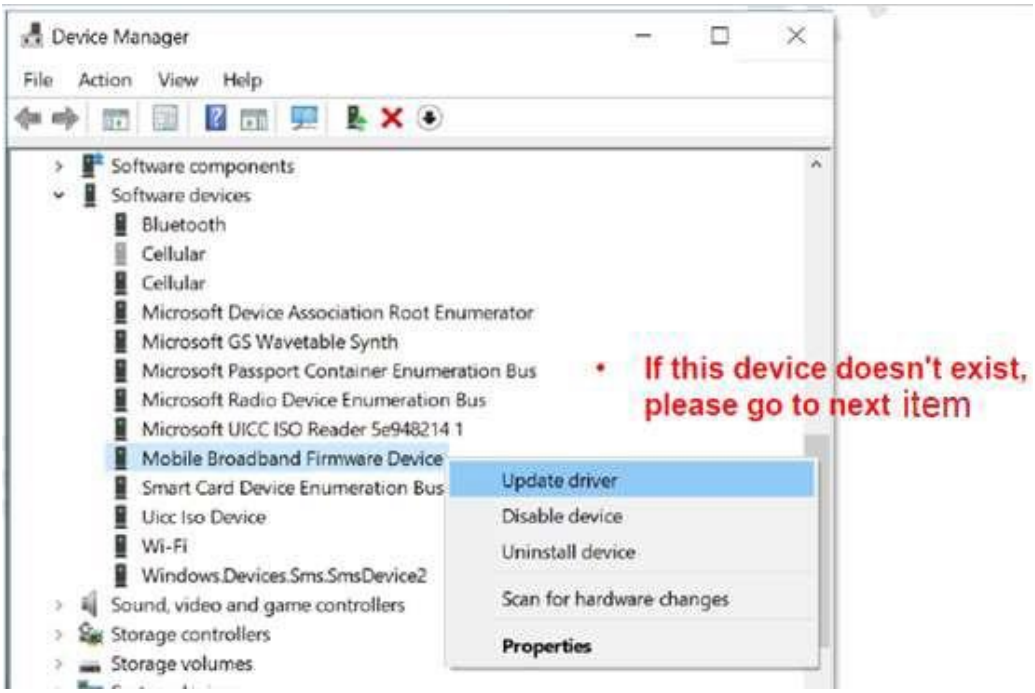


3.1.2.3 Setup firmware update driver package

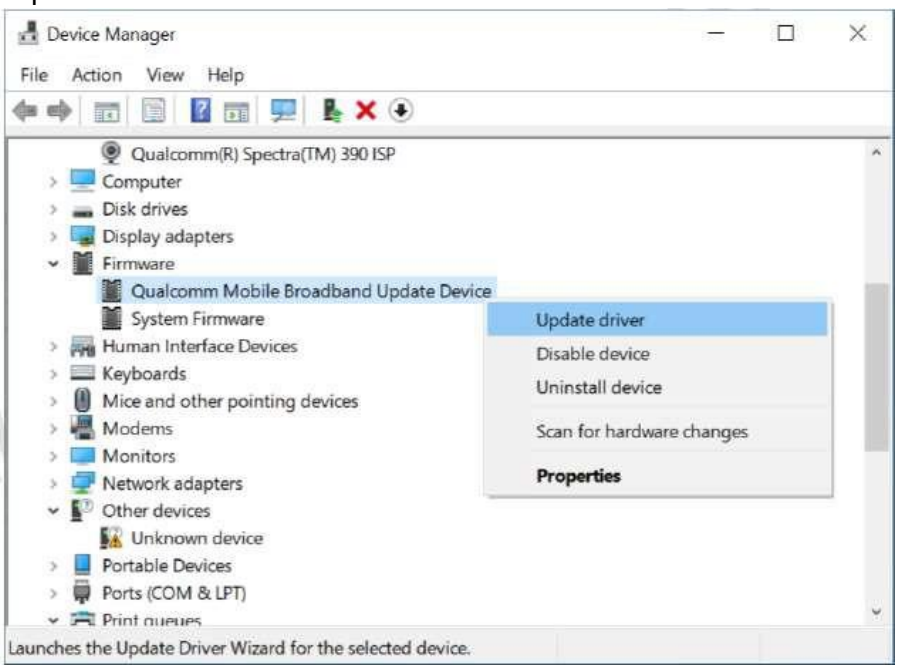
Open Device Manager, click “View” to select “Devices by type ”and click“ Show hidden devices”



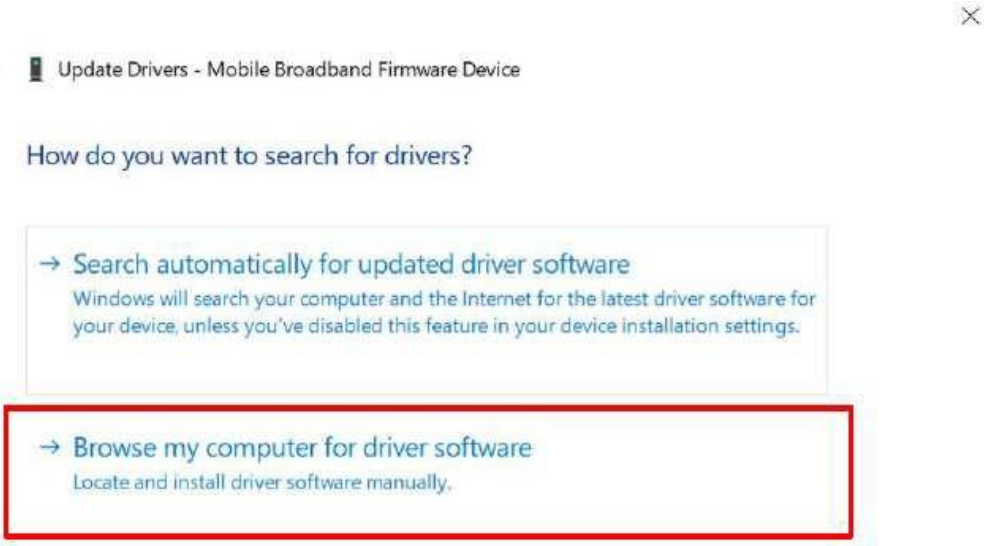
Go to “Software devices” session, right click on the “Mobile Broadband Firmware Device” and select “Update driver”.



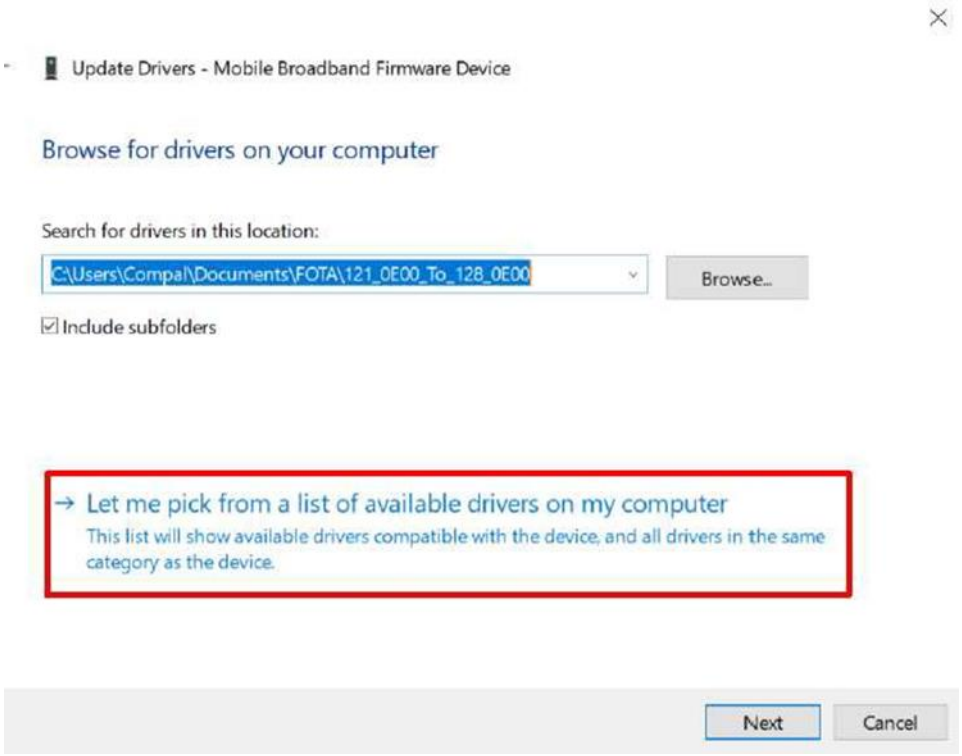
If “Mobile Broadband Firmware Device” doesn’t exist, please go to “Firmware” session, right click on the “Qualcomm Mobile Broadband Update Device” and select “Update driver”.



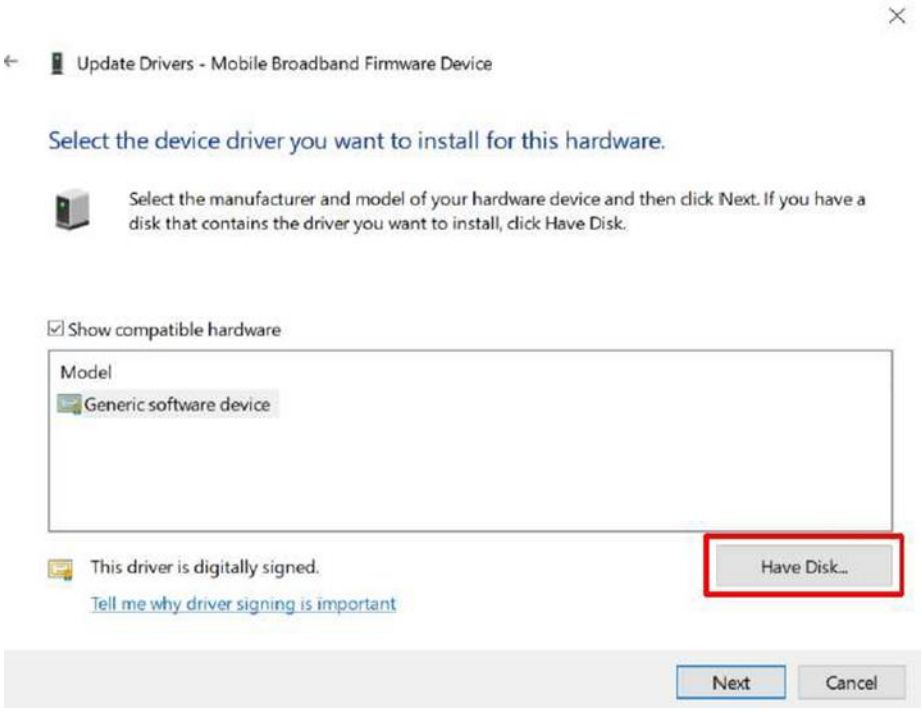
Select “Browse my computer for driver software”.



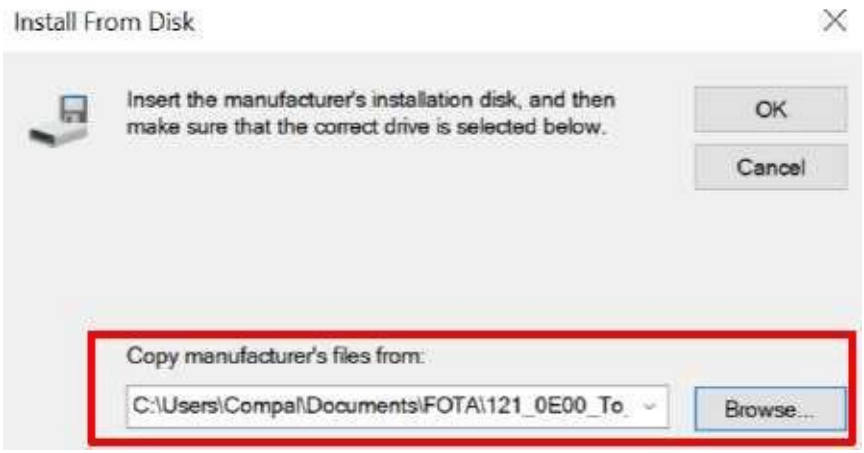
Select “Let me pick from a list of available drivers on my computer”



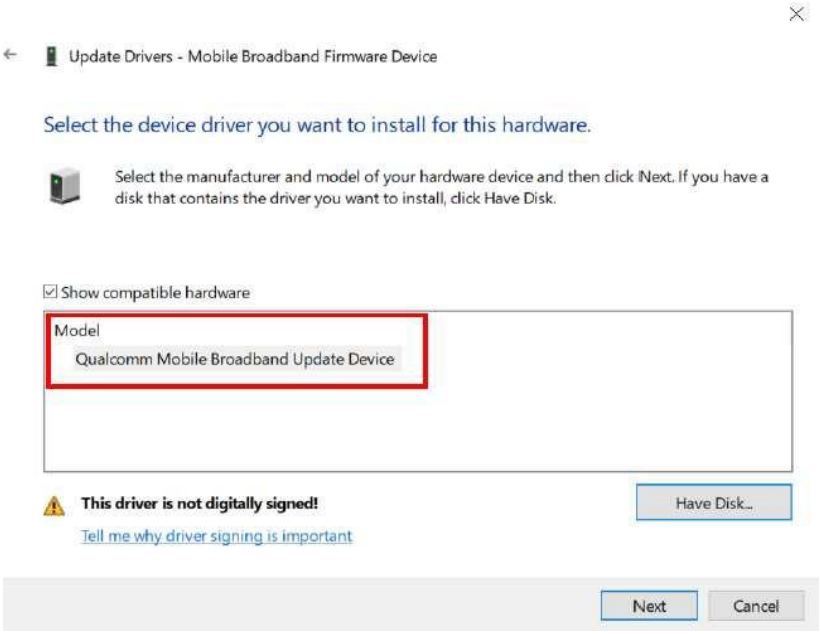
Select “Have Disk”



Select “Browse…” to Firmware Update Driver package path.

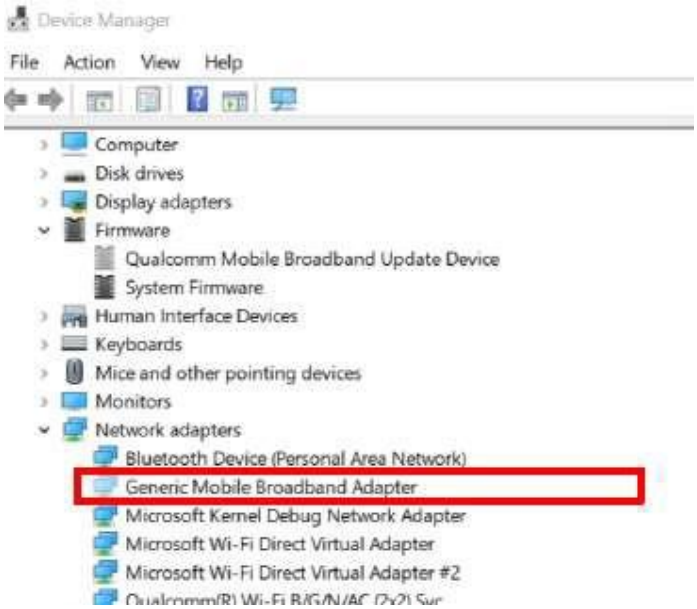


Select “Qualcomm Mobile Broadband Update Device” and click Next.



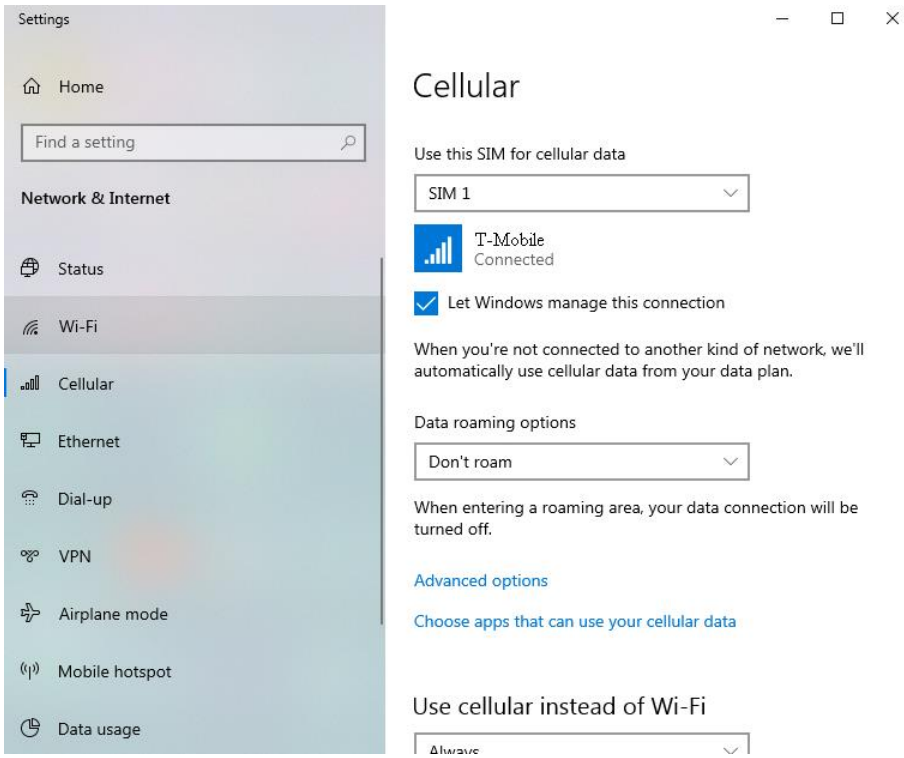
Wait for firmware update process to finish

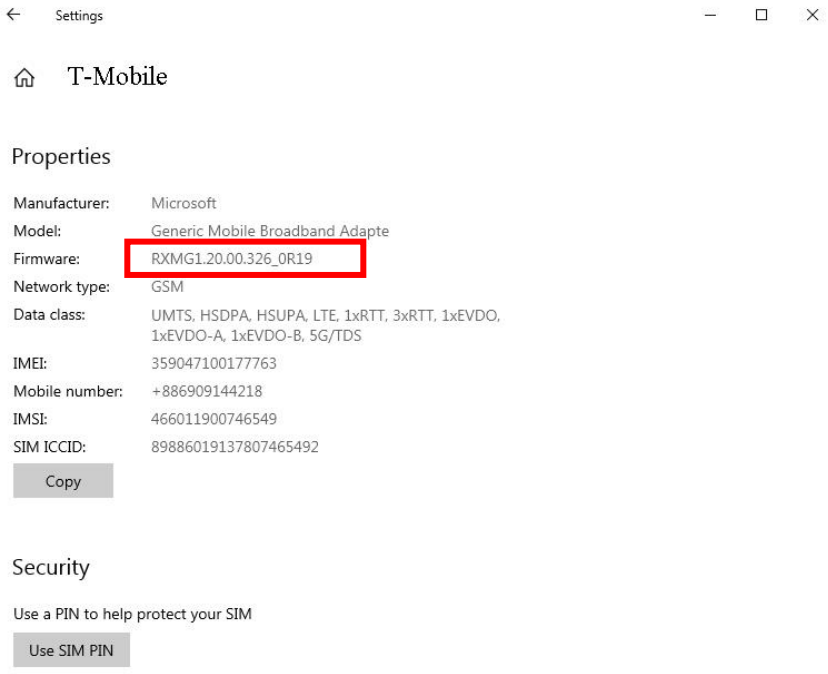
Open Device Manager, click “Network adapters”. Wait for Generic Mobile Broadband Adapter becomes hidden device.



Wait around 120s Generic Mobile Broadband Adapter will back to normal device and then please reboot PC. During firmware update, you can find red led on and green led blinking.

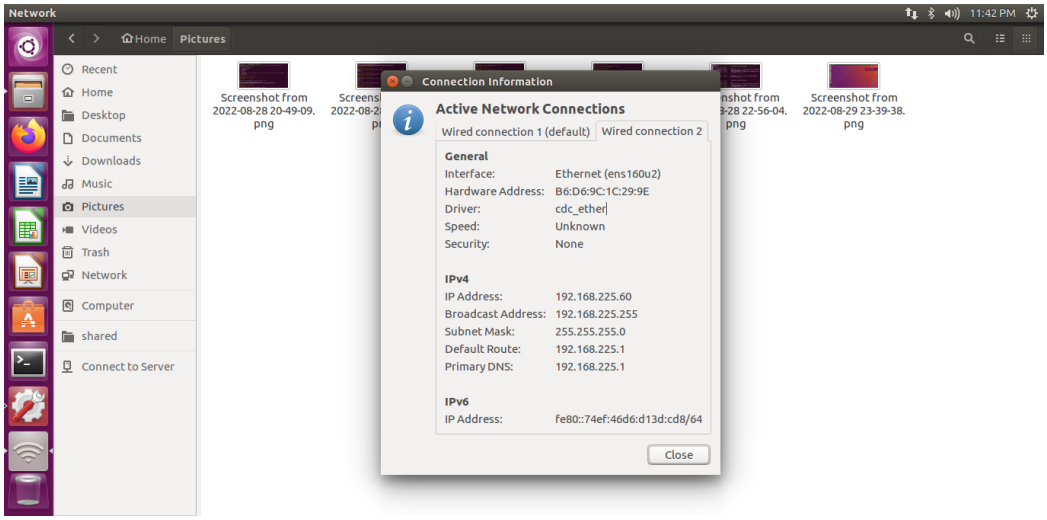
You can check the updated firmware version through windows UI like below


Settings
Home
Find a setting
Network & Internet
Status
Wi-Fi
Cellular
Ethernet
Dial-up
VPN
Airplane mode
Mobile hotspot
Data usage
Cellular
Use this SIM for cellular data
SIM 1
T-Mobile
Connected
Let Windows manage this connection
When you're not connected to another kind of network, we'll automatically use cellular data from your data plan.
Data roaming options
Don't roam
When entering a roaming area, your data connection will be turned off.
Advanced options
Choose apps that can use your cellular data
Use cellular instead of Wi-Fi
Always


Settings
T-Mobile
Properties
Manufacturer: Microsoft
Model: Generic Mobile Broadband Adapte
Firmware: RXMG1.20.00.326_0R19
Network type: GSM
Data class: UMTS, HSDPA, HSUPA, LTE, 1xRTT, 3xRTT, 1xEVDO, 1xEVDO-A, 1xEVDO-B, 5G/TDS
IMEI: 359047100177763
Mobile number: +886909144218
IMSI: 466011900746549
SIM ICCID: 89886019137807465492
Copy
Security
Use a PIN to help protect your SIM
Use SIM PIN

3.2 Host OS by Linux

Dongle will boot and register to network automatically after connect to host. You can see “Connection Established” after dongle boot up and see the connection detail by checking “Connection Information”.

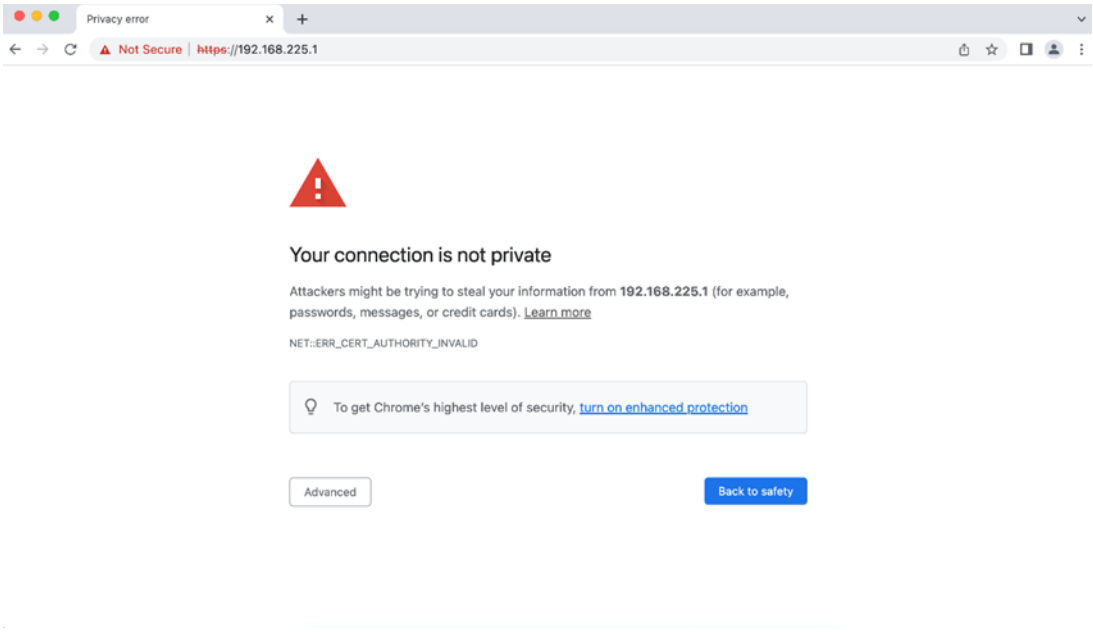


3.2.1 Configuration Utility

For connection management, we provide a WEB based configuration utility for users to customize connection configuration.

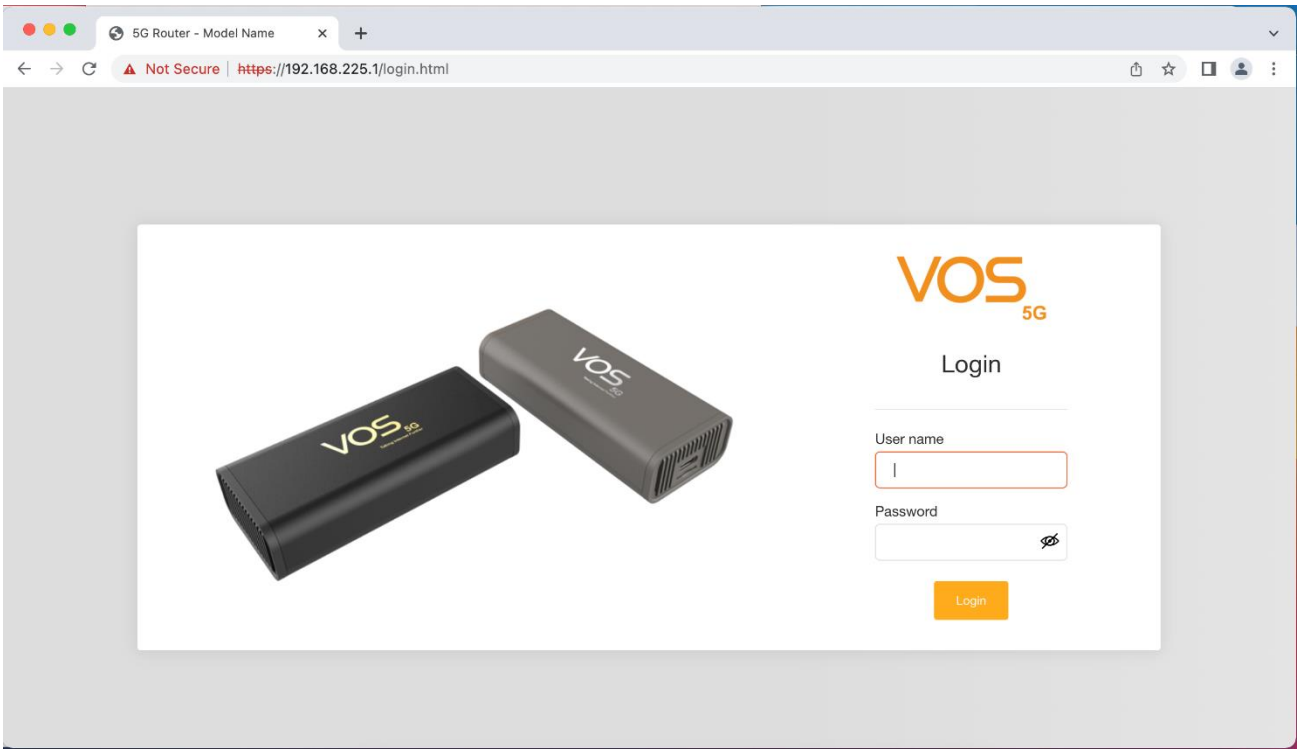
To access the configuration utility, open a web browser (such as Internet Explorer) and enter the IP address of the router, which is 192.168.225.1 by default.

Then the webpage might popup a warning page stated “ Your connection is not private”, please click the “Advanced” to access the configuration utility.



Once you have reached the configuration utility through your web browser, you will need to log in. Enter “admin” as the username, and then enter the password. By default, the password is “admin”.

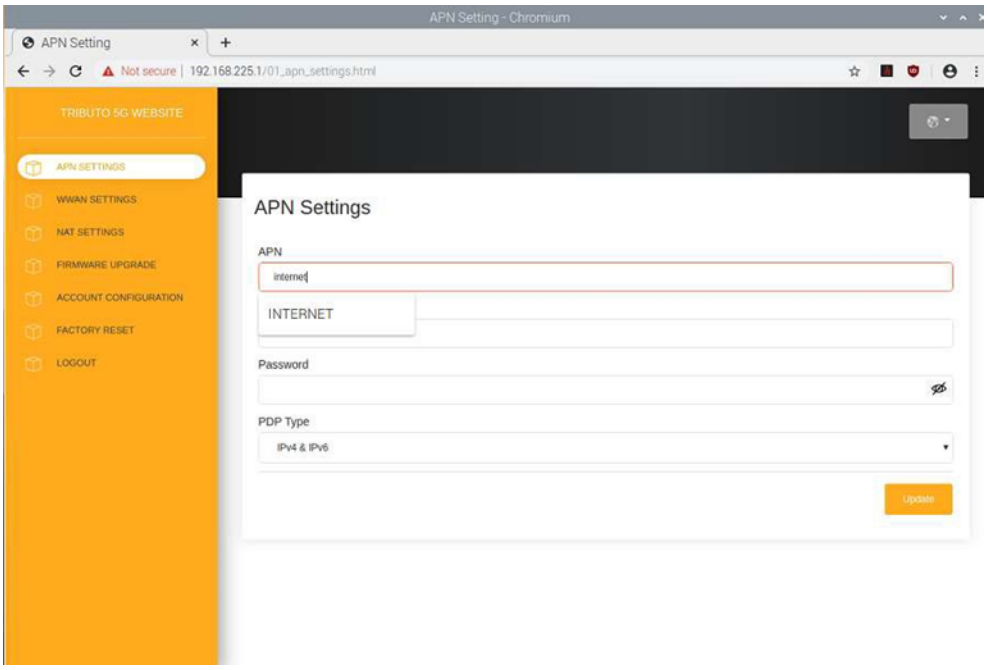
Click Login to continue



3.2.1.1 APN Settings

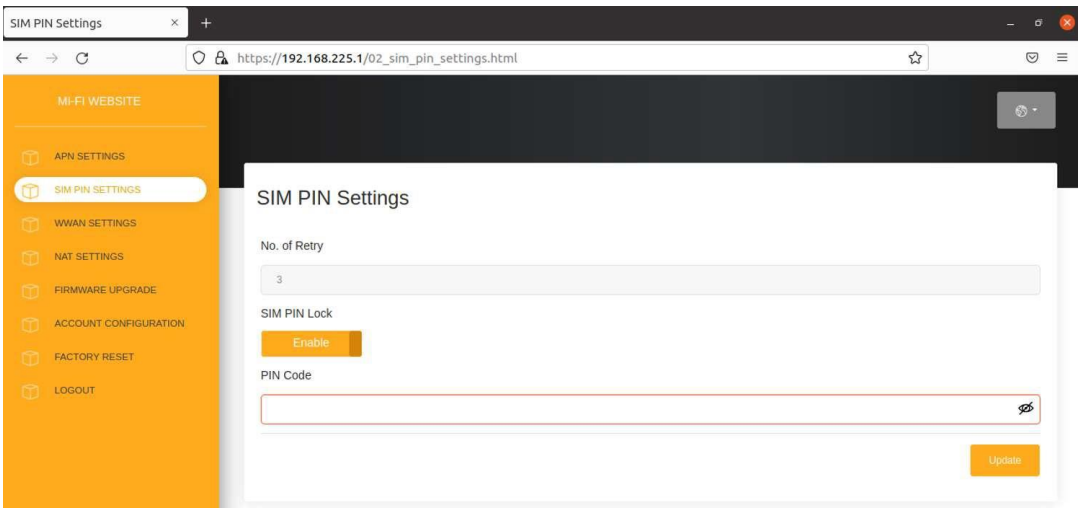
APN: Enter your service provider's APN.

User Name/Password: Enter the username and password provided by your service provider. PDP Type: Select PDP type (IPV4/IPV6/IPV4 & IPV6) that provided by your service provider.



3.2.1.2 SIM PIN Setting

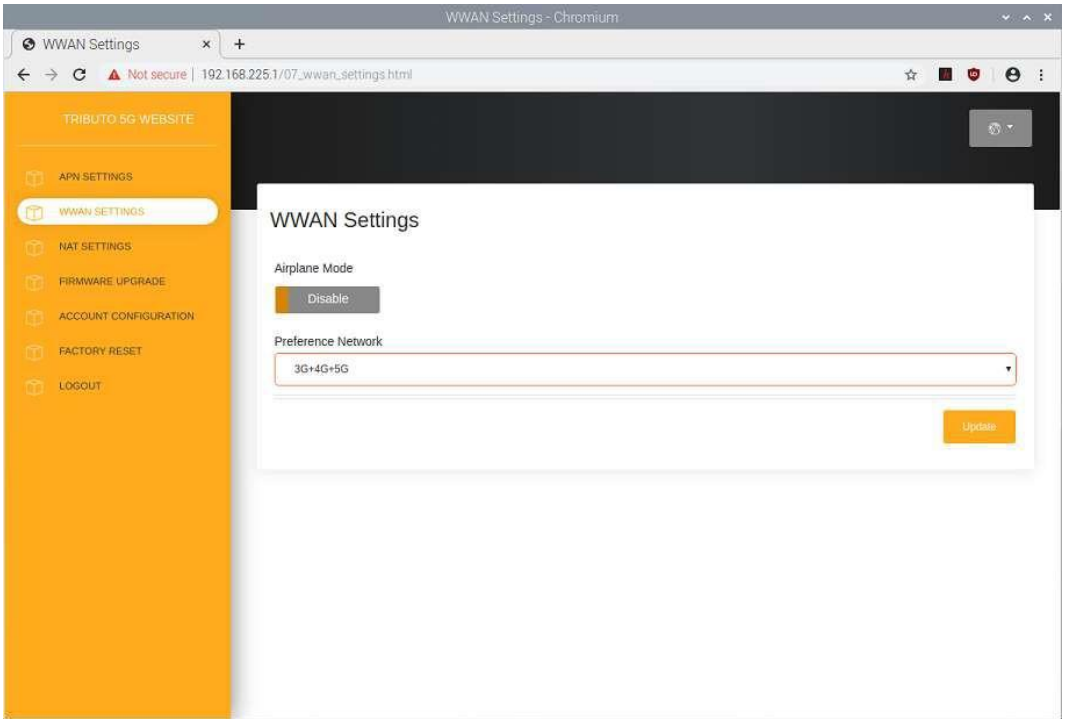
Enter SIM PIN code if your SIM is protected by PIN code. You can Disable SIM PIN Lock if you don't need this feature



3.2.1.3 WWAN Settings

Airplane Mode: Move the toggle to enable airplane mode.

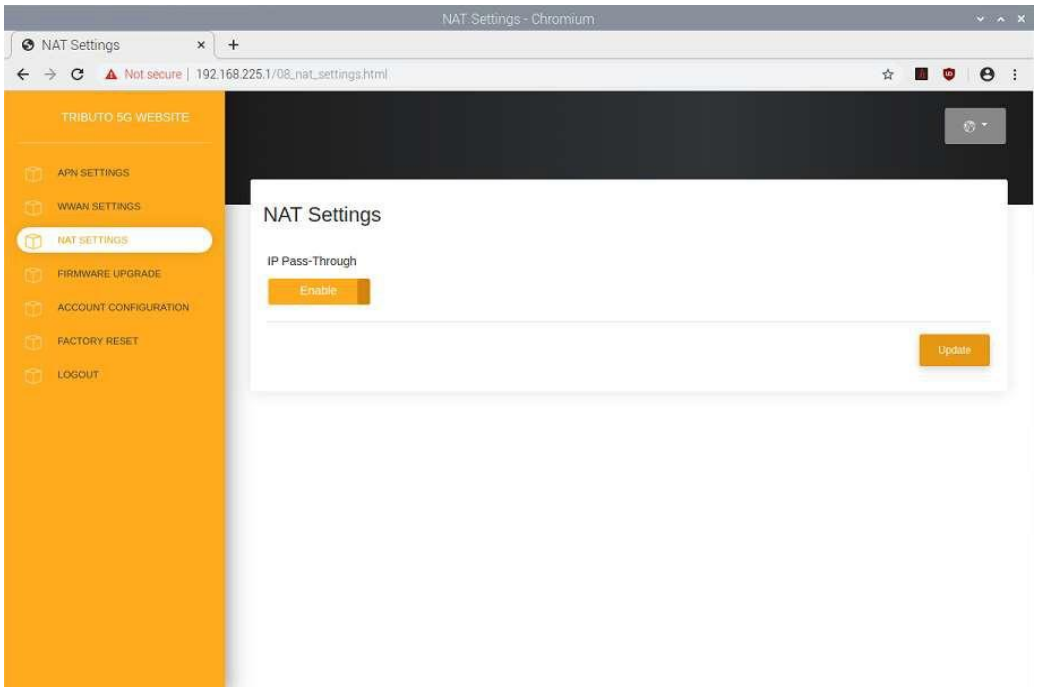
Preference Networks: Select network type (3G/4G/5G) combination that you prefer to use.



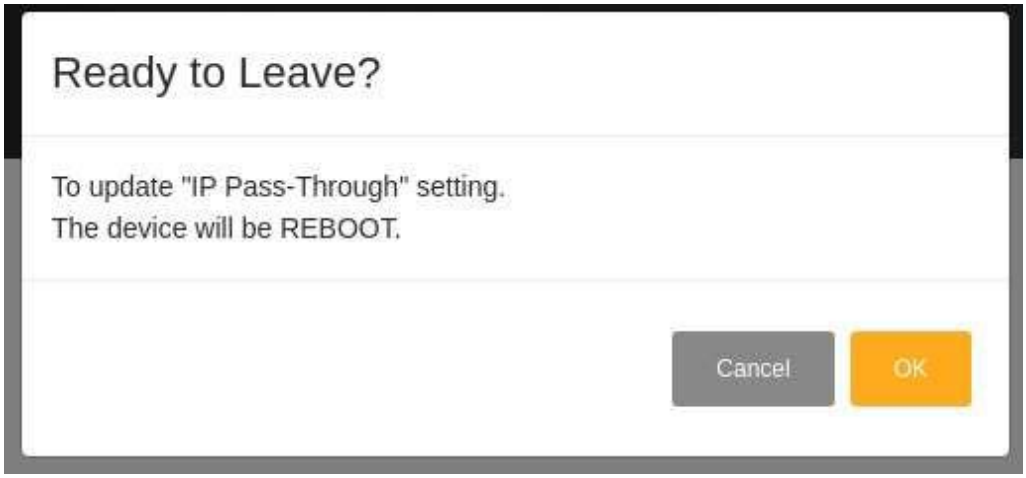
3.2.1.4 NAT Settings

IP Pass-Through: Please keep the IP Pass-Through as the “Disabled” for static IP address.

If you need to set as dynamic IP, please move the toggle to “enable” IP Pass-Through.



Dongle will reboot after enabled IP pass-through.



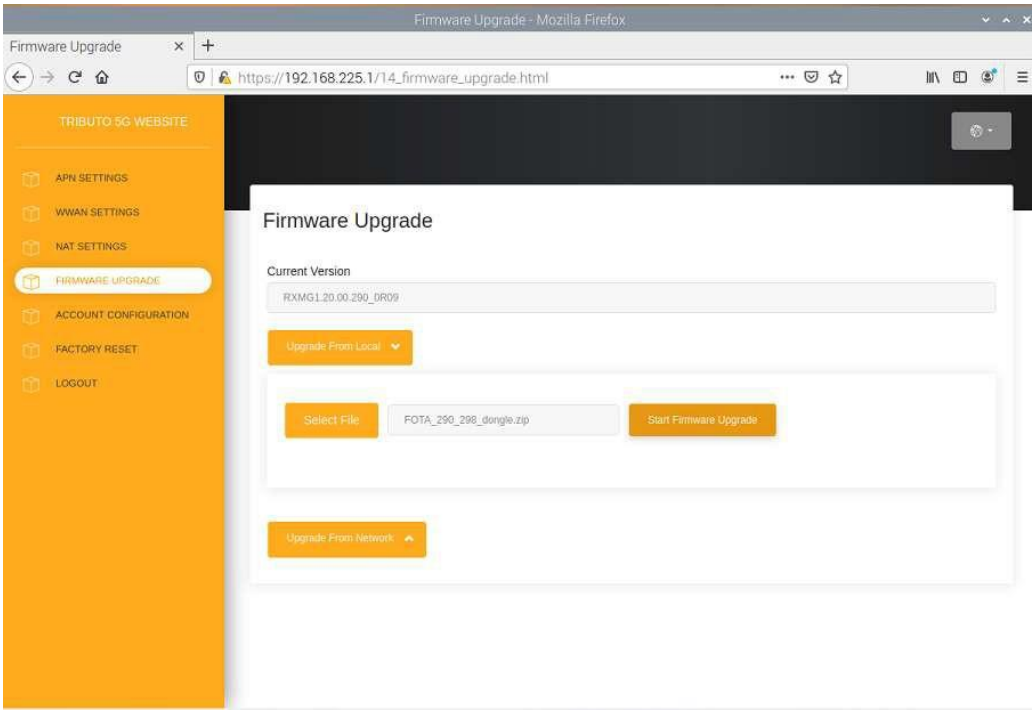
3.2.1.5 Firmware Upgrade

Current Version: Current Firmware version.

Upgrade From Local: Select a firmware update package from local.

Upgrade From Network: Checking server if there is new Firmware to upgrade. It will start to upgrade Firmware if there has a new version.

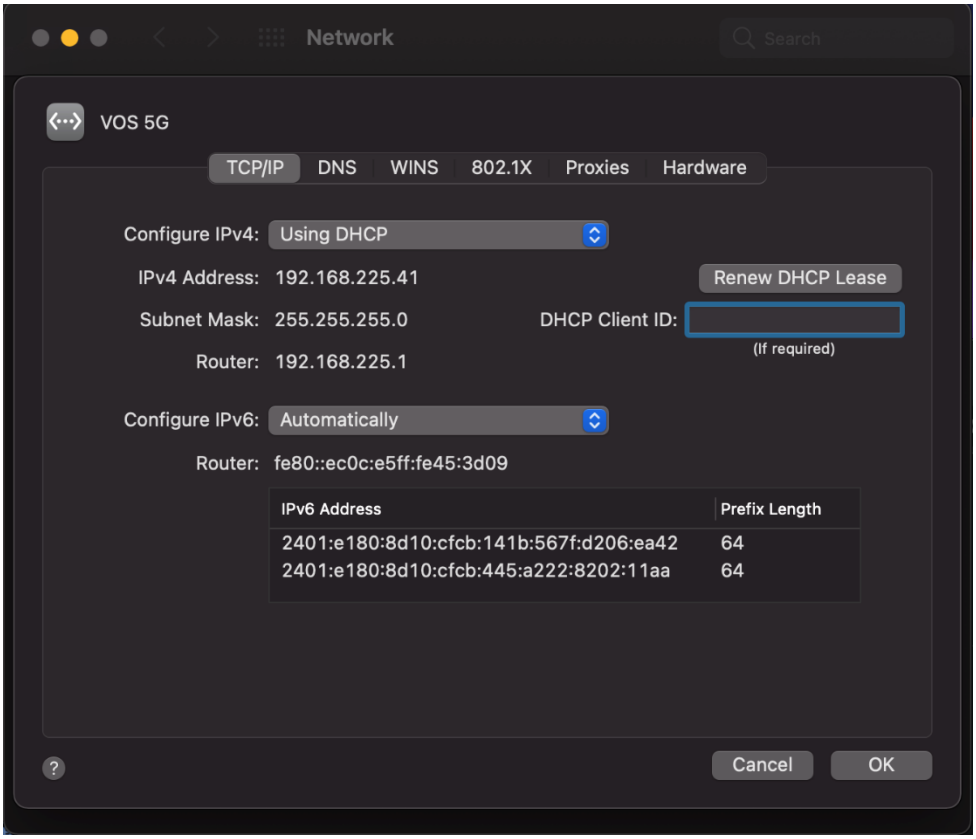
During firmware update, you can find red led on and green led blinking.



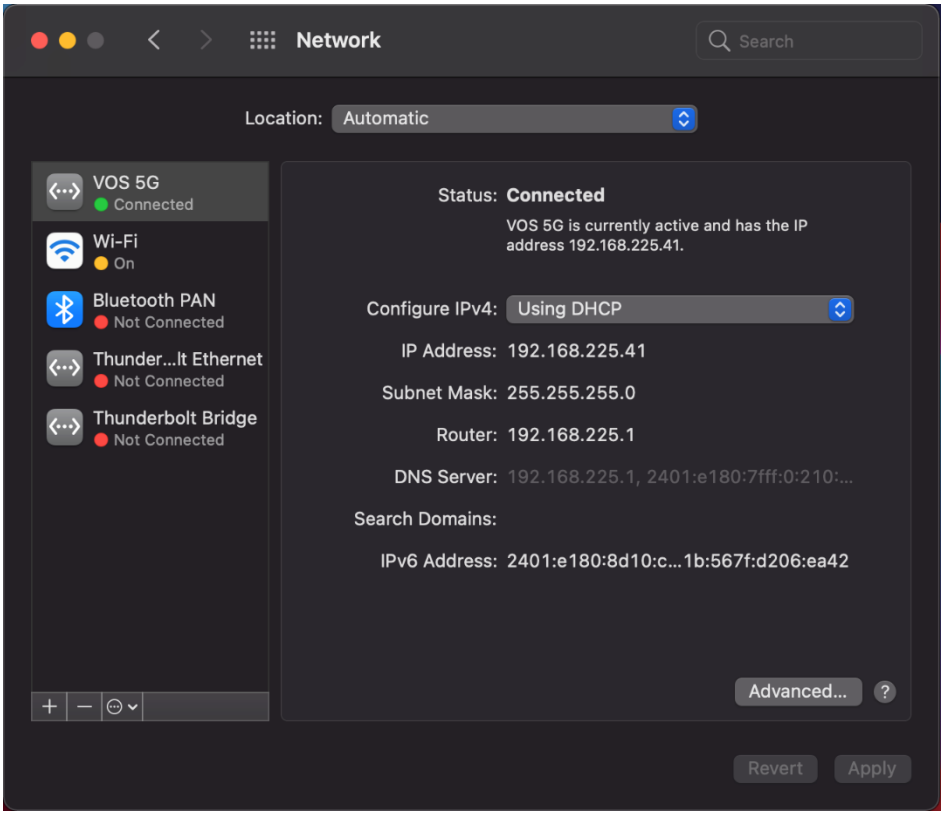
Logout: Logout Dongle settings

3.2.2 Host OS by Mac OS

VOS 5G Dongle will boot and register to network automatically after connect to host. You can see connection detail by checking “Network”, and check network configuration on “Advance”.



We provide WEB based configuration utility for Mac OS, you can refer to configuration utility section on Linux chapter for detail.



FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

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.

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

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: 2ACARVOS5GC ".

RF Exposure warning

This device meets the government’s requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg. Tests for SAR are conducted using standard operating positions accepted by the FCC with the EUT transmitting at the specified power level in different channels.

To ensure that RF exposure levels remain at or below the tested levels, use a belt-clip, holster, or similar accessory that maintains a minimum separation distance of 5mm between your body and the device.

SAR compliance of this product has only been verified for use with typical laptop computers.
To comply with RF exposure limits, user must not simultaneously operate wireless products in adjacent USB-ports or cardbus slots.