VT-USB-CELL
USB Cellular Dongle



User Manual

Version: 1.3

© Vantron Technology, Inc. All rights reserved.

Revision History:

No.	Version	Description	Date
1	V1.0	First release	Agu. 20, 2025
2	V1.1	Updated the AT commands	Oct. 13, 2025
3	V1.2	Modified the local IP address of the card	Jan. 7, 2026
4	V1.3	1. Updated commands AT#GETMM & AT#HTBTADD; 2. Added AT commands: AT#MATMODE, AT#MSIMSLOT, AT#MMTUMRU, AT#MSYSLOG, AT^NDISCFG, AT^NDISACT	Sep. 18, 2026

Table of Contents

Foreword 1

CHAPTER 1 INTRODUCTION 5

1.1 Product Overview 6

1.2 Features 6

1.3 Specifications 7

1.4 Mechanical Outline 7

1.5 Product Layout 8

1.6 Terminology/Acronym 8

CHAPTER 2 GETTING STARTED 9

2.1 Carrier SIM Registration 10

2.2 Setting up the Dongle 10

2.2.1 Hardware Installation 10

2.2.2 Powering up the Dongle 11

2.2.3 Prerequisites for Software Setup 11

2.3 Using the Dongle on Windows 12

2.3.1 Serial AT Command Console 12

2.3.2 Telnet Access to the Dongle System 13

2.4 Using the Dongle on Linux 15

2.4.1 Enabling Required Drivers for Linux Hosts 15

2.4.2 Identifying the Enumerated Device Names 16

2.4.3 Establishing Network Connection on Linux Hosts 17

2.4.3.1 Manual AT Setup for RNDIS Connection 17

2.4.3.2 Automatic AT Setup for RNDIS Connection 20

2.4.3.3 RNDIS Adapter Setup 22

2.4.3.4 Accessing the RNDIS Network 23

2.4.3.5 Disconnecting the RNDIS Connection 24

CHAPTER 3 AT COMMANDS 26

3.1 General AT Commands 27

3.2 Device-level Commands 28

3.3 Network Setup Commands 33

CHAPTER 4 DISPOSAL AND WARRANTY 47

4.1 Disposal 48

4.2 Warranty 49

Appendix Regulatory Compliance Statement 50

Foreword

Thank you for purchasing Vantron VT-USB-CELL USB Cellular Dongle ("the dongle" or "the Product"). This manual intends to provide guidance and assistance necessary on setting up, operating or maintaining the Product. Please read this manual and make sure you understand the structure and functionality of the Product before putting it into use.

Intended Users

This manual is intended for:

- Network architects/administrators
- Technical support engineers
- Embedded/software development engineers
- Other users

Copyright

Vantron Technology, Inc. ("Vantron") reserves all rights of this manual, including the right to change the content, form, product features, and specifications contained herein at any time without prior notice. An up-to-date version of this manual is available at www.vantrontech.com.

The trademarks in this manual, registered or not, are properties of their respective owners. Under no circumstances shall any part of this user manual be copied, reproduced, translated, or sold. This manual is not intended to be altered or used for other purposes unless otherwise permitted in writing by Vantron. Vantron reserves the right of all publicly-released copies of this manual.

Disclaimer

While all information contained herein has been carefully checked to assure its accuracy in technical details and typography, Vantron does not assume any responsibility resulting from any error or features of this manual, nor from improper uses of this manual or the software.

It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without notice.

Technical Support and Assistance

Should you have any question about the Product that is not covered in this manual, contact your sales representative for solution. Please include the following information in your question:

- Product name and PO number
- Complete description of the problem
- Error message showing on the device, if any

Vantron Technology, Inc.

Address: 48434 Milmont Drive, Fremont, CA 94538

Tel: (650) 422-3128

Email: sales@vantrontech.com

Regulatory Information

The Product is designed to comply with:

- FCC

Please refer to **Appendix** for Regulatory Compliance Statement.

Symbology

This manual uses the following signs to prompt users to pay special attention to relevant information.

⚠	Caution for latent damage to system or harm to personnel
	Attention to important information or regulations

General Safety Instructions

The Product is supposed be installed by knowledgeable, skilled persons familiar with local and/or international electrical codes and regulations. For your safety and prevention of damage to the Product, please read and observe carefully the following safety instructions prior to installation and operation. Keep this manual well for future reference.

- Do not disassemble or otherwise modify the Product. Such action may cause heat generation, ignition, electronic shock, or other damages including human injury, and may void your warranty.
- Keep away from heat source, such as heater, heat dissipater, or engine casing.
- Do not insert foreign materials into the openings of the Product as it may cause the Product to malfunction or burn out.
- Use only the adapter and power cord that are approved for use with this Product. Otherwise, it may cause fire or explosion.
- Be sure that nothing rests on the power cable and that the cable is located at a place without risk of trips.
- Cut off the power before inspection of the Product to avoid human injury or product damage.

Precautions for Power Cables and Accessories

⚠ Use proper power source only. Make sure the supply voltage falls within the specified range.

⚠ Place the power cable properly at places without extrusion hazards.

⚠ Cleaning instructions:

- Power off before cleaning the Product
- Do not use caustic or aggressive liquids, vapor, or spray
- Clean with a damp cloth
- Do not try to clean exposed electronic components unless with a dust collector

⚠ Power off and contact Vantron technical support engineer in case of the following faults:

- The Product is damaged
- The temperature is excessively high
- Fault is still not solved after troubleshooting according to this manual

⚠ Do not use in combustible and explosive environment:

- Keep away from combustible and explosive environment
- Keep away from all energized circuits
- Unauthorized removal of the enclosure from the device is not allowed
- Do not change components unless the power cable is unplugged
- In some cases, the device may still have residual voltage even if the power cable is unplugged. Therefore, it is a must to remove and fully discharge the device before replacement of the components.

CHAPTER 1 INTRODUCTION

1.1 Product Overview

The VT-USB-CELL USB cellular dongle integrates the Rockchip RK3308GK quad core ARM Cortex A35 processor clocked at 1.2 GHz, delivering low-power performance and high stability. The unit comes with built-in 64MB DDR2 RAM and 32MB SPI flash. This ensures smooth system operation and reliable persistent storage for firmware and configuration data.

It integrates an LTE Cat-4/Cat-1 cellular module supporting LTE-FDD, covering prevalent frequency bands with broad compatibility. It delivers downlink throughput of 10 Mbps (LTE Cat 1) and 150 Mbps (LTE Cat 4), alongside uplink throughput of 5 Mbps (LTE Cat 1) and 50 Mbps (LTE Cat 4), satisfying requirements for efficient network connectivity. Two dedicated 4G LTE antenna connectors are fitted to boost signal reception, extend network coverage, and strengthen link stability.

A single USB Type B port enables easy connection to the host device for fast network bring up and system debugging. An on-board Micro SIM card slot is provided for 4G service activation. Compact in form factor, the device combines industrial-grade robustness and portability, suited for use cases including industrial control and outdoor networking deployments.

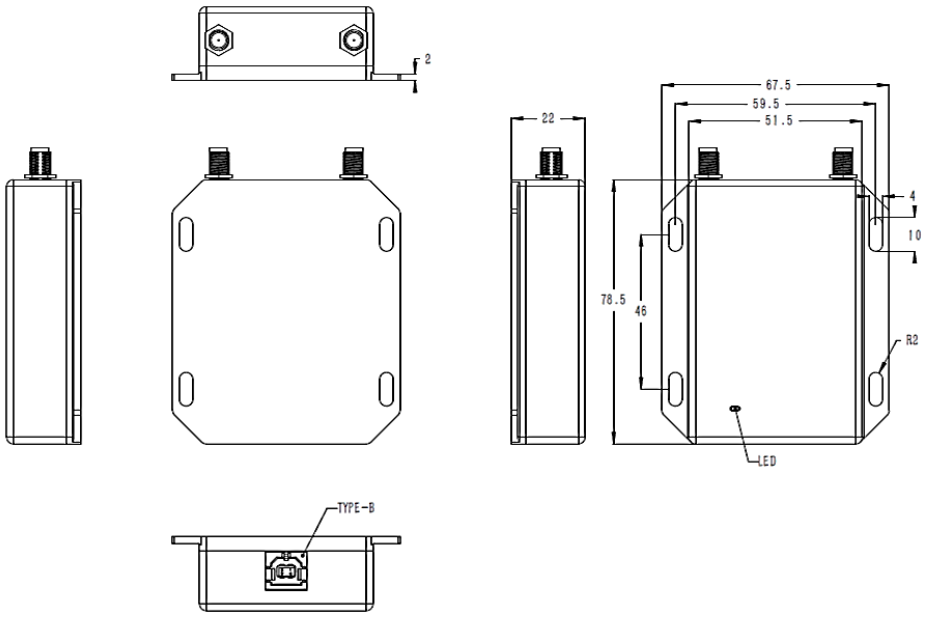
1.2 Features

- LTE-FDD bands (Cat-1): B2/B4/B5/B12/B13/B66
- LTE-FDD bands (Cat-4): B2/B4/B5/B12/B13/ B25/B26
- Max. data rate (Cat-1): 10 Mbps (downlink), 5 Mbps (uplink)
- Max. data rate (Cat-4): 150 Mbps (downlink), 50 Mbps (uplink)
- Power input: 5V DC
- Power consumption: ~3.5W
- Dimensions: 78.5mm × 67.5mm × 22mm (not including antenna connectors)
- Operating temperature: 0°C ~ +70°C
- Control via AT command set

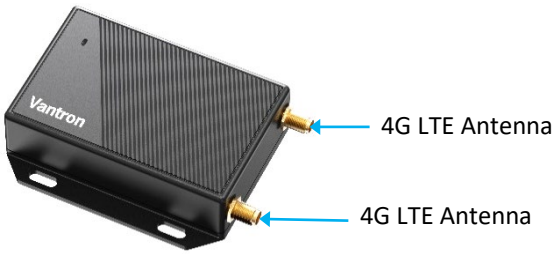
1.3 Specifications

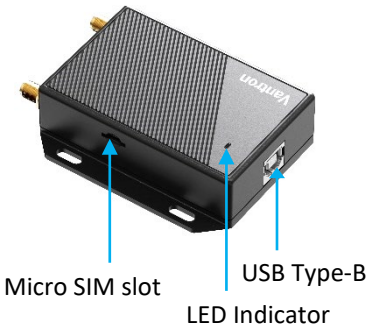
VT-USB-CELL		
System	CPU	Rockchip RK3308GK, quad-core ARM cortex-A35, up to 1.2GHz
	Memory	64MB DDR2
		32MB SPI Flash
Communication	Max. data rate	LTE Cat-1, 10 Mbps (Downlink) & 5 Mbps (Uplink)
		LTE Cat-4, 150 Mbps (Downlink) & 50 Mbps (Uplink)
	Frequency Band	LTE-FDD (Cat-1): B2/4/5/12/13/66
		LTE-FDD (Cat-4): B2/4/5/12/13/25/26
		WCDMA (Cat-4): B2/4/5
I/O	USB	1 × USB 2.0 Type-B
	Antenna	2 × 4G/LTE antenna
	SIM	1 × Micro SIM card slot
System Control	LED Indicator	1 × Power indicator
Power	Input	5V (±5%) DC
	Consumption	~3.5W
Mechanical	Dimensions	78.5mm × 67.5mm × 22mm (not including antenna connectors)
	Enclosure	Plastic
Environmental Condition	Temperature	Operating: 0°C ~ +70°C
	Certification	FCC, CE, PTCRB

1.4 Mechanical Outline



1.5 Product Layout





1.6 Terminology/Acronym

Terminology/Acronym	Description
Dongle/Cellular dongle	The VT-USB-CELL cellular dongle
Host device	The device that connects the VT-USB-CELL for cellular connectivity (Windows host & Linux host supported)
Build host	A machine used to configure and rebuild the host device's kernel with RNDIS and CDC-ACM drivers enabled
RNDIS	Remote Network Driver Interface Specification
TE	Terminal equipment
PDP	Packet Data Protocol
PDN	Packet Data Network
MT	Mobile Terminal
APN	Access Point Name
NVM	Non-Volatile Memory
MTU	Maximum Transmit Unit
MRU	Maximum Receive Unit

CHAPTER 2 GETTING STARTED

2.1 Carrier SIM Registration

Two models are available for the VT-USB-CELL: VT-Dongle-LTE1T and VT-Dongle-LTE4Q.

When requesting a SIM card from a carrier or registering on the carrier's portal where applicable, provide the name of the pre-certified cellular module: **VT-MOB-LTE1T-PB** for VT-Dongle-LTE1T and **VT-MOB-LTE4Q-PB** for VT-Dongle-LTE4Q.

2.2 Setting up the Dongle

2.2.1 Hardware Installation

1. Mount the dongle on a flat surface with two screws through the side flanges, keeping the USB port and SIM slot accessible.

2. Install two cellular antennas to the SMA female connectors on the dongle.





3. Insert the activated SIM card into the Micro SIM slot, with the gold contacts facing down.



2.2.2 Powering up the Dongle

The cellular dongle is powered through the USB port.

1. Use a USB-A to USB-B cable to connect the dongle to a host device that provides a USB 2.0 Type-A port with 5V DC output (≥500 mA continuous, ≥700 mA peak).
2. After connection, it takes about 1-2 minutes for the system to reach normal operation. Verify that the power LED turns solid on.

2.2.3 Prerequisites for Software Setup

Before using the cellular dongle, ensure the following:

- The host OS image must have RNDIS networking and CDC-ACM virtual serial drivers enabled.

  With these drivers enabled, the host OS can recognize the cellular dongle over the USB port and enumerate a CDC-ACM serial port and an RNDIS network interface.

- For serial console access, PuTTY or MobaXterm is recommended for Windows hosts, minicom or microcom is recommended for Linux hosts.

  *Serial console parameters: **115200 8N1** (115200 baud, 8 data bits, no parity, 1 stop bit).*

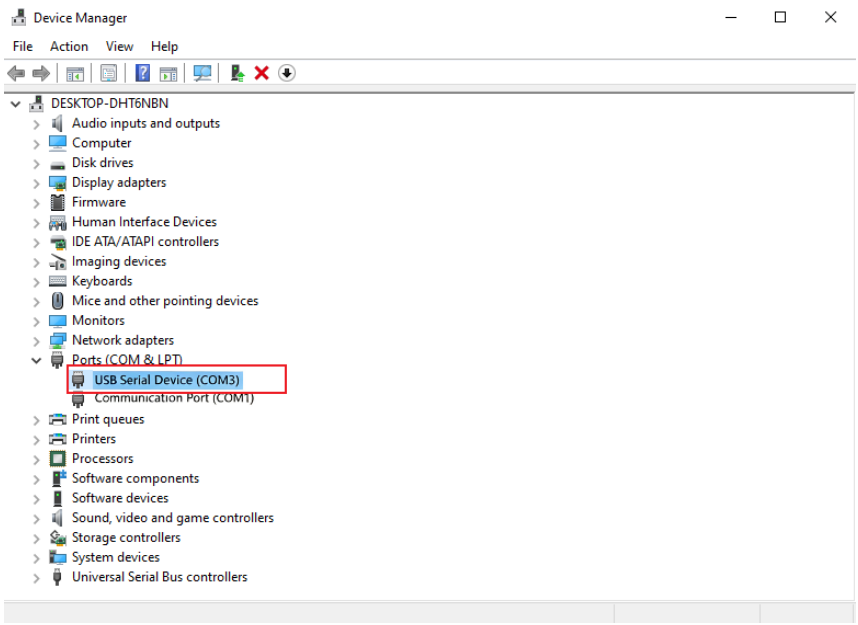
2.3 Using the Dongle on Windows

Windows OS images typically include native RNDIS and CDC-ACM drivers. No driver installation is required.

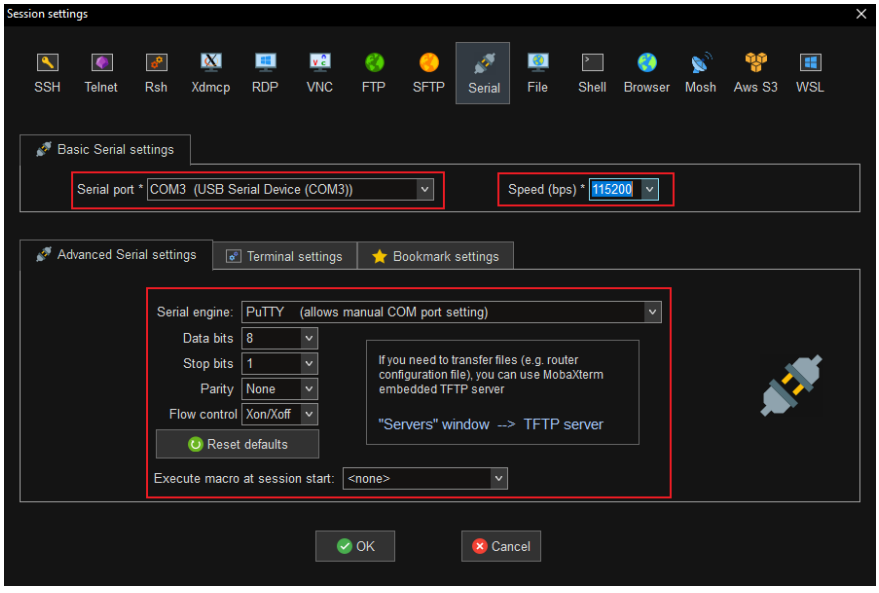
2.3.1 Serial AT Command Console

To send AT commands to the cellular dongle on a Windows host:

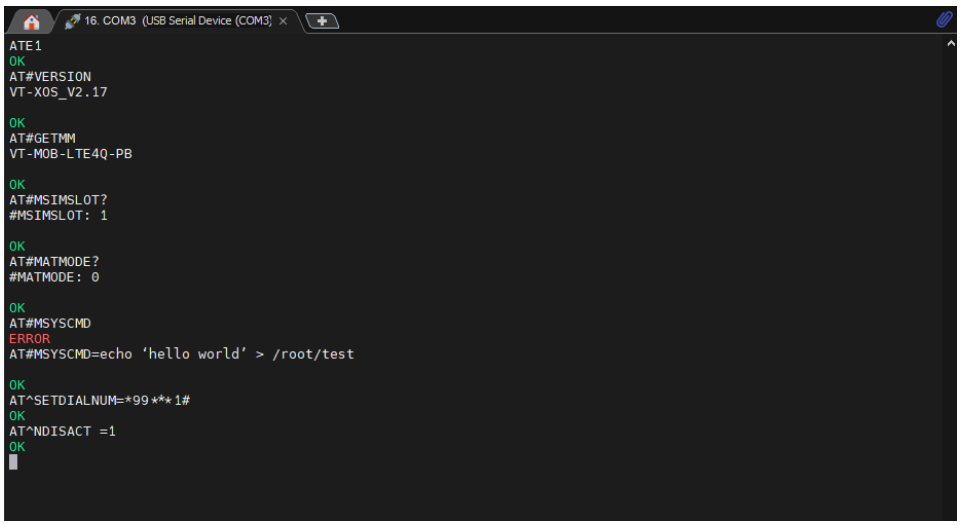
1. Connect the dongle to the Windows host via a USB-A to USB-B cable.
2. Open **Device Manager** and locate the dongle under **Ports (COM & LPT)**.



3. Open a serial terminal program (e.g., PuTTY, MobaXterm) and connect to the dongle using the COM port identified in Step 2 and the parameters **115200 8N1**.

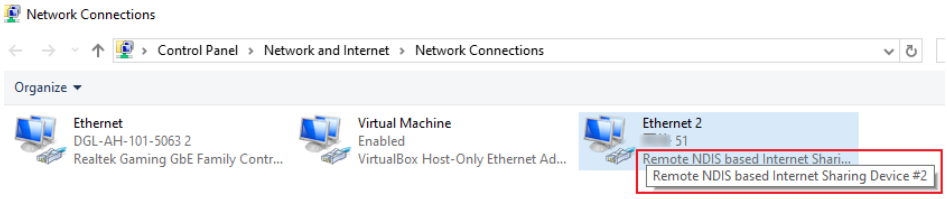


4. Enable local echo with ATE1, then use the AT commands described in Section 3.3 to dial up for network connection and query the status.

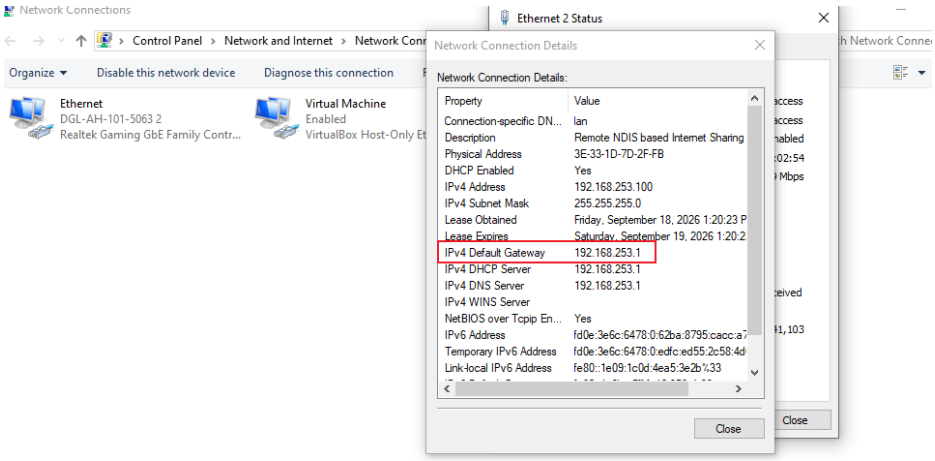


2.3.2 Telnet Access to the Dongle System

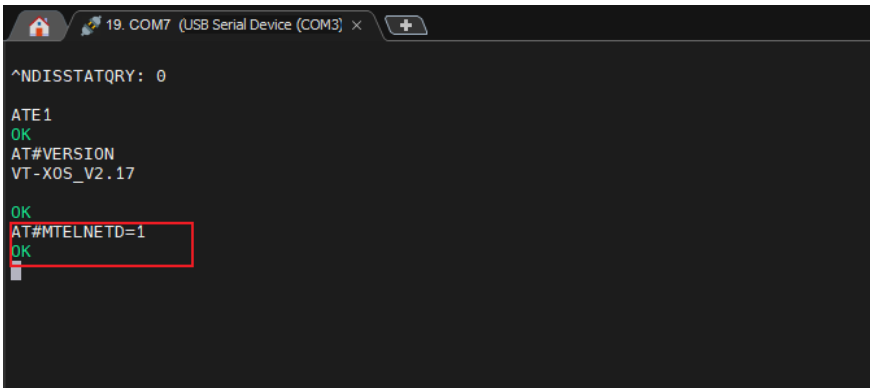
1. Connect the dongle to the Windows host via a USB-A to USB-B cable.
2. Open **Network & Internet Settings** and view the RNDIS network adapter's details.



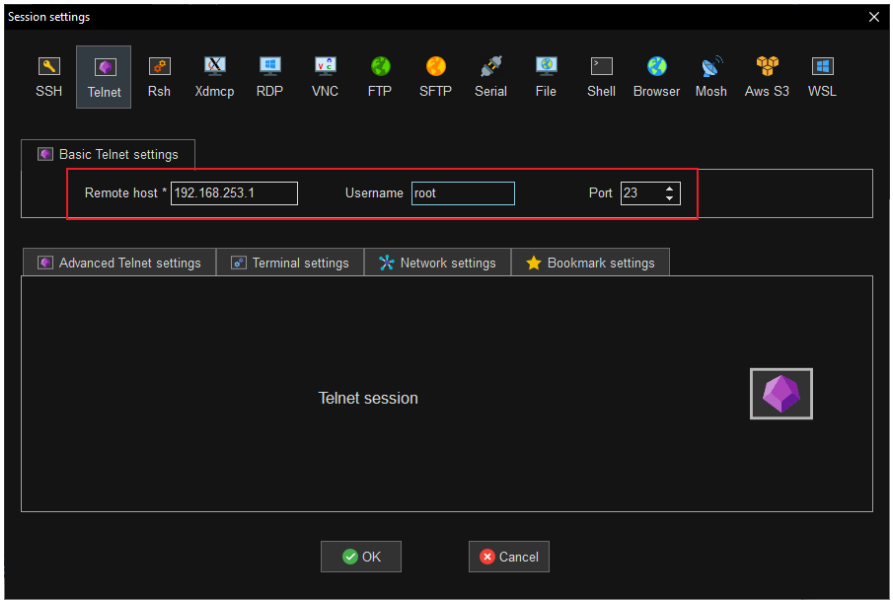
3. Retrieve the default gateway of the RNDIS adapter, which is the dongle's IP address (e.g., 192.168.253.1).

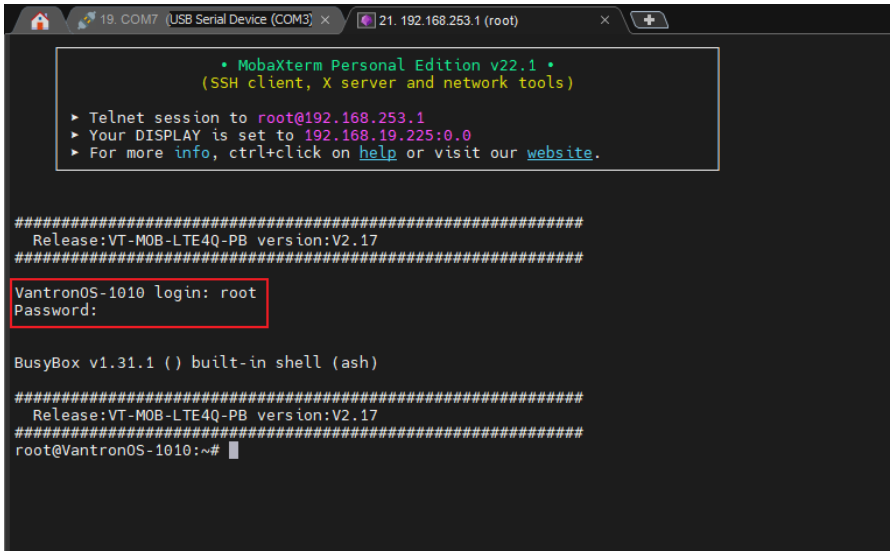


4. Enable the Telnet service on the dongle via the serial AT command: AT#MTELNETD=1.



5. Open a Telnet client and log in to the dongle using the IP address retrieved in step 3 (default username: root, default password: admin). After logging in, you can access the dongle's Linux shell for further configuration and debugging.





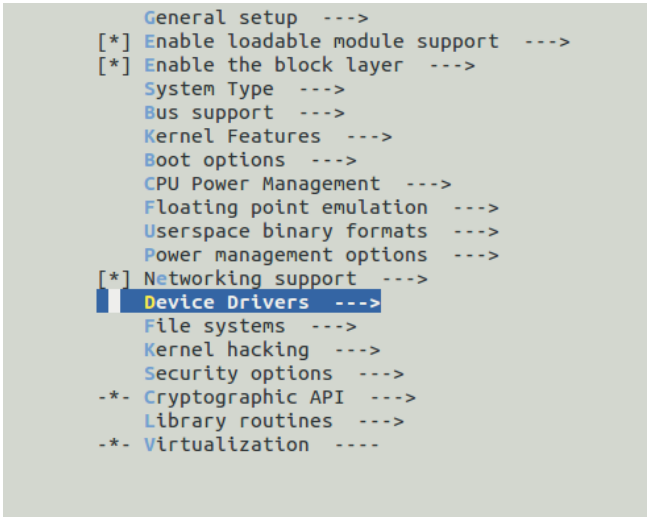
2.4 Using the Dongle on Linux

Most embedded Linux OS images do not include RNDIS and CDC-ACM drivers by default. To enable the drivers for your target Linux device, configure and rebuild its kernel on a build host.

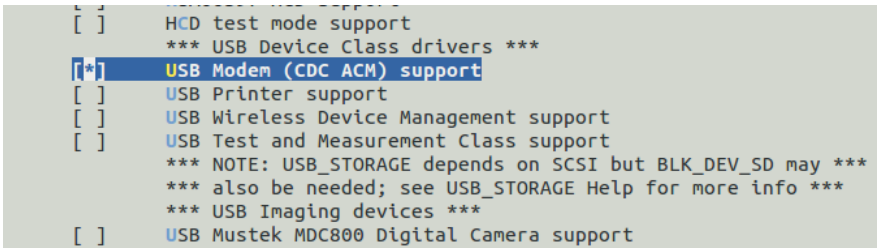
2.4.1 Enabling Required Drivers for Linux Hosts

1. On the build host, enter the target Linux device's kernel source code directory.
2. Run the following command to open the kernel configuration menu:

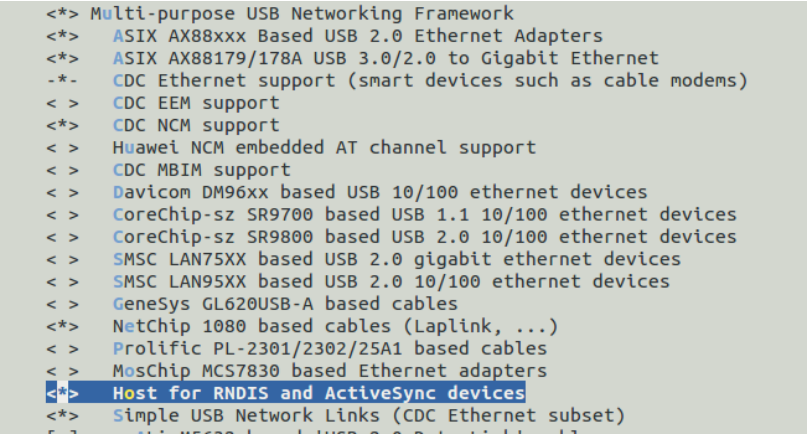
```
make menuconfig
```



3. Select **Device Drivers** --> **USB support** --> **USB Modem (CDC ACM) support**, then return to **Device Drivers**.



4. Select **Network device support** --> **USB Network Adapters** --> **Multi-purpose USB Networking Framework**, then enable **Host for RNDIS and ActiveSync devices**.



5. Save and exit the configuration menu.
6. Deploy the rebuilt kernel or the generated .ko modules to the target Linux device, then reboot it.

2.4.2 Identifying the Enumerated Device Names

After enabling the required drivers on the target Linux host, verify that the drivers function properly.

1. Connect the cellular dongle to the Linux host via a USB-A to USB-B cable.
2. Use the following commands to check the information of the cellular dongle, such as the VID and PID, the network adapter, and the device name of the serial AT port.

```
# lsusb                          // Retrieve the VID:PID of the cellular dongle
Bus 002 Device 002: ID 1bc7:2300   // Example VID:PID = 1bc7:2300
# ifconfig -a                    // Display all network interfaces
usb0 Link encap:Ethernet         // Example RNDIS interface name = 'usb0'
# ls /dev/ttyACM*                // List CDC-ACM serial AT port exposed by the dongle
/dev/ttyACM0                     // Example serial AT port node = /dev/ttyACM0
```

To sum up, the device names of the serial AT port and the RNDIS network adapter enumerated over the USB port are as follows.

Device Name	Device Type	Kernel Driver
usbx (or ethx)	RNDIS network adapter (compliant with RNDIS protocol)	rndis_host
/dev/ttyACMx	Serial AT port (compliant with CDC-ACM specification)	cdc_acm

2.4.3 Establishing Network Connection on Linux Hosts

When using the cellular dongle for the **first time**, you can set up the network connection using either of the following modes.

Setup Mode	Description
Manual AT setup + RNDIS adapter setup	Requires manual re-configuration or re-execution of AT commands after each reboot.
Automatic AT setup + RNDIS adapter setup	Configured once and persists across reboots, unless a factory reset is performed.

2.4.3.1 Manual AT Setup for RNDIS Connection

The following procedure must be repeated after each reboot of the cellular dongle.

1. Connect the cellular dongle to the host device via the USB port.
2. Identify the serial AT port device name as described in Section 2.2.2.2 (assume the device name is /dev/ttyACM0).
3. Open the serial AT port with a terminal program.

```
$ sudo microcom -s 115200 -p /dev/ttyACM0      // /dev/ttyACM0 is the device name
```

4. Use the following AT commands to configure and activate the RNDIS connection:

☆ Deactivate any existing RNDIS connection before initialization

AT^NDISACT=0

☆ Confirm if the SIM card is ready

AT+CPIN?

Expected response: READY. If "ERROR" is returned, please check the SIM card.

☆ Configure the parameters of the cellular dongle

AT^NDISCFG=<cid>[,<pdp_type>[,<apn>[,<dial_number>[,<username>,<password>]]]]

Example for AT&T SIM cards:

AT^NDISCFG=1,IP,m2m.com.att,*99***1#

Example for T-Mobile SIM cards:

AT^NDISCFG=1,IPV4V6,fast.t-mobile,*99***1#

Example for Verizon SIM cards:

AT^NDISCFG=3,IPV4V6,vzwinternet,*99***3#

For Verizon Non-IMS cards (VoLTE not supported), you need add:
AT+CGDCONT=1,"IPV4V6",""

☆ Activate the RNDIS network connection

AT^NDISACT=1

☆ Query the registration status of the SIM card

AT+CREG?

AT+CEREG?

AT+CGREG?

A response of either "X,1" or "X,5" to any of the above commands indicates successful registration. Otherwise, the SIM card is not registered with the operator's network. If needed, query again after waiting up to 300 seconds, or check the cid, pdp_type and apn or the antenna connection, and try again.

☆ Query the signal strength

AT+CSQ

The value should be greater than 9, otherwise you shall check the antenna connection.

☆ Query the network operator

AT+COPS?

☆ Query the status of the cellular data connection status

AT^NDISSTATQRY?

If the response is 0, wait a moment and try again.

☆ Retrieve the public IP address

AT#GETPUBLICIP

Retrieve the public IP address

5. After all commands are executed, press "CTRL" + "X" to exit the microcom session.

The texts in different colors in above command table are distinguished as follows:

- indicates the main function of an AT command.
- represents a specific AT command.
- indicates detailed description of an AT command.

All settings will be stored in the system's NVM. However, the RNDIS connection itself must be re-activated after each reboot unless automatic setup is configured.

2.4.3.2 Automatic AT Setup for RNDIS Connection

Once configured, the automatic setup persists across reboots unless the cellular dongle is factory reset. The procedure is the same as the manual setup in Section 2.3.1, except for the last step, where AT^AUTODIAL=1 is used to enable automatic reconnection.

1. Connect the cellular dongle to the host device via the USB port.
2. Identify the serial AT port device name as described in 2.2.2.2 (assume the device name is /dev/ttyACM0);
3. Open the serial AT port with a terminal program.
   - On Linux: $ sudo microcom -s 115200 -p /dev/ttyACM0
   - On Windows: PuTTY or MobaXterm with 115200 8N1
4. Use the following AT commands for communication;

☆ Deactivate any existing RNDIS connection before initialization

AT^NDISACT=0

☆ Confirm if the SIM card is ready

AT+CPIN?

Expected response: READY. If “ERROR” is returned, please check the SIM card.

☆ Configure the modem firmware for Verizon SIM cards if needed

AT#FWSWITCH=1

☆ Configure the modem firmware for non-Verizon SIM cards if needed

AT#FWSWITCH=0

Wait about 5 seconds for the LTE modem to reboot

☆ Configure the parameters of the cellular dongle

AT^NDISCFG=<cid>[,<pdp_type>[,<apn>[,<dial_number>[,<username>,<password>]]]]

Example for AT&T SIM cards:

AT^NDISCFG=1,IP,m2m.com.att,*99***1#

Example for T-Mobile SIM cards:

AT^NDISCFG=1,IPV4V6,fast.t-mobile,*99***1#

Example for Verizon SIM cards:

AT^NDISCFG=3,IPV4V6,vzwinternet,*99***3#

For Verizon Non-IMS cards (VoLTE not supported), you need add: AT+CGDCONT=1,"IPV4V6",""

☆ Activate the RNDIS network connection

AT^NDISACT=1

☆ Activate automatic RNDIS network connection

AT^AUTODIAL=1

5. After all commands are executed, press "CTRL" + "X" to exit the microcom session.

The texts in different colors in above command table are distinguished as follows:

- indicates the main function of an AT command.
- represents a specific AT command.
- indicates detailed description of an AT command.

All settings will be stored in the system's NVM.

2.4.3.3 RNDIS Adapter Setup

Whether you choose manual AT setup or automatic AT setup in the former section, the RNDIS adapter must be configured. Choose either option below to retrieve the interface information and configure the adapter.

- **Option 1: Set up RNDIS network adapter automatically**

```
# ifconfig -a                          // Display all network interfaces
usb0 Link encap:Ethernet          // Example RNDIS interface name = 'usb0'
# ifconfig usb0 up                  // Activate the RNDIS network adapter
# udhcpc -i usb0                  //Request an IP address for the adapter from DHCP server
udhcpc (v1.21.1) started
Setting IP address 0.0.0.0 on usb0
Sending select for 192.168.253.100...
Lease of 192.168.253.100 obtained, lease time 86400
Setting IP address 192.168.253.100 on usb0      // 192.168.253.100 is assigned to the host
Deleting routers
route: ioctl 0x890c failed: No such process
Adding router 192.168.253.1                // 192.168.253.1 is the IP of the cellular dongle
Recreating /etc/resolv.conf
Adding DNS server 192.168.253.1
```

- **Option 2: Set up RNDIS network adapter manually**

```
# ifconfig usb0 192.168.253.100 netmask 255.255.255.0 up

// to set an IP address and subnet mask for the RNDIS network adapter and bring the
   interface up

# route del default                          // to delete the default route

# route add default gw 192.168.253.1        // to add a new default route with the gateway
                                               set to 192.168.253.1

# echo "nameserver 192.168.253.1" >> /etc/resolv.conf

// to append the line nameserver 192.168.253.1 to the /etc/resolv.conf file

# sync                                       // to sync the settings
```

2.4.3.4 Accessing the RNDIS Network

Once the RNDIS network adapter is set up, input the following command to check if the network connection has established properly.

```
$ ping www.baidu.com

PING www.baidu.com (61.135.169.125): 56 data bytes

64 bytes from 61.135.169.125: seq=0 ttl=53 time=675.660 ms

64 bytes from 61.135.169.125: seq=1 ttl=53 time=505.146 ms

64 bytes from 61.135.169.125: seq=2 ttl=53 time=575.010 ms

64 bytes from 61.135.169.125: seq=3 ttl=53 time=464.935 ms

64 bytes from 61.135.169.125: seq=4 ttl=53 time=414.991 ms


--- www.baidu.com ping statistics ---

5 packets transmitted, 5 packets received, 0% packet loss

round-trip min/avg/max = 414.991/527.148/675.660 ms
```

2.4.3.5 Disconnecting the RNDIS Connection

AT commands used to disconnect an RNDIS network are **"AT^NDISDUP=<cid>,0"** or **"AT^NDISACT=0"** and **"AT^NDISSTATQRY?"**.

Open the serial AT port with a serial program (e.g., microcom) on a Linux host and follow the steps below to disconnect the network.

```
$ sudo microcom -s 115200 -p /dev/ttyACM0

☆ Enable the local echo
ATE1
OK

☆ Deactivate the RNDIS network connection
AT^NDISDUP=0 ——> AT^NDISDUP=<act>. If <act> is set to 0, the network connection of the cellular dongle will be terminated
OK
OR
AT^NDISACT=0 ——> When <act> = 0, the network connection would be deactivated even it is up.
OK

☆ Query the status of the cellular data connection
AT^NDISSTATQRY?
^NDISSTATQRY: 0 ——> The network is disconnected

OK
```

For Windows hosts, use a terminal emulator such as PUTTY or MobaXterm.

After all commands are sent, press "CTRL" and "X" keys to terminate the microcom session and exit.

The texts in different colors in above table are distinguished as follows:

- indicates the main function of an AT command.
- represents a specific AT command.
- indicates the response of an AT command.
- are detailed description of an AT command response.

Please note that:

1. The operation takes effect immediately.
2. After the deactivation, the cellular dongle will not establish a network connection anymore until you perform **either** of the following operations:

   - **Option 1:**

     Send an AT command to enable the network:

     "AT^NDISACT=1" **or**

     "AT^NDISDUP=<cid>,1[,<APN>[,<username>,<password>]]"

   - **Option 2:**

     Enable **Automatic RNDIS Dial-up** (AT^AUTODIAL=1) and reboot the cellular dongle.

Refer to **Chapter 3** for general/network-related AT commands.

CHAPTER 3 AT COMMANDS

3.1 General AT Commands

AT Command	Description
Device-level Commands	
AT#VERSION	Query software version
AT#GETMM	Query the module used by the cellular dongle
AT#MREBOOT	Reboot the cellular dongle
AT#REDEFAULT	Restore to factory NVM settings
AT#MSYSNVM	Manage NVM settings commit
AT#MSYSLOG	Enable/Disable saving the syslog to flash
RNDIS Network Connection Commands	
AT^SETDIALNUM	Set the dial number (Could be replaced by AT^NDISCFG)
AT^SETPDPTYPE	Set the PDP type (Could be replaced by AT^NDISCFG)
AT^NDISDUP	Manage the RNDIS network connection (Could be replaced by AT^NDISCFG and AT^NDISACT)
AT^NDISSTATQRY	Query the RNDIS network connection Status
AT^NDISCFG	Set all settings for RNDIS network connection
AT^NDISACT	Activate/Deactivate RNDIS network connection
AT^AUTODIAL	Automatic RNDIS network connection
AT#GETPUBLICIP	Query public IP
AT#HTBTPING	Send ping request
AT#MMTUMRU	Manage MTU/MRU of RNDIS network connection

3.2 Device-level Commands

- **Query the Software Version - AT#VERSION**

Query Software Version	
AT#VERSION	**Description:** Query the software version of the cellular dongle. **Response(s):** <CR><LF> <**Version**><**Build Data**><CR><LF> <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
AT#VERSION?	**Description:** Query the software version of the cellular dongle when pre-certified. **Response(s):** <CR><LF> <**Version**> <**Build Data**><CR><LF> <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	**Input:** AT#VERSION? **Output:** VT-XOS_1.9 10/29/18 **Output:** OK

- **Query the Module in the Cellular Dongle - AT#GETMM**

Query Cellular Dongle Identity	
AT#GETMM	**Description:** Query the name of the cellular dongle. **Response(s):** <CR><LF> <**Module Name**><CR><LF> <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF> **Parameter(s):** <**Module Name**>-The name of the cellular dongle.
Example	**Input:** AT#GETMM **Output:** VT-MOB-LTE4Q-PB **Output:** OK

- **Reboot the Cellular Dongle - AT#MREBOOT**

Reboot the Cellular Dongle	
AT#MREBOOT	**Description:** Reboot the cellular dongle. **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	**Input:** AT#MREBOOT **Output:** OK
Note	The cellular dongle will reboot automatically right after responding to this AT command.

- **Restore to Factory NVM Settings - AT#REDEFAULT**

Restore to Factory NVM Settings	
AT#REDEFAULT	**Description:** Factory reset the cellular dongle. **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	**Input:** AT#REDEFAULT **Output:** OK
Note	The cellular dongle will reboot automatically right after responding to this AT command.

- **Manage Changes to NVM Settings - AT#MSYSNVM**

Manage Changes to NVM Settings	
AT#MSYSNVM =<en>	**Description:** Confirm whether changes made to NVM settings are saved to the flash. If you enable the **Automatic RNDIS Dial-up** feature for RNDIS network setup, there's no need to set <**en**> to 0. If you have established the network by manually configuring the 'Dial Number'/'PDP Type'/'APN' parameters every time after the cellular dongle is powered up, please set the parameter <**en**> to 0. **Parameter(s):** <**en**> 0 – Do not save changes made to NVM settings 1 – Save the changes made to NVM settings (default) **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	**Input:** AT#MSYSNVM=0 **Output:** OK
AT#MSYSNVM?	Query the current settings **Response:** <CR><LF> #MSYSNVM: <**en**><CR><LF> <CR><LF>OK<CR><LF>
Note	If the host issues the AT commands specified in this document to modify NVM settings, send `AT#MSYSNVM=0` each time the cellular dongle powers up.

- **Save the Syslog to Flash - AT#MSYSLOG**

Save the Syslog to Flash	
AT#MSYSLOG =<en>	**Description:** Confirm whether to save the syslog to the flash. **Parameter(s):** <**en**> 0 – Do not save syslog to the flash (default) 1 – Save syslog to the flash **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	**Input:** AT#MSYSLOG=0 **Output:** OK
AT#MSYSLOG?	Query the current settings. **Response:** <CR><LF> #MSYSLOG: <**en**><CR><LF> <CR><LF>OK<CR><LF>
Note	1. the settings would be applied right after responding to this command. 2.When <en> = 0, the syslog will lose after the cellular dongle reboots.

3.3 Network Setup Commands

- **Set the Dial Number - AT^SETDIALNUM**

Set the Dial Number	
AT^SETDIALNUM =<dial number>	**Description:** Set the Dial Number. **Parameter(s):** <**dial number**> - Specific to GPRS functionality and prompts the MT to perform necessary actions to establish communication between the TE and the external PDN. Dial number parameters: ***<**gprs_sc**>[***<**addr**>][***[<**L2P**>][***[<**cid**>]]]]# <**gprs_sc**> - GPRS service code, represented by a digit string (e.g., 99), identifying a request to utilize GPRS. <**addr**> - A string identifying the called party within the address space applicable to the PDP. <**L2P**> - A string indicating the layer 2 protocol to be employed. For communication software lacking support for arbitrary characters in the dial string, the following numeric equivalents are utilized: 1 for PPP. <**cid**> - A digit specifying a particular PDP context definition (refer to the **+CGDCONT** command). **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
AT^SETDIALNUM?	Query the current settings
Example	**Input:** AT^SETDIALNUM=*99***1# **Output:** OK
Note	1. The settings would apply when the RNDIS network connection is established. 2. Use of this AT command is not suggested. You can use **AT^NDISCFG** as a replacement.

- **Set the PDP Type - AT^SETPDPTYPE**

Set the PDP Type	
AT^SETPDPTYPE **=<PDP_type>**	**Description:** Set the PDP type for a dial number. **Parameter(s):** <**PDP_type**> A string parameter which specifies the type of the packet data protocol. **IP** Internet Protocol (IETF STD 5) **IPV4V6** Dual PDN Stack **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
AT^SETPDPTYPE?	Query the current settings **Response:** <CR><LF> ^SETPDPTYPE: **<PDP_type>**<CR><LF> <CR><LF>OK<CR><LF>
Example	**Input:** AT^SETPDPTYPE=IPV4V6 **Output:** OK
Note	1. The settings are stored to the system's NVM by default. 2. The settings would be applied right after responding to this command. 3. Use of this AT command is not suggested. You can use **AT^NDISCFG** as a replacement.

- **Set up RNDIS Dial-up Connection - AT^NDISDUP**

Set RNDIS-Based Dial-up	
AT^NDISDUP **=<cid>** **,<act>** **[,<APN>** **[,<username>** **[,<password>]]]**	**Description:** Set RNDIS-based dial-up connection. **Parameter(s):** <**cid**> - A digit specifying a particular PDP context definition (refer to the **AT+CGDCONT** command). <**act**>: 0 - Deactivate the RNDIS network connection 1 - Activate the RNDIS network connection <**APN**> - A string parameter serving as a logical name used to select the Gateway GPRS Support Node (GGSN) or the external packet data network. If the value is empty (“”) or omitted, the subscription value will be requested. <**username**> - user name represented by a character string (0 to 128 bytes) <**password**> - password represented by a character string (0 to 128 bytes) **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
AT^NDISDUP?	Query the current settings **Response:** <CR><LF> ^NDISDUP:<**cid**>,<**act**>,<**APN**>[,<**username**>,<**password**>] <CR><LF><CR><LF>OK<CR><LF>
Example	Activate the connection: **Input:** AT^NDISDUP=1,1,3gnet,card,card **Output:** OK Deactivate the connection:

	Input: AT^NDISDUP=1,0 **Output:** OK
Note	1. This operation takes effect immediately to activate/ deactivate a network connection. 2. The settings are stored to the system's NVM by default. 3. If the **Automatic RNDIS Dial-up** feature is not enabled, the <act> parameter would be 0 after the cellular dongle reboots. Therefore, if auto dial-up is not enabled again, users must manually activate the network connection every time when the cellular dongle reboots by typing the command: "AT^NDISDUP=<cid>,1[,<APN>[,<username>[,<password>]]]" to activate network connection. 4. The cellular dongle will not try to establish a network connection anymore after receiving AT command "AT^NDISDUP=<cid>,0" until **either** of the following operations is performed: • Sending the AT command: "AT^NDISACT=1" **or** "AT^NDISDUP=<cid>,1[,<APN>[,<username>,<password>]]" • Enabling the **Automatic RNDIS Dial-up** feature and reboot the cellular dongle 5. Use of this AT command is not suggested. You can use **AT^NDISCFG** or **AT^NDISACT** as a replacement.

- **Query the RNDIS Connection Status - AT^NDISSTATQRY**

Query the RNDIS Connection Status	
AT^NDISSTATQRY?	**Description:** Query the connection status of the RNDIS-based dial-up. **Response(s):** <CR><LF> ^NDISSTATQRY: **<status>**<CR><LF> <CR><LF>OK<CR><LF> <**status**> 0 - The network connection is deactivated. 1 - The network connection is active. In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	When the connection is deactivated: **Input:** AT^NDISSTATQRY? **Output:** ^NDISSTATQRY: 0 **Output:** OK When the connection is activated: **Input:** AT^NDISSTATQRY? **Output:** ^NDISSTATQRY: 1 **Output:** OK

- **Manual Setup for RNDIS Network Connection - AT^NDISCFG**

Set All Parameters for RNDIS Network Connection	
AT^NDISCFG **=<cid>** **[,<pdp_type>** **[,<apn>** **[,<dial_number>** **[,<username>,<password>]]]]**	**Description:** Set all Parameters for RNDIS network connection **Parameter(s):** <**cid**> - A digit specifying a particular PDP context definition (refer to the **AT+CGDCONT** command). <**pdp_type**> A string parameter which specifies the type of the packet data protocol. **IP** - Internet Protocol (IETF STD 5) (Default) **IPV4V6** - Dual PDN stack <**apn**> - A string parameter serving as a logical name used to select the Gateway GPRS Support Node (GGSN) or the external packet data network. If the value is empty (“”) or omitted, the subscription value will be requested. <**dial_number**> - Specific to GPRS functionality and prompts the MT to perform necessary actions to establish communication between the TE and the external PDN. ***<gprs_sc>[*<addr>][*[<L2P>][*[<cid>]]]]#, for example:** ***99#** <**username**> - user name represented by a character string (0 to 128 bytes) <**password**> - password represented by a character string (0 to 128 bytes) **Response(s):** <CR><LF>OK<CR><LF>

	In case of an MT-related error: <CR><LF>ERROR<CR><LF>
AT^NDISCFG?	Query the current settings of the network. **Response:** <CR><LF> ^NDISCFG: <**cid**>,<**pdp_type**>,<**apn**>,<**dial_number**>, <**username**>,<**password**><CR><LF> <CR><LF>OK<CR><LF>
Example	**Input:** AT^NDISCFG=3,IPV4V6 **Output:** OK
Note	1. The settings are stored to the system's NVM by default. 2. The settings would be applied right after responding to this command.

- **Activate/Deactivate RNDIS Network Connection - AT^NDISACT**

Activate/Deactivate the RNDIS Network Connection	
AT^NDISACT =<act>	**Description:** Activate or deactivate the RNDIS network connection. **Parameter(s):** <**act**> 0 – Deactivate the RNDIS network connection 1 – Activate the RNDIS network connection **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	**Input:** AT^NDISACT =0 **Output:** OK
AT^NDISACT?	Query the current activation status of the RNDIS network. **Response:** <CR><LF> ^NDISACT: <**act**><CR><LF> <CR><LF>OK<CR><LF>
Note	1.Settings would be applied right after responding to this command. 2.When <act> = 0, RNDIS network would be deactivated even it is up. 3.The <act> will be 0 after the cellular dongle reboots when the automatic dial-up is disabled. Therefore, if auto dial-up is not enabled again, users must manually activate the network connection every time when the cellular dongle reboots using the command: “AT^NDISACT=1“.

- **Automatic RNDIS Dial-up After Reboot - AT^AUTODIAL**

Automatic RNDIS Dial-up After Reboot	
AT^AUTODIAL =<en>	**Description:** Set the **Automatic RNDIS Dial-up** feature to be enabled or not for network connection after the cellular dongle reboots. **Parameter(s):** <e**n**>: 0 - Disable the automatic dial-up (default) 1 - Enable the automatic dial-up **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
AT^AUTODIAL?	Query the current settings of automatic dial-up. **Response(s):** <CR><LF> ^AUTODIAL: **<en>**<CR><LF> <CR><LF>OK<CR><LF>
Example	Enable the automatic dial-up: **Input:** AT^AUTODIAL=1 **Output:** OK Disable the automatic dial-up: **Input:** AT^AUTODIAL=0 **Output:** OK
Note	1. This command takes effect after the cellular dongle reboots; 2. The settings are stored to the system's NVM by default. 3. Firstly, please setup network connection with the correct **PDPCID**, **APN**, **Username**, **Password** with AT^NDISDUP, then confirm if the cellular dongle has a network connection with AT^NDISSTATQRY?. After this, these parameters will be stored in the cellular dongle. Next time the cellular dongle will set up network connection automatically after reboot when it receives command **AT^AUTODIAL=1**.

- **Query Public IP - AT#GETPUBLICIP**

Query Public IP	
AT#GETPUBLICIP	**Description:** Query the public IP address of the cellular dongle. **Response(s):** <CR><LF> #GETPUBLICIP:<**Public IP address**><CR><LF> <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	When the connection is deactivated: **Input:** AT#GETPUBLICIP **Output:** #GETPUBLICIP:0.0.0.0 **Output:** OK When the connection is activated: **Input:** AT#GETPUBLICIP **Output:** #GETPUBLICIP:xxx.yyy.zzz.www **Output:** OK

- **Set Link Heartbeat Check Service - AT#HTBT**

Set Link Heartbeat Check Service	
AT#HTBT =<en>[,<single ping timeout>[,<ping interval>]]	**Description:** Set link heartbeat check service **Parameter(s):** <**en**>: 0 - Disable the link heartbeat check service 1 - Enable the link heartbeat check service (default) <**single ping timeout**> - the timeout of every single Ping is 1000-65535ms (default **6000**) <**ping interval**> - the interval between two ping tests is 10-65535s <default **60**> **Response(s)**: <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
AT#HTBT?	Query the current settings for link check. **Response(s)**: <CR><LF> #HTBT: <**en**>,<**single ping timeout**>,<**ping interval**><CR><LF> <CR><LF>OK<CR><LF>
Example	**Input:** AT#HTBT=1,6000 **Output:** OK
Note	1. We recommend you keep the link heartbeat check service enabled all the time to check the network connection and keep it online. 2. The settings are stored to the system's NVM by default.

- **Set the IP Addresses for Link Heartbeat Check Service - AT#HTBTADD**

Set the IP Addresses for Link Heartbeat Check Service	
AT#HTBTADD **=<IP address1> [,<IP** **address2>** **[,<IP address3>** **[,<IP address4>** **[,<IP address5>]]]]**	**Description:** Set the IP addresses for link heartbeat check service. **Parameter(s):** <**IP address[1-10]**>- address of the remote host, string type. This parameter can be any valid IP address in the format: "xxx.xxx.xxx.xxx" (Link heartbeat check service needs multiple IP addresses by default: **8.8.8.8,223.5.5.5,1.0.0.1,114.114.114.114**) **Response(s):** <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
AT#HTBTADD?	Query the current settings of the IP addresses for link check.
Example	**Input:** AT#HTBTADD=8.8.8.8,1.0.0.1,114.114.114.114 **Output:** OK
Note	1. Please set a reachable IP address for the link heartbeat check, otherwise the cellular dongle might end up with a bad state. 2. The settings are stored to the system's NVM by default.

- **Send Ping Request - AT#HTBTPING**

Send Ping Request	
AT#HTBTPING **=<IP address>** **[,<retryNum>]** **[,<Timeout>]**	**Description:** Send a Ping request. **Parameter(s):** <**IP address**>- address of the remote host, string type. This parameter can be any valid IP address in the format: "xxx.xxx.xxx.xxx" <**retryNum**> - the number of Ping request to send 1-64 (default: **3**) <**Timeout**> - the timeout of every single Ping test 1-65535ms (default: **1000**) **Response(s)**: <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF>
Example	**Input:** AT#HTBTPING=8.8.8.8 **Output:** OK

- **Manage MTU/MRU - AT#MMTUMRU**

Manage MTU/MRU	
AT#MMTUMRU =<en>,<mtu>	**Description:** Manage the link heartbeat check service **Parameter(s):** <**en**>: 0 - Disable the MTU/MRU settings (Default) 1 - Enable the MTU/MRU settings <**mtu**> - the Maximum Transmit Unit (MTU) and the Maximum Receive Unit (MRU) of RNDIS connection 1280 -1500 (Default: 1500) **Response(s)**: <CR><LF>OK<CR><LF> In case of an MT-related error: <CR><LF>ERROR<CR><LF> Note: Only when <**en**> is to 1, the **mtu** value would be applied.
AT#MMTUMRU?	Query the current setting of MTU/MRU **Response(s)**: <CR><LF> #MMTUMRU: <**en**>,<**mtu**>,<**mru**><CR><LF> <CR><LF>OK<CR><LF>
Example	**Input:** AT#MMTUMRU=1,1500 **Output:** OK

CHAPTER 4 DISPOSAL AND WARRANTY

4.1 Disposal

When the device comes to end of life, you are suggested to properly dispose of the device for the sake of the environment and safety.

Before you dispose of the device, please back up your data and erase it from the device.

It is recommended that the device is disassembled prior to disposal in conformity with local regulations. Please ensure that the abandoned batteries are disposed of according to local regulations on waste disposal. Do not throw batteries into fire or put in common waste canister as they are explosive. Products or product packages labeled with the sign of “explosive” should not be disposed of like household waste but delivered to specialized electrical & electronic waste recycling/disposal center.

Proper disposal of this sort of waste helps avoid harm and adverse effect upon surroundings and people’s health. Please contact local organizations or recycling/disposal center for more recycling/disposal methods of related products.

4.2 Warranty

Product Warranty

VANTRON warrants to its CUSTOMER that the Product manufactured by VANTRON, or its subcontractors will conform strictly to the mutually agreed specifications and be free from defects in workmanship and materials (except that which is furnished by the CUSTOMER) upon shipment from VANTRON. VANTRON's obligation under this warranty is limited to replacing or repairing at its option of the Product which shall, within **24 months** after shipment, effective from invoice date, be returned to VANTRON's factory with transportation fee paid by the CUSTOMER and which shall, after examination, be disclosed to VANTRON's reasonable satisfaction to be thus defective. VANTRON shall bear the transportation fee for the shipment of the Product to the CUSTOMER.

Out-of-Warranty Repair

VANTRON will furnish the repair services for the Product which are out-of-warranty at VANTRON's then-prevailing rates for such services. At customer's request, VANTRON will provide components to the CUSTOMER for non-warranty repair. VANTRON will provide this service as long as the components are available in the market; and the CUSTOMER is requested to place a purchase order up front. Parts repaired will have an extended warranty of 3 months.

Returned Products

Any Product found to be defective and covered under warranty pursuant to Clause above, shall be returned to VANTRON only upon the CUSTOMER's receipt of and with reference to a VANTRON supplied Returned Materials Authorization (RMA) number. VANTRON shall supply an RMA, when required within three (3) working days of request by the CUSTOMER. VANTRON shall submit a new invoice to the CUSTOMER upon shipping of the returned products to the CUSTOMER. Prior to the return of any products by the CUSTOMER due to rejection or warranty defect, the CUSTOMER shall afford VANTRON the opportunity to inspect such products at the CUSTOMER's location and no Product so inspected shall be returned to VANTRON unless the cause for the rejection or defect is determined to be the responsibility of VANTRON. VANTRON shall in turn provide the CUSTOMER turnaround shipment on defective Product within **fourteen (14) working days** upon its receipt at VANTRON. If such turnaround cannot be provided by VANTRON due to causes beyond the control of VANTRON, VANTRON shall document such instances and notify the CUSTOMER immediately.

Appendix Regulatory Compliance Statement

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of 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.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate this equipment.

RF Radiation Exposure Statement:

1. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body.
2. The device has been evaluated to meet general RF exposure requirement.