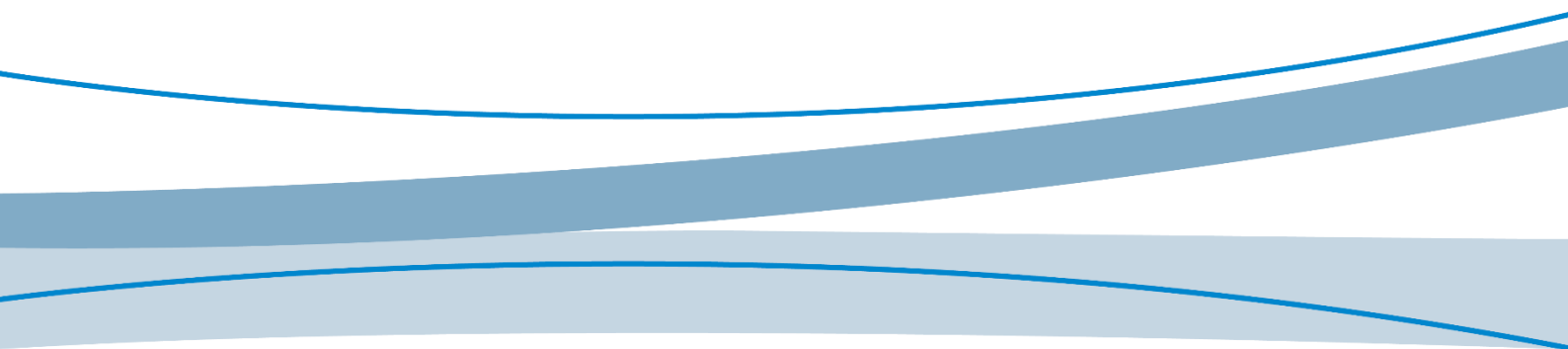




FG132

Quick Start Guide

V1.0



Disclaimer

Customers must design and develop their products referring to the information provided in the document. The Company shall not be liable for any damage caused by failure to comply with relevant operation or specifications or rules. Due to product version upgrade or other reasons, the Company reserves the right to modify any information in this document at any time without prior notice and any responsibility. Unless otherwise agreed, all statements, information and suggestions in this document do not constitute any express or implied guarantee.

Copyright Notice

Copyright © 2024 Fibocom Wireless Inc. All rights reserved.

Unless specially authorized by the Company, the recipient of the documents shall keep the documents and information received confidential, and shall not use them for any purpose other than the implementation and development of this project. Without the written permission of the Company, no unit or individual shall extract or copy part or all of the contents of this document without authorization, or transmit them in any form. The Company has the right to investigate legal liabilities for any offense and tort in connection with violation of confidentiality obligations, or unauthorized use or malicious use of the said documents and information in other illegal forms.

Trademark Statement

 The trademark is registered and owned by Fibocom Wireless Inc.

Other trademarks, product names, service names and company names appearing in this document are owned by their respective owners.

Contact Information

Website: <https://www.fibocom.com>

Address: 10/F-14/F, Block A, Building 6, Shenzhen International Innovation Valley, Dashi First Road, Xili Community, Xili Subdistrict, Nanshan District, Shenzhen

Tel: 0755-26733555

Safety Instructions

Do not operate wireless communication products in areas where the use of radio is not recommended without proper equipment certification. These areas include environments that may generate radio interference, such as flammable and explosive environments, medical devices, aircraft or any other equipment that may be subject to any form of radio interference.

The driver of any vehicle shall not operate wireless communication products while controlling the vehicle, otherwise will be reduced the driver's control of the vehicle, resulting in safety risks.

Wireless communication devices do not guarantee effective connection under any circumstances, such as when the (U) SIM card is invalid or the device is in arrears. In an emergency, please use the emergency call function when the device is turned on, and ensure that the device is located in an area with sufficient signal strength.

Contents

1 Overview	3
2 Booting the Module	4
2.1 Powering on and Booting	4
2.1.1 DC Power Supply and Jumper Selection	4
2.1.2 USB 2.0 Power Supply and Jumper Selection	5
2.1.3 Instructions for Using the USB Port.....	6
2.1.4 Instructions for Using the UART Port	7
2.2 Driver Installation.....	7
3 Sending AT Commands.....	8
4 Setting and Querying Network	9
4.1 Querying SIM Status.....	9
4.2 Querying Network Registration Status	9
4.3 Setting Network System.....	11
5 Collection Methods of Common Logs	12
5.1 Introduction to QXDM Log Capture	12
5.2 Introduction to Serial Port Log	14
6 Data Dialing (RMNET)	16
6.1 Dialing Principle.....	16
6.2 Quick Dialing	16
6.2.1 Setting USB Mode.....	16
6.2.2 Checking the NIC Driver.....	16
6.2.3 Connecting the Network.....	17

Change History

V1.0 (2023-11-29)	Initial version.
-------------------	------------------

1 Overview

.....
This document is a quick guide to the FG132 module.

- Hardware: This document takes the FG132 module as an example, and introduces the selection of jumpers for DC power supply, USB power supply, USB interface and UART interface.
- Software: It mainly introduces how to get log and how to dial.

2 Booting the Module

2.1 Powering on and Booting

Power on the module through the power supply and press the on/off button for booting.

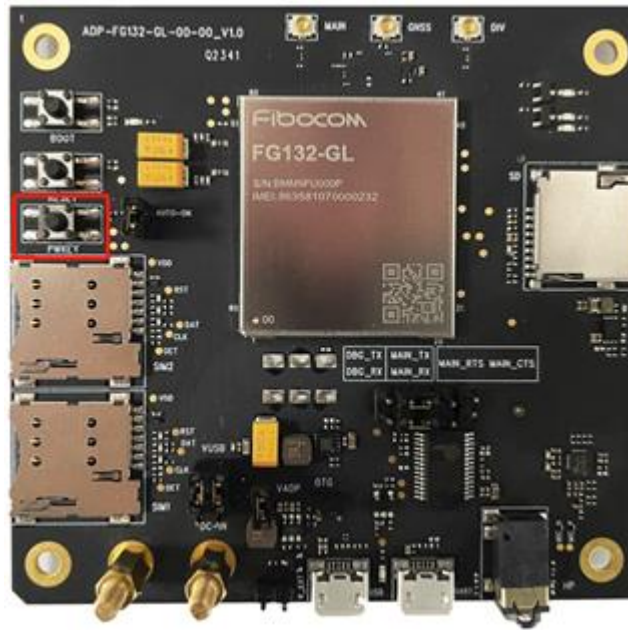


Figure 1. On/Off button



To change the power supply mode when the module is connected to the power supply, both jumper caps need to be removed at the same time to make the change.

It is strictly forbidden to insert two jumper caps into the development board according to different power supply modes, which will cause short circuit of the module.

2.1.1 DC Power Supply and Jumper Selection

When DC power supply is used, perform the following steps:

1. Configure the jumper.

Configure the power selection jumper as the upper two jumper caps.

2. Connect the positive pole and negative pole of the power supply.

Connect the positive pole to the DC+ terminal and the negative pole to the DC- terminal.



Figure 2. Power supply

2.1.2 USB 2.0 Power Supply and Jumper Selection

When USB power supply is used, ensure that no power is connected to the DC power interface. The steps are as follows:

1. Configure the jumper.

Configure the power selection jumper face the lower two jumper caps shown in Figure 3.

2. Connect the USB cable.

Insert the USB cable into the USB port.

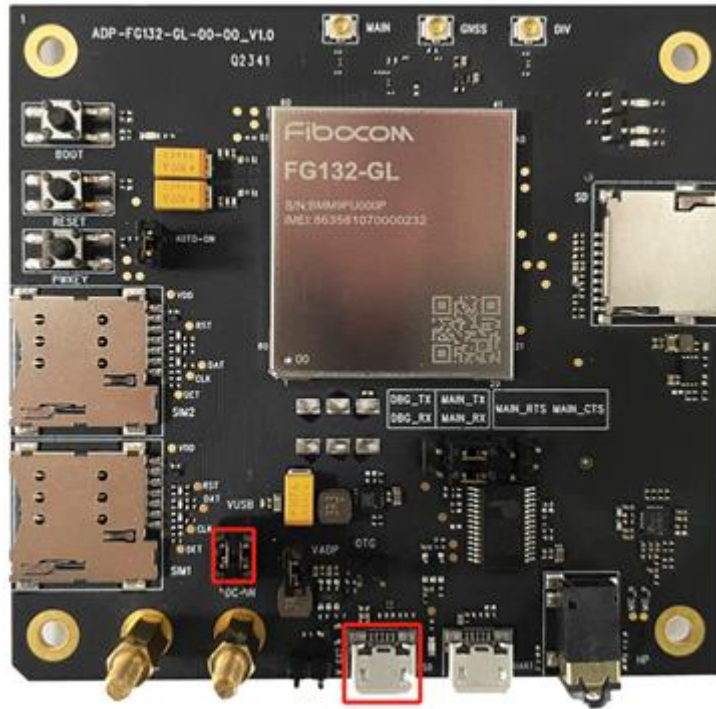


Figure 3. USB power supply

2.1.3 Instructions for Using the USB Port

You can upgrade firmware or send and receive AT commands for the module by connecting to the computer through the USB interface. The USB interface of the development board is connected to the USB interface of the PC, and the USB interface type is Micro USB.

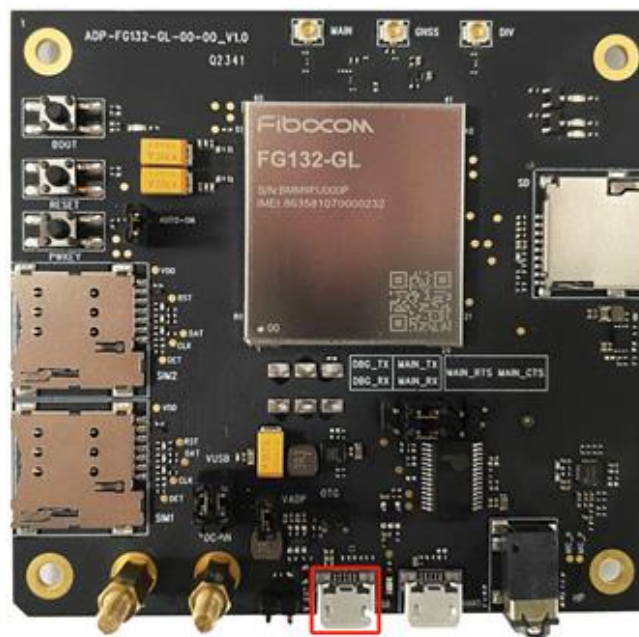


Figure 4. USB communication

2.1.4 Instructions for Using the UART Port

The development board contains a UART to USB interface chip PL2303, which is connected to two UART ports of the module (4-wire main serial port and 2-wire debug serial port). The USB interface type is micro USB. Users can connect the module to the PC using a micro USB cable. The steps are as follows:

1. Configure the jumper.

Select the jumper cap to the left or right to insert the selected serial port.

2. Connect the PC.

Connect the UART of the development board to the USB port of the PC.

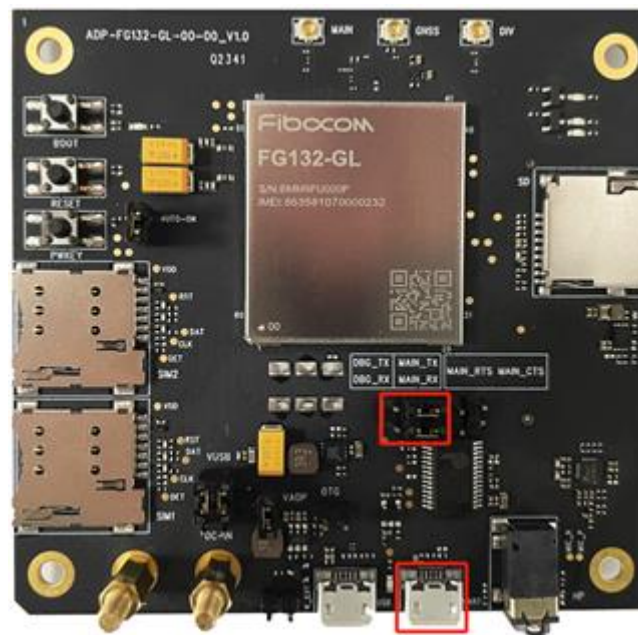


Figure 5. Serial interface communication



Do not use UART port and the UART-to-USB port simultaneously.

2.2 Driver Installation

Contact Fibocom technical support to get the driver (Fibocom_Windows_USB_Drivers), unzip it, double-click the .exe file, and follow the prompts to install it.

3 Sending AT Commands

1. Connect the PC to the module through USB and boot the module (refer to section 2 for booting steps).
2. After normal boot, check the following ports in Device Manager.



Figure 6. USB COM ports

3. Open the serial port tool, select the AT port to open, check the DTR, and you can input and send AT commands.

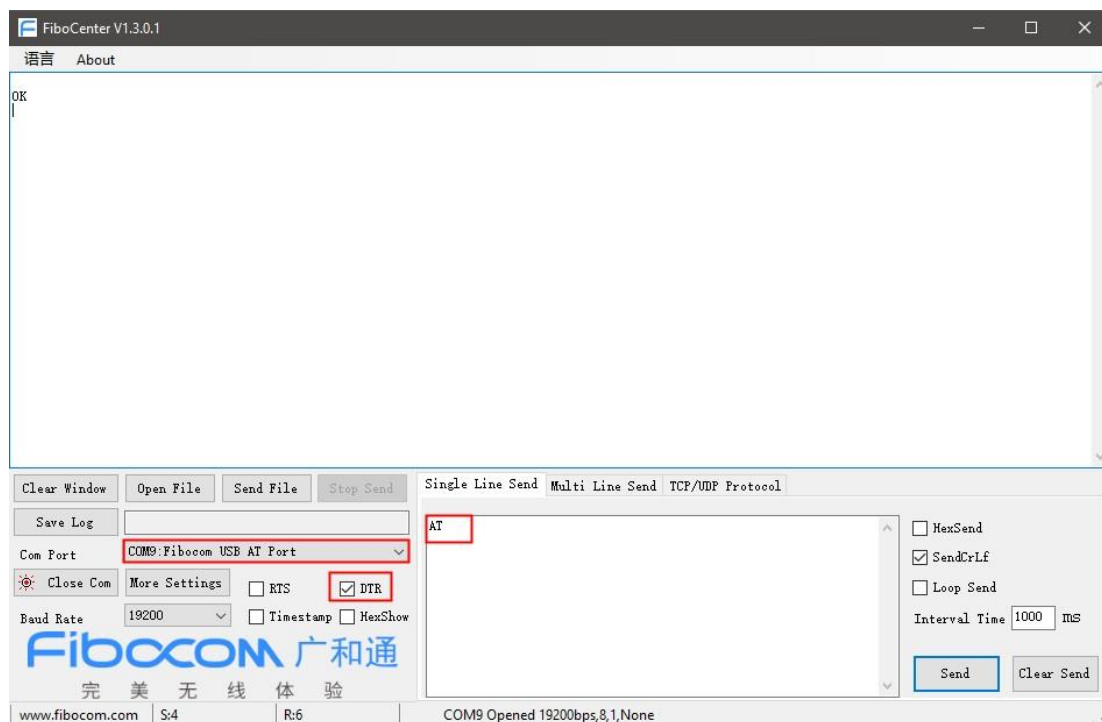


Figure 7. Selecting & opening AT Port

4 Setting and Querying Network

4.1 Querying SIM Status

Run AT+CPIN to query SIM card status. If +CPIN: READY is returned, indicating that the SIM card has been identified normally; If other results are returned, the SIM card is working abnormally.



Figure 8. Querying SIM status

4.2 Querying Network Registration Status

1. Run AT+CFUN to query the module working status.

If +CFUN: 1,0 is returned, indicating that the module works in the normal function mode. If other results are returned, the module cannot register the network normally, and you can try to switch to the normal operation mode through AT+CFUN=1.



Figure 9. Querying module working status

2. Run AT+COPS? to querying network registration status.

AT+COPS? The command returns the current registered network. The third parameter of COPS identifies the current registered network name (as shown in the following figure, it can also show the PLMN ID of the registered network if you set AT+COPS=3,2) and the fourth parameter identifies the current network system (7 represents LTE, and 11 represents NR).

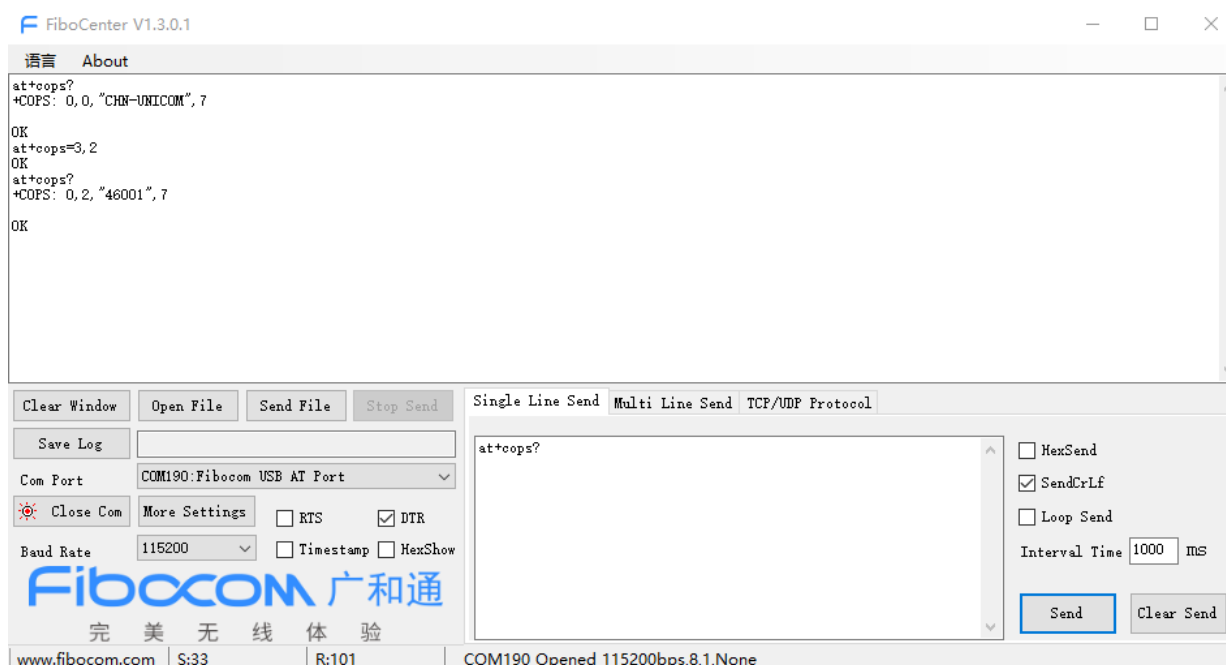


Figure 10. Querying network registration status

4.3 Setting Network System

You can use AT+GTRAT to query and set the the current network system.

AT+GTRAT=? can query all the network systems supported by the module, as shown in the following figure. The module can support LTE (3), AUTO Mode (10), NR ONLY (14) and LTE/NR (17).

The corresponding network system is set by AT+GTRAT=RAT. AT present, the RATs supported by FG132 include LTE (3), AUTO Mode (10), NR ONLY (14) and LTE/NR (17).

You can use AT+GTRAT? to query the current network system.



Figure 11. Setting network mode

5 Collection Methods of Common Logs

5.1 Introduction to QXDM Log Capture

FLogCapTool can effectively track the data sent by mobile phone terminals. Through the analysis of data, it can diagnose signaling flow and analyze data packets. Correct and reasonable use can provide convenient positioning means for test.

You can capture QXDM logs by following the following process.

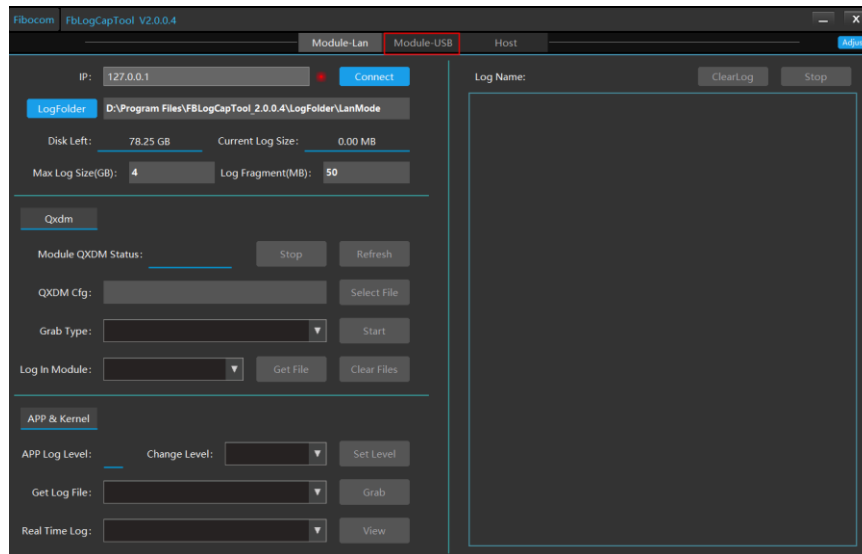


Figure 12. Selecting module-USB

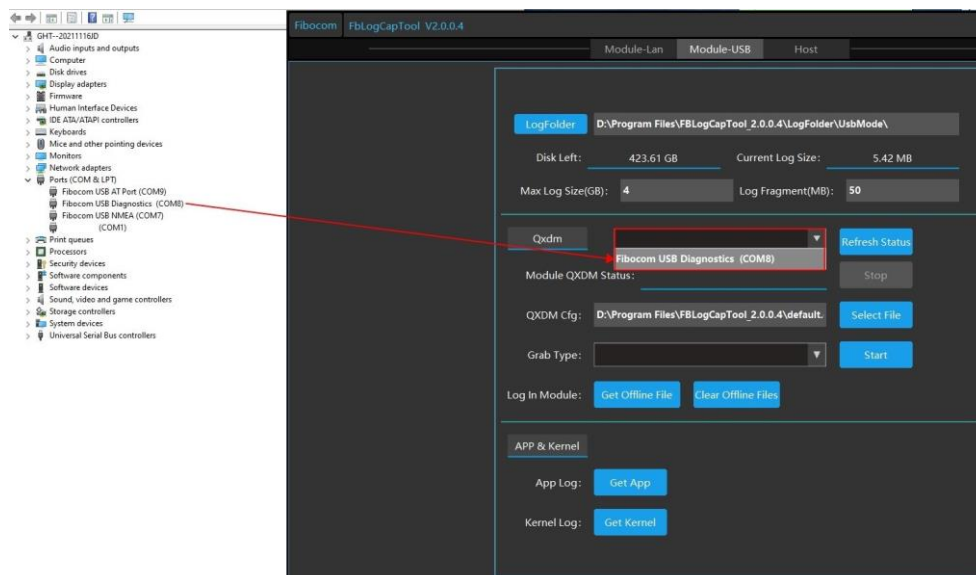


Figure 13. Selecting the Fibocom USB Diagnostics port in the QXDM drop-down box

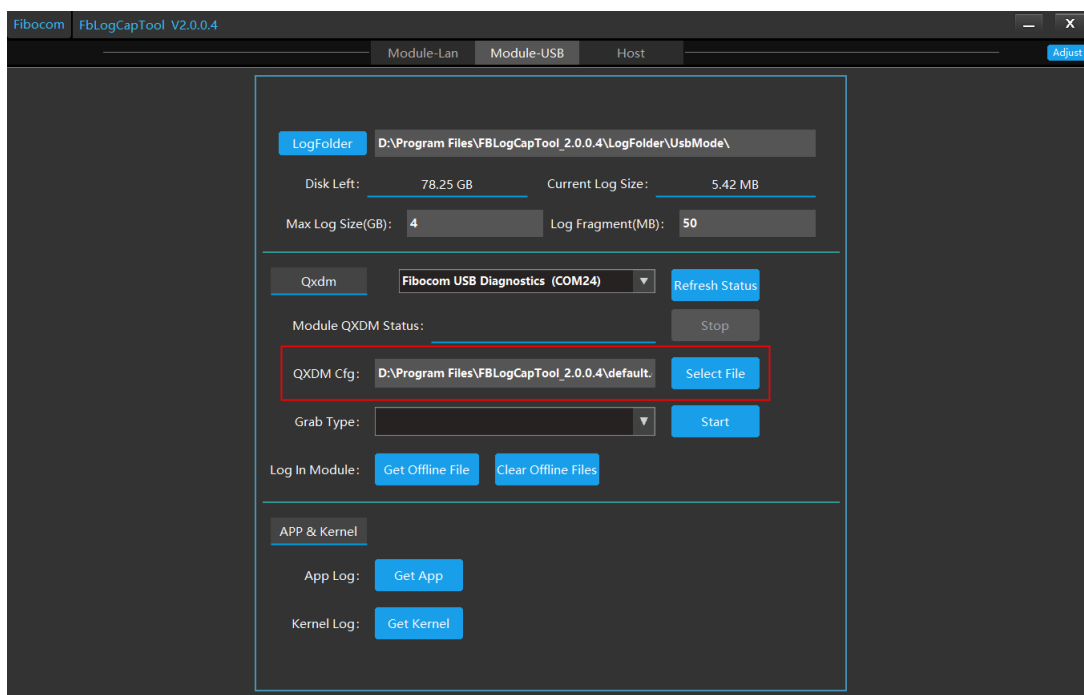


Figure 14. Selecting configuration files



The configuration file of QXDM is cfg. Different problems will have different configurations. Before capturing logs, you need to confirm which configuration to use with Fibocom technical support. If not specifically pointed out, use default.cfg.

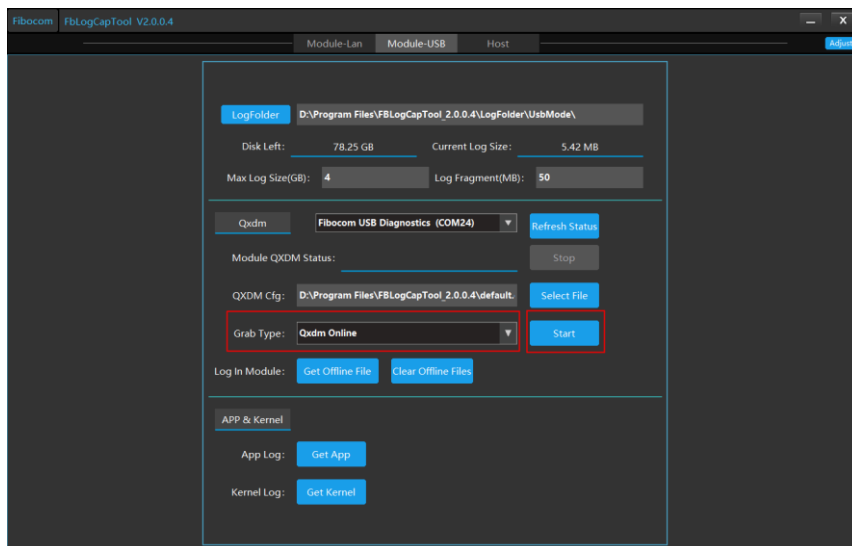


Figure 15. Selecting Qxdm Online for Grab Type and clicking Start to start capturing logs

Logs are saved to the Log Folder, and for detailed instructions on how to use the tool, see *Fibocom_FbLogCapTool User Guide*.

5.2 Introduction to Serial Port Log

Qualcomm SDX35 platform products support viewing logs through serial console. You can set serial baud rate to 115200bps, and connect to ADP debug port to USB or EVK UART jump cap. As shown in the following figure, enter the account and password, enter the serial port console, and view the kernel log through dmesg. Hardware connection and debug serial log are shown in the following figure:

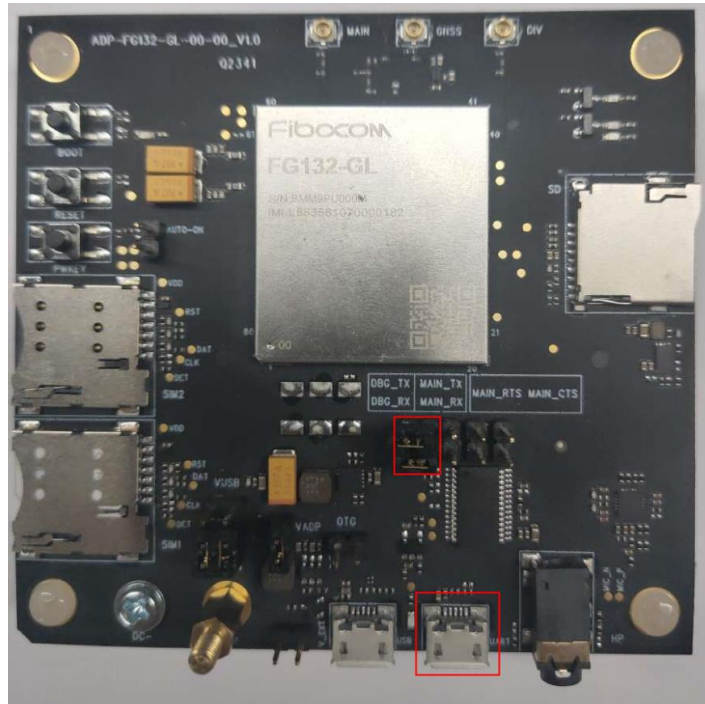


Figure 16. Debug UART jumper and connection mode


```
[ ~ Serial-COM16 x]
[ 66.449404] ++++ /etc/scripts/init.qti.kernel.debug.sh -> enable_stm_events START
[ 66.472948] ++++ /etc/scripts/init.qti.kernel.debug.sh -> enable_stm_events END
[ 66.480385] ++++ /etc/scripts/init.qti.kernel.debug.sh -> enable_cti_flush_for_etf START
[ 66.490418] ++++ /etc/scripts/init.qti.kernel.debug.sh -> enable_cti_flush_for_etf END
[ 66.498896] ++++ /etc/scripts/init.qti.kernel.debug.sh -> enable_modem_cmb START
[ 66.507157] coresight-tpda 24806000.tpda: TPDA import 1 enabled
[ 66.513421] coresight-dummy soc:tpdm@24801000: Dummy source enabled
[ 66.574638] coresight-tpda 24806000.tpda: TPDA import 2 enabled
[ 66.580660] coresight-dummy soc:tpdm@24802000: Dummy source enabled
[ 66.637081] coresight-tpda 24806000.tpda: TPDA import 3 enabled
[ 66.643409] coresight-dummy soc:tpdm@24803000: Dummy source enabled
[ 66.697407] coresight-tpda 24806000.tpda: TPDA import 4 enabled
[ 66.703776] coresight-dummy soc:tpdm@24804000: Dummy source enabled
[ 66.757172] ++++ /etc/scripts/init.qti.kernel.debug.sh -> enable_modem_cmb END
[ 66.764974] ++++ /etc/scripts/init.qti.kernel.debug.sh -> START dcc settings
[ 66.843926] msm-dcc 240ff000.dcc_v2: DCC list passed 4
[ 66.849273] msm-dcc 240ff000.dcc_v2: All values written to enable.
[ 66.856071] msm-dcc 240ff000.dcc_v2: DCC list passed 6
[ 66.861335] msm-dcc 240ff000.dcc_v2: All values written to enable.
[ 66.867989] ++++ /etc/scripts/init.qti.kernel.debug.sh -> END dcc settings
[ 66.875253] ++++ /etc/scripts/init.qti.kernel.debug.sh -> ENABLE-FTRACE START
[ 66.888898] ++++ /etc/scripts/init.qti.kernel.debug.sh -> ENABLE-FTRACE END
[ 66.896709] ++++ /etc/scripts/init.qti.kernel.debug.sh -> enable_sdxbaagha_debug_debug END
[ 66.905545] ++++ /etc/scripts/init.qti.kernel.debug.sh -> END qdssconfig for SDXBAAGHA
[ 67.624364] Try to start wlan_services based on procd
[ 68.492324] perf: interrupt took too long (3268 > 3196), lowering kernel.perf_event_max_sample_rate to 61100
[ 74.970470] process_accept_req: 22 callbacks suppressed
[ 74.970501] smcinvoke: process_accept_req: Setting pid:2121, server id : 38 state to defunct
[ 74.985424] smcinvoke: process_accept_req: Setting pid:2120, server id : 38 state to defunct
[ 74.994784] smcinvoke: process_accept_req: Setting pid:2119, server id : 38 state to defunct
[ 75.004023] smcinvoke: process_accept_req: Setting pid:2118, server id : 38 state to defunct

BusyBox v1.35.0 (2023-04-27 20:28:15 UTC) built-in shell (ash)

 _   _          _ 
| |_| |        | |
| |_| |__      | |__
|  __//       |  __//
|_| \_        |_| \_
W I R E L E S S F R E E D O M

-----
OpenWrt 22.03.5, r20134-5f15225c1e
=====
WARNING! =====
There is no root password defined on this device!
Use the "passwd" command to set up a new password
in order to prevent unauthorized SSH logins.
=====
root@OpenWrt:/#
```

Figure 17. Debug serial log



The default version only has bootloader logs. Only debug version has terminals.

6 Data Dialing (RMNET)

6.1 Dialing Principle

Rmnet is the network interface of Qualcomm NDIS, which is the evolution of Qualcomm platform to ECM. It also belongs to CDC-ECM, and their specific difference lies in the different ways of encapsulating USB commands, the used USB interfaces, and the definition of endpoints. RMNET dialing requires special driver support (is integrated in *Fibocom_Windows_USB_Drivers*).

6.2 Quick Dialing

6.2.1 Setting USB Mode

Run AT+GTUSBMODE? to query the current USB mode.

```
AT+GTUSBMODE?  
+GTUSBMODE: 37  
OK
```

If the returned mode is not 37, execute AT+GTUSBMODE=37, and then execute AT+CFUN=15 to restart the module.

```
AT+GTUSBMODE=37  
OK  
AT+CFUN=15  
OK
```

6.2.2 Checking the NIC Driver

Check that the Fibocom USB WWAN Adapter NIC driver is installed properly in the Device Manager.



Figure 18. NIC driver

6.2.3 Connecting the Network

Click the network icon in the lower right corner of PC, and find the mobile phone network option in the pop-up menu. Select **Let Windows keep me connected**.

Click **Connect**.

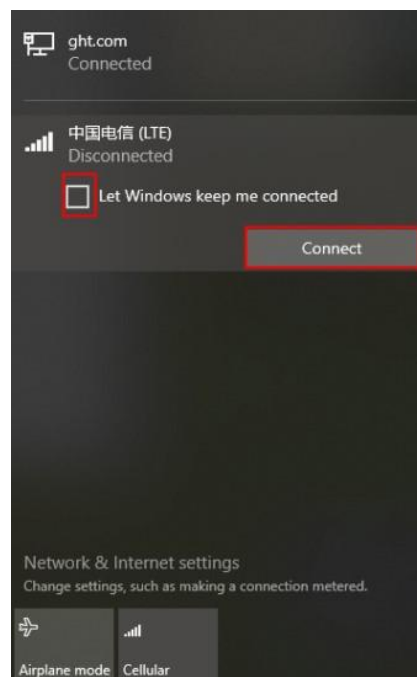


Figure 19. Dialing connection

Check the connection status. When the connection is successful, it will indicate that it is connected.

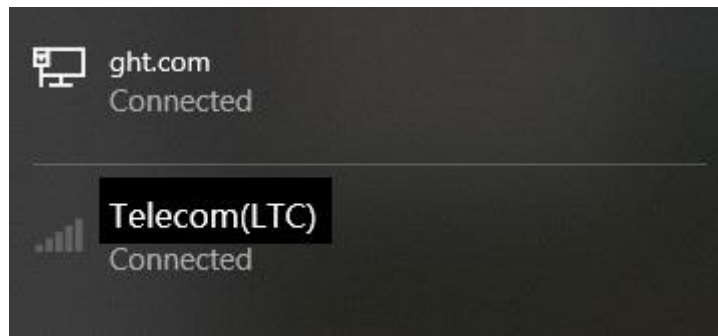


Figure 20. The connection is successful

Ping the package to check network functions.

```
Administrator: Command Prom...
Primary WINS Server . . . . . : 192.168.148.2
NetBIOS over Tcpip. . . . . : Enabled

Mobile Broadband adapter 手机网络 23:

Connection-specific DNS Suffix . :
Description . . . . . : Fibocom USB WWAN Adapter #2
Physical Address. . . . . : 00-A0-C6-00-00-38
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
IPv6 Address. . . . . : 240e:454:42f0:a14:dd84:8aed:4123:1a55(Preferred)
IPv6 Address. . . . . : 240e:454:42f0:a14:f4e9:ad52:76d1:8c2e(Preferred)
Temporary IPv6 Address. . . . . : 240e:454:42f0:a14:8401:239c:b02f:7dc6(Preferred)
IPv4 Address. . . . . : 10.44.208.29(Preferred)
Subnet Mask . . . . . : 255.255.255.252
Default Gateway . . . . . : 240e:454:42f0:a14:dc0f:de38:b1bd:9e0a
                          fe80::dc0f:de38:b1bd:9e0a%17
                          10.44.208.30
DNS Servers . . . . . : 240e:f:a::8
                          240e:f:a0b::6
                          61.134.1.6
                          218.20.19.40
NetBIOS over Tcpip. . . . . : Enabled

C:\Users\Administrator>
C:\Users\Administrator>ping -6 www.qq.com

Pinging ins-r23tsuuf.ias.tencent-cloud.net [240e:e1:a800:120::36] with 32 bytes of data:
Reply from 240e:e1:a800:120::36: time=55ms
Reply from 240e:e1:a800:120::36: time=49ms
Reply from 240e:e1:a800:120::36: time=47ms
```

Figure 21. Network functions