

simsquare Cat.M1 module Hands-On Guide

- Raspberry Pi (with PPP) -

version 1.0

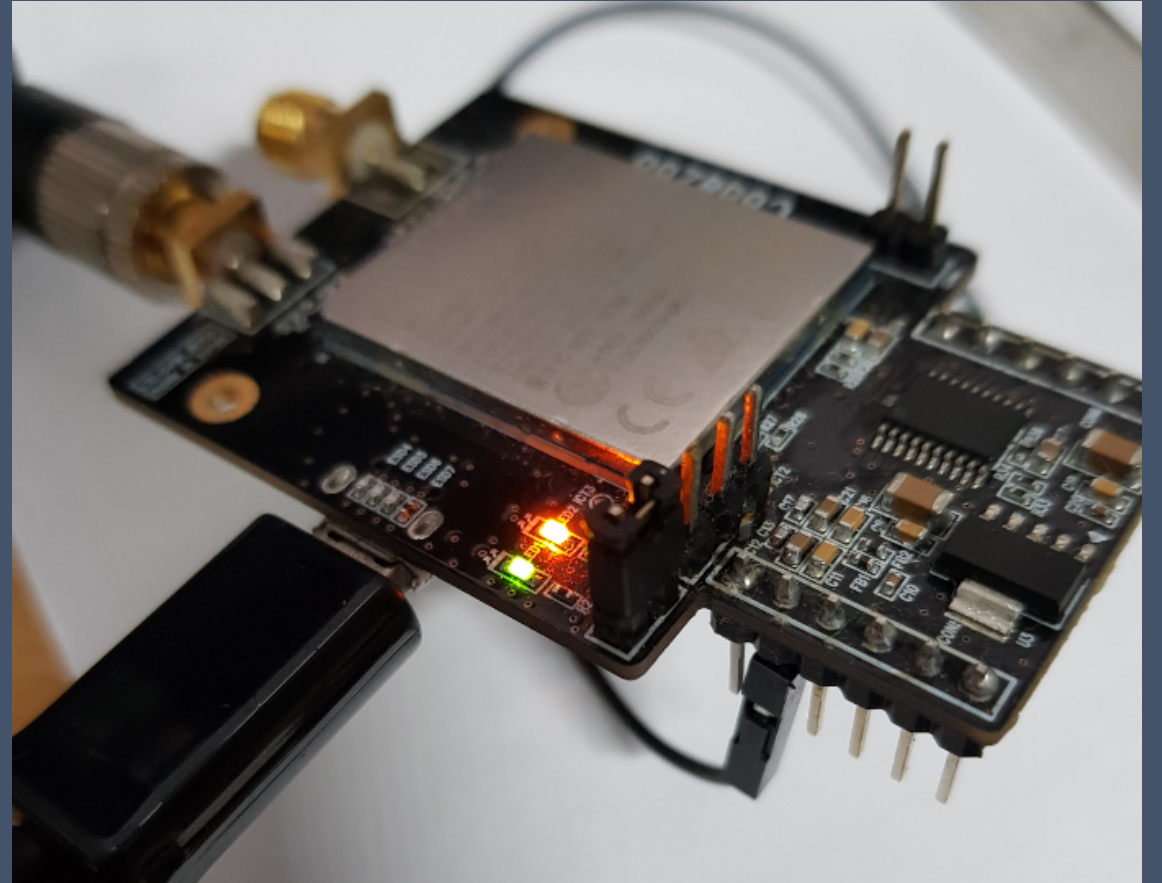
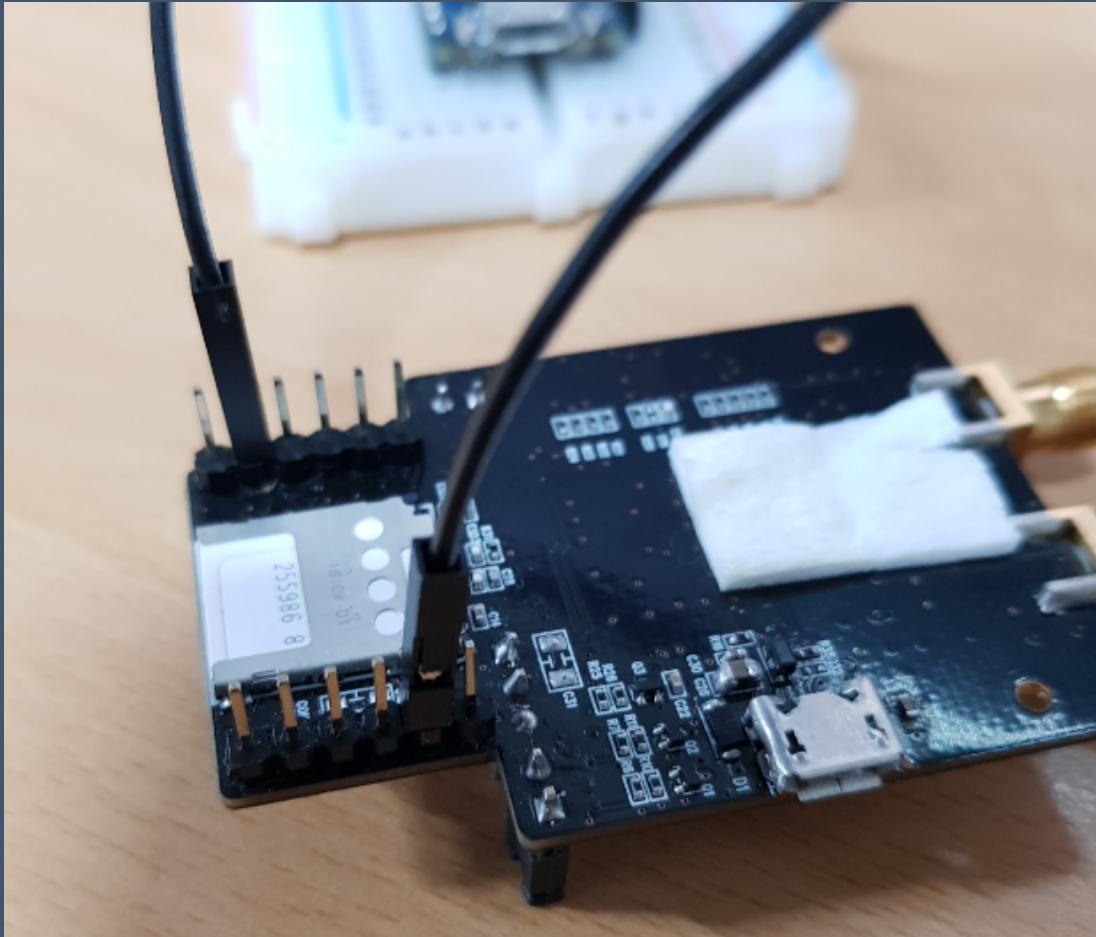
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www.simsquare.net

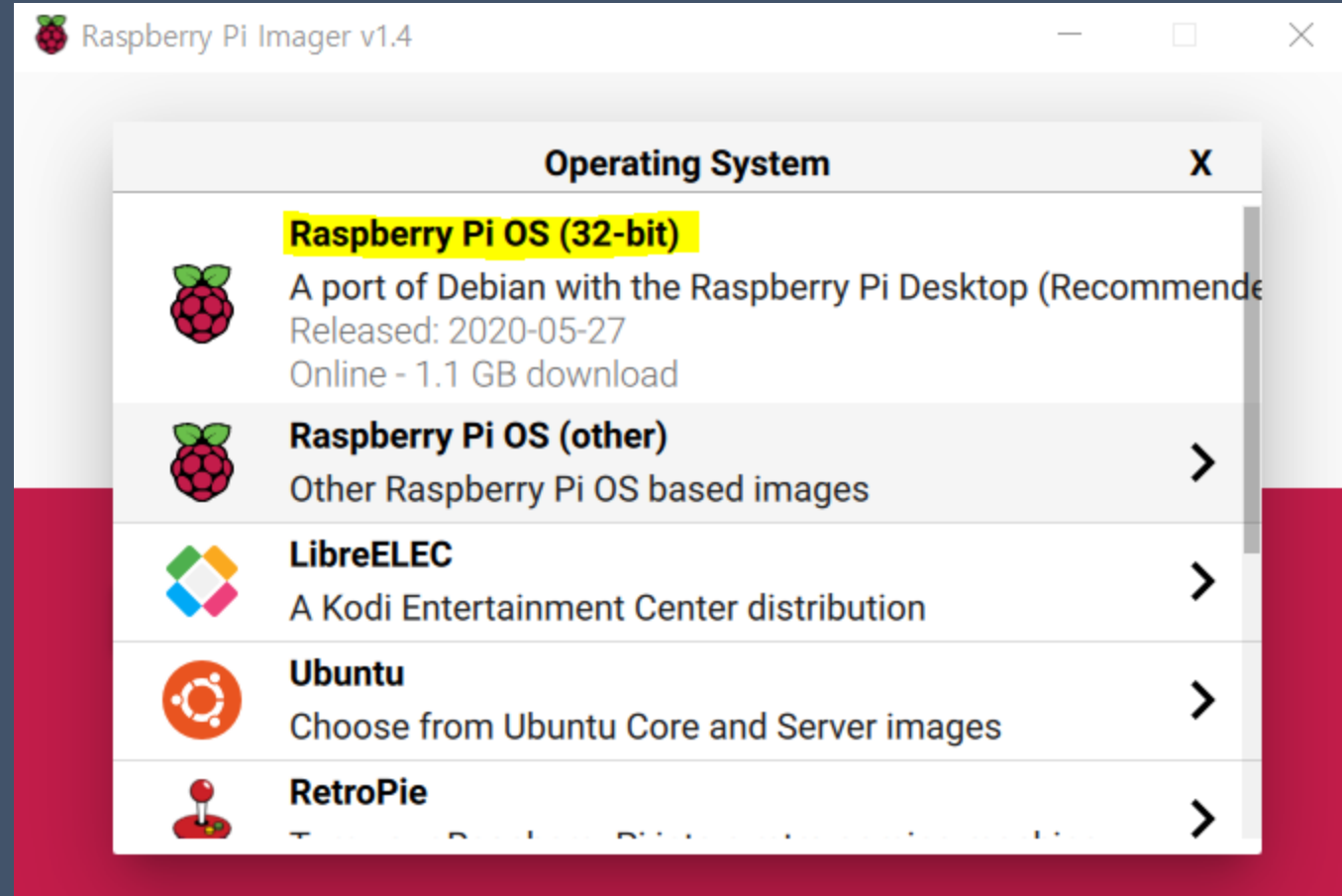
1. CAT.M1 Hardware

AT Command test procedures once it's connected via USB

1. Connect No. 5 from left on bottom to No.2 from right on top as in the photo below
2. Connect Micro USB cable to the USB port of Raspberry Pi board



2. CAT.M1 practice - Raspberry Pi OS install





Raspberry Pi Imager v1.4



Raspberry Pi

Operating System

RASPBERRY PI OS (32-BIT)

SD Card

SDHC CARD

WRITE



Raspberry Pi Imager v1.4



Raspberry Pi

Operating System

RASPBERRY PI OS (32-BIT)

SD Card

SDHC CARD

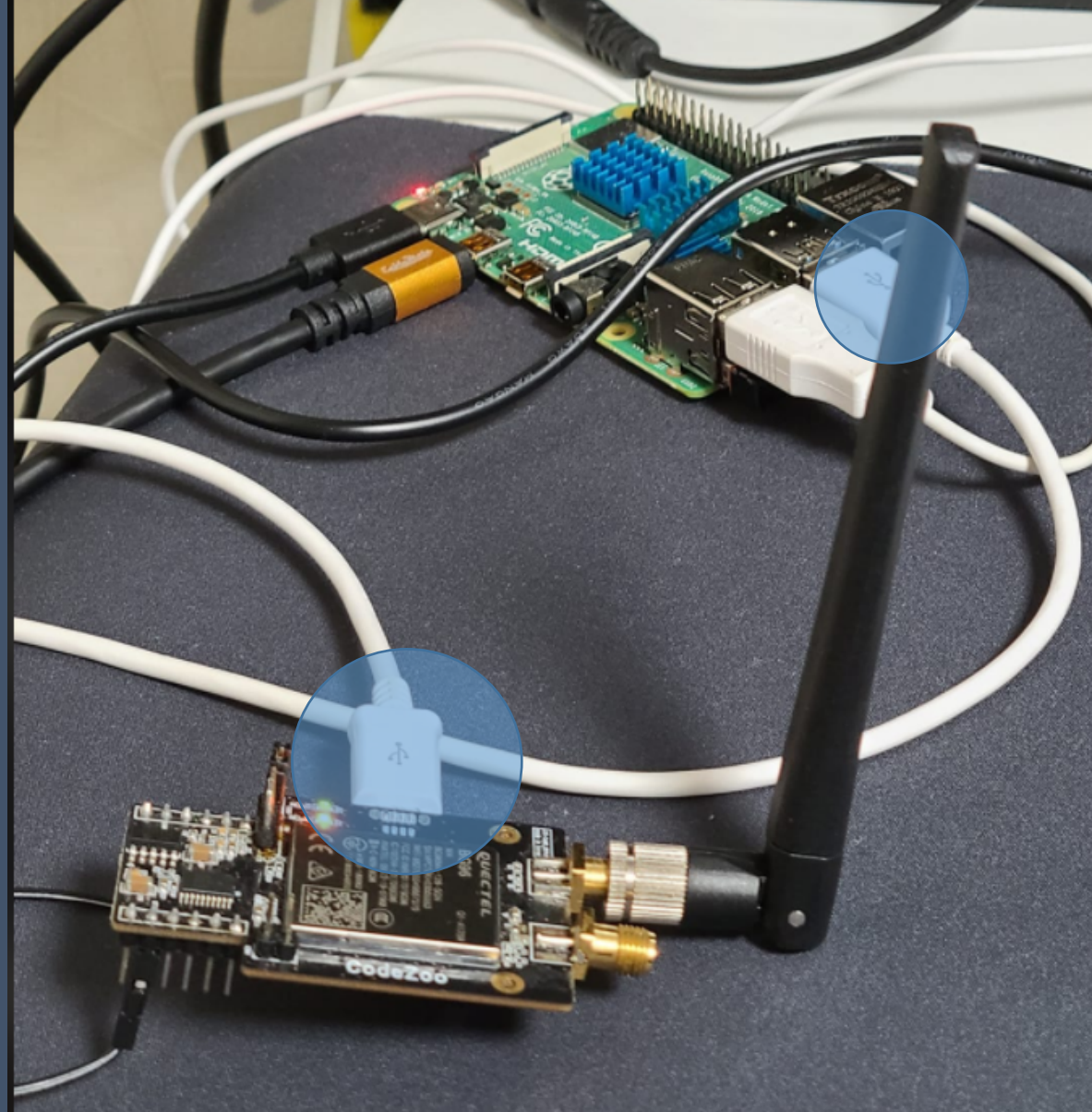
WRITE

Writing... 32%

CANCEL WRITE

3. CAT.M1 Connect

Connect Micro USB cable to the USB port of Raspberry board



4. CAT.M1 PPP install

1. Run Raspberry Pi Terminal and download the installer file.

```
wget https://raw.githubusercontent.com/sixfab/Sixfab\_PPP\_Installer/master/ppp\_install\_standalone.sh
```

2. Change the permission

```
sudo chmod +x ppp_install_standalone.sh
```

3. Run ppp_install_standalone.sh

```
sudo ./ppp_install_standalone.sh
```

4. CAT.M1 PPP install

4. Select 6: 3G/4G Base HAT.
6 (Enter)

```
Please choose your Sixfab Shield/HAT:  
1: GSM/GPRS Shield  
2: 3G, 4G/LTE Base Shield  
3: Cellular IoT App Shield  
4: Cellular IoT HAT  
5: Tracker HAT  
6: 3G/4G Base HAT  
6 
```


4. CAT.M1 PPP install

5. Enter APN

internet.lte.cxn

```
pi@raspberrypi: ~  
File Edit Tabs Help  
Need to get 436 kB of archives.  
After this operation, 1,107 kB of additional disk space will be used.  
Get:1 http://ftp.harukasan.org/raspbian/raspbian buster/main armhf libpcap0.8 a  
rmhf 1.8.1-6 [124 kB]  
Get:2 http://ftp.harukasan.org/raspbian/raspbian buster/main armhf ppp armhf 2.  
4.7-2+4.1+deb10u1 [312 kB]  
Fetched 436 kB in 7s (60.7 kB/s)  
Selecting previously unselected package libpcap0.8:armhf.  
(Reading database ... 95606 files and directories currently installed.)  
Preparing to unpack .../libpcap0.8_1.8.1-6_armhf.deb ...  
Unpacking libpcap0.8:armhf (1.8.1-6) ...  
Selecting previously unselected package ppp.  
Preparing to unpack .../ppp_2.4.7-2+4.1+deb10u1_armhf.deb ...  
Unpacking ppp (2.4.7-2+4.1+deb10u1) ...  
Setting up libpcap0.8:armhf (1.8.1-6) ...  
Setting up ppp (2.4.7-2+4.1+deb10u1) ...  
Created symlink /etc/systemd/system/multi-user.target.wants/pppd-dns.service →  
/lib/systemd/system/pppd-dns.service.  
Processing triggers for systemd (241-7~deb10u4+rpi1) ...  
Processing triggers for man-db (2.8.5-2) ...  
Processing triggers for libc-bin (2.28-10+rpi1) ...  
What is your carrier APN?  
[ ]
```

What is your carrier APN?
m2m-catm1.default.lguplus.co.kr []

What is your carrier APN?
internet.lte.cxn []

4. CAT.M1 PPP install

6. Enter other configurations

1) username and password : n

2) device communication port : ttyUSB3

3) activate auto connect/reconnect service at R.Pi boot up : y

```
Does your carrier need username and password? [Y/n]
```

```
n
```

```
What is your device communication PORT? (ttyS0/ttyUSB3/etc.)
```

```
ttyUSB3
```

```
Do you want to activate auto connect/reconnect service at R.Pi boot up? [Y/n]
```

```
y
```

4. CAT.M1 PPP install

7. Hit ENTER and re-run Raspberry Pi and then PPP will be applied.

```
--2020-09-01 05:37:39-- https://raw.githubusercontent.com/sixfab/Sixfab_PPP_Installer/master/ppp_installer/reconnect_basehat
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 151.101.76.133
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|151.101.76.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 314 [text/plain]
Saving to: 'reconnect.sh'

reconnect.sh      100%[=====>]          314  --.-KB/s    in 0s

2020-09-01 05:37:39 (4.50 MB/s) - 'reconnect.sh' saved [314/314]

Created symlink /etc/systemd/system/multi-user.target.wants/reconnect.service → /etc/systemd/system/reconnect.service.
Press ENTER key to reboot
```

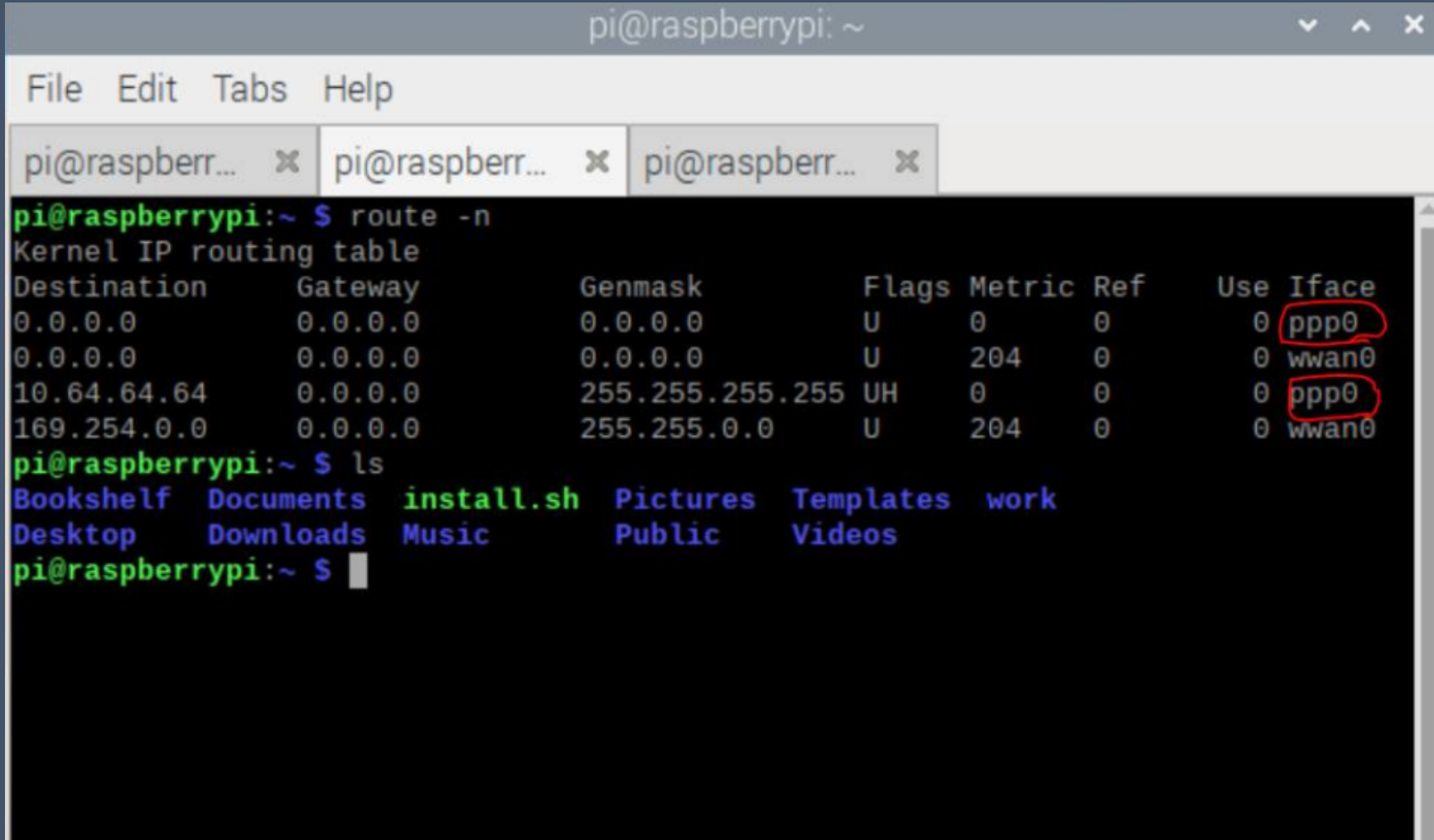
5. CAT.M1 PPP – operability check

1. Run ifconfig in Raspberry Pi Terminal and check PPP0

```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberr... x pi@raspberr... x pi@raspberr... x  
RX packets 0 bytes 0 (0.0 B)  
RX errors 0 dropped 0 overruns 0 frame 0  
TX packets 0 bytes 0 (0.0 B)  
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
inet 127.0.0.1 netmask 255.0.0.0  
inet6 ::1 prefixlen 128 scopeid 0x10<host>  
loop txqueuelen 1000 (Local Loopback)  
RX packets 0 bytes 0 (0.0 B)  
RX errors 0 dropped 0 overruns 0 frame 0  
TX packets 0 bytes 0 (0.0 B)  
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
ppp0: flags=4305<UP,POINTOPOINT,RUNNING,NOARP,MULTICAST> mtu 1500  
inet 10.126.86.39 netmask 255.255.255.255 destination 10.64.64.64  
ppp txqueuelen 3 (Point-to-Point Protocol)  
RX packets 3127 bytes 2947765 (2.8 MiB)  
RX errors 0 dropped 0 overruns 0 frame 0  
TX packets 3199 bytes 288567 (281.8 KiB)  
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
wwan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
inet 169.254.84.213 netmask 255.255.0.0 broadcast 169.254.255.255  
inet6 fe80::ba0a:2726:3666:a87 prefixlen 64 scopeid 0x20<link>  
ether 9e:19:92:00:69:93 txqueuelen 1000 (Ethernet)  
RX packets 0 bytes 0 (0.0 B)  
RX errors 0 dropped 0 overruns 0 frame 0  
TX packets 0 bytes 0 (0.0 B)  
TX errors 60 dropped 0 overruns 0 carrier 0 collisions 0  
  
pi@raspberrypi:~ $
```

5. CAT.M1 PPP – operability check

2. Run route -n in Raspberrry Pi Terminal and check PPP0 device.



```
pi@raspberrypi: ~
File Edit Tabs Help
pi@raspberr... x pi@raspberr... x pi@raspberr... x
pi@raspberrypi:~ $ route -n
Kernel IP routing table
Destination      Gateway          Genmask         Flags Metric Ref    Use Iface
0.0.0.0          0.0.0.0          0.0.0.0         U        0      0        0 ppp0
0.0.0.0          0.0.0.0          0.0.0.0         U        204    0        0 wwan0
10.64.64.64      0.0.0.0          255.255.255.255 UH        0      0        0 ppp0
169.254.0.0      0.0.0.0          255.255.0.0     U        204    0        0 wwan0
pi@raspberrypi:~ $ ls
Bookshelf  Documents  install.sh  Pictures  Templates  work
Desktop    Downloads  Music       Public    Videos
pi@raspberrypi:~ $
```

5. CAT.M1 PPP 동작 확인

3. Use Python test codes and test

python3 python_echo_client.py

```
pi@raspberrypi: ~/work/python_echo_client
File Edit Tabs Help
pi@raspberr... x pi@raspberr... x pi@raspberr... x

import socket
import sys

#Create a TCP/IP socket
sock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

#Connect the socket to the port where the server is listening
server_address = ('echo.mbedcloudtesting.com', 7)
print('connecting to {}port {}'.format(*server_address))
sock.connect(server_address)

try:

    #Send data
    message = b'This is the message. It will be repeated.'
    print('sending {!r}'.format(message))
    sock.sendall(message)

    #Look for the response
    amount_received = 0
    amount_expected = len(message)

    while amount_received < amount_expected:
        data = sock.recv(16)
        amount_received += len(data)
        print('received {!r}'.format(data))

finally:
    print('closing socket')
    sock.close()

~
~
```

33,0-1 Bot

Thank you!