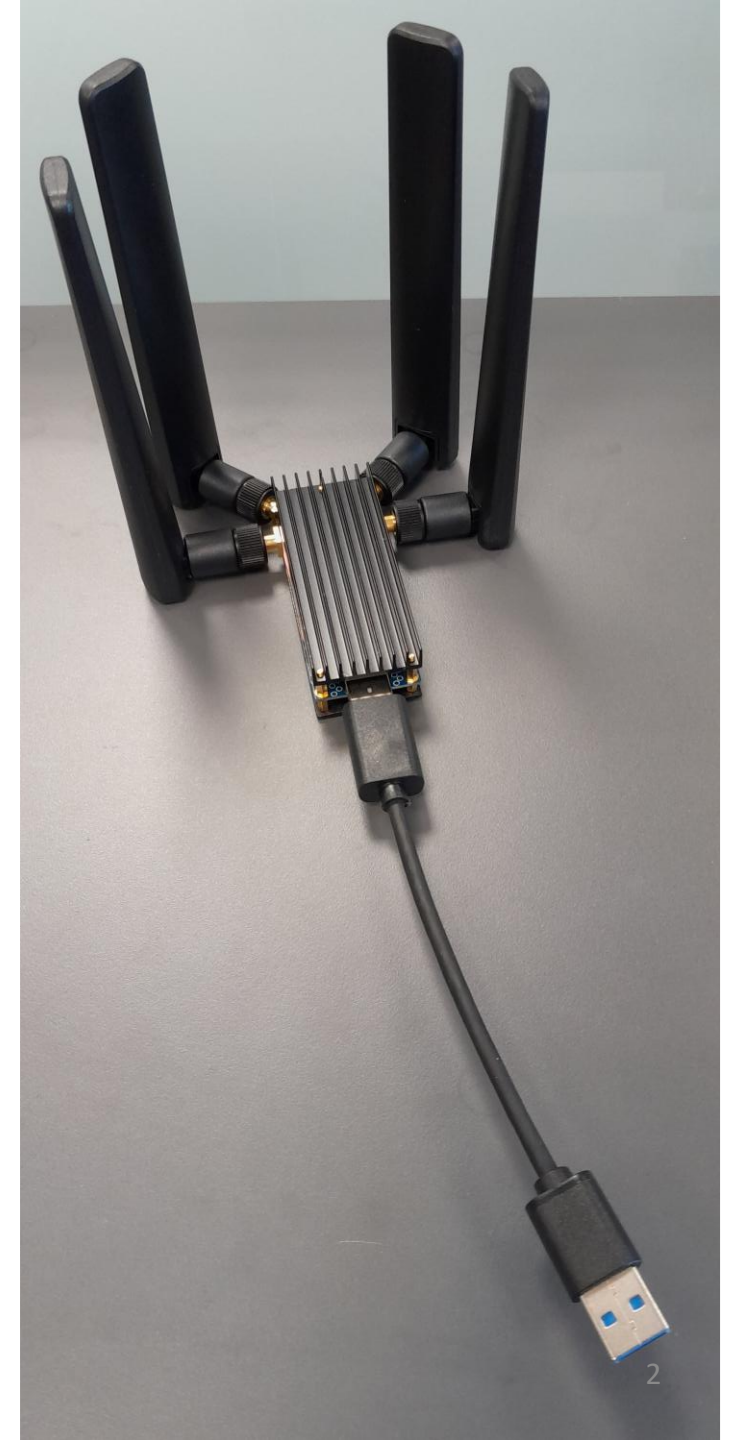
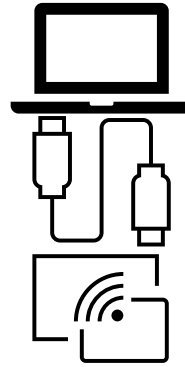


Lab 7

Connect Quectel UE to academic 5G network in Taltech

Devices

- Computer
- Modem RM500Q-GL and UE device
- Connect UE device to USB port



Setup

- Connect UE device to USB port to computer
- Open Computer management → Device manager
 - Check what COM port is in use for „Quectel USB AT Port“
- Open QCOM
 - C:\Program Files\qcom_v1-8_en\QCOM_win64.exe
- Connect to COM port number, with settings
 - Baudrate 115200, Stopbits 1, Parity None, ByteSize 8, Flow control „No Ctrl Flow“

AT commands

- User manual in moodle
Quectel_RG520N&RG525F&RG5x0F&R
M5x0N_Series_AT_Commands_Manual_
V1.0.0_Preliminary_20230731.pdf

General commands

- Set command echo
 - **ATE1**
- UE identification info
 - **ATI**
- Network info
 - **AT+QNWINFO**
- SIM info
 - **AT+CIMI**
- Supported operators (long response time)
 - **AT+COPS=?**
- Selected operator
 - **AT+COPS?**

AT+COPS=4,2,"24701"

Connect to network

- Set preferred 5G NR
 - `AT+QNWPREFCFG="nr5g_band"`
- Query primary serving cell
 - `AT+QENG="servingcell"`
- Check if UE is registered to 5G
 - `AT+C5GREG?`
- Enable network registration to 5G for UE
 - `AT+C5GREG=2`
- Roaming preferences
 - `AT+QNWPREFCFG=,,roam_pref,,`
 - `+QNWPREFCFG: "roam_pref",255` ← allowed to roam on any network

PDP contexts

- Check what PDP contexts are available
 - **AT+CGDCONT?**
- Check what PDP context is activated
 - **AT+CGACT?**
- Activate PDP context number 4
 - **AT+CGACT=4,1**
- If PDP context 1 cannot be activated
 - Create new PDP context number 4 to UE (network supports only IPv4 not both IPv4 and IPv6)
 - **AT+CGDCONT=4,"IP", ""**

Packet domain commands (IP related)

- Check my IP (shows IP for all PDP contexts in UE)
 - **AT+CGPADDR**
- Ping command example (PDP context number 1, IP 8.8.8.8, timeout 5 seconds, number of ping requests 10)
 - **AT+QPING=1,"8.8.8.8",5,10**
- Restart (if needed)
 - **AT+CFUN=1,1**

PING

2.1.11. AT+QPING Ping a Remote Server

The command is used to test the Internet protocol reachability of a host. Before using ping tools, the host should activate the context corresponding to <contextID> via AT+QIACT first. It will return the result during <timeout> and the default value of <timeout> is 4 seconds.

AT+QPING Ping a Remote Server	
Test Command AT+QPING=?	Response +QPING: (1-16),<host>,(1-255),(1-10) OK
Write Command AT+QPING=<contextID>,<host>[,<timeout>[,<pingnum>]]	Response If ping a remote server successfully, response: OK +QPING: <result>[,<IP_address>,<bytes>,<time>,<ttd>]<CR><LF>...] +QPING: <finresult>[,<sent>,<rcvd>,<lost>,<min>,<max>,<avg>] If there is any error, response: ERROR

Tasks

1. Check and explain network info (output of QNWINFO)
2. Check and explain values of signal parameters of serving and neighbour cells
3. Connect your UE to the 5G network and
 1. Ping 8.8.8.8
 2. Ping 192.168.100.2
 3. Ping each other UE in the classroom
4. Explain ping results