Onomondo SIMCOM connection test.

Introduction.

This document will provide a minimum command set to establish connection using the SIM7070G and SIM7600x modules. The connection can be established by manually issuing commands to the cellular modem ('modules'). To easy testing a set of python scripts to issue commands has been supplied.

Figure 1: SIM7070G. Source: https://www.waveshare.com/sim7070g-cat-m-nb-iot-gprs-hat.htm

Connecting to the device.

In order to get the device running the proper SIMCOM driver must be installed.

For SIM7070G this https://www.waveshare.com/w/upload/2/2f/SIM7070_SIM7080_WIN7_WIN10_USB_Driver_V1.00.rar driver is needed. The https://www.waveshare.com/wiki/SIM7070G_Cat-M/NB-IoT/GPRS_HAT provides detailed info.

For SIM7600 an additional driver might be needed (possibly a single driver is enough. Plug the device in and check if it is recognized). Otherwise, https://www.waveshare.com/wiki/File:SIM7X00-Driver.7z should do the trick!

To manually push AT commands, use PuTTY or similar:

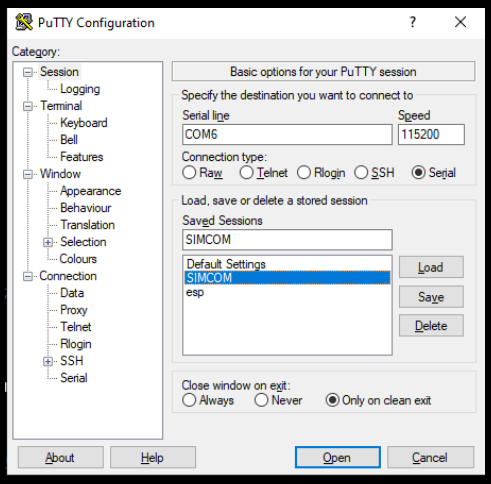

Figure 2: PuTTY configuration

Generally, the port will be COM6, but it can easily be identified in Windows Device Manager:

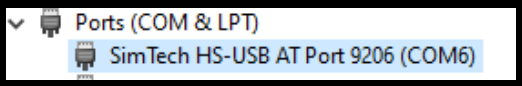

Figure 3: AT port in Windows Device Manager

Testing the connection.

Open the serial port and type 'AT'. The modem should respond with 'OK'.

Running the script.

This assumes that a distribution of Python is installed. Launch a terminal from the script directory and run the following command: pip install requirements.txt to install the required packages.

The connectionTest.py is the main script. Edit this to change module and run additional tests (e.g. initialize the TCP stack on the module). The default will 'just' get the module to attach, activate the PDP context, get the connection type and the IP address. Make sure the port is not used by PuTTY still (close the PuTTY terminal if still open).

```
8   # initialize the modem
9   modem = SIM7070G("COM6")
10  # modem = SIM7600x("COM6")
```

Figure 4: Code snippet. Here the different module can be selected.

From the terminal run python connectionTest.py. The script should start sending commands to the module. Furthermore, a log (at.txt) is created in the same directory.

```
(base) C:\Users\peter\OneDrive\Onomondo\SIM7xxxPython>python connectionTest.py
>>>>AT
AT
OK

>>>>AT+CFUN=0
AT+CFUN=0
>>>>AT+CFUN=0

>>>>AT+CFUN=0

OK

>>>>AT+CGDCONT=1,"IP","onomondo"
AT+CGDCONT=1,"IP","onomondo"
OK

>>>>AT+CFUN=1
AT+CFUN=1
>>>>AT+CFUN=1

OK
```

Figure 5: Script running

Manual test.

The modules can be initialized manually. In general, commands have to be re-issued if the expected response doesn't match.

SIM7070G:

Command:	**Expected response:**	**Comments:**
AT	OK	
AT+CFUN=0	OK	Turn off RF
AT+CGDCONT=1,"IP","onomondo"	OK	Define PDP context
AT+CFUN=1	OK	Turn on RF
AT+CPIN?	+CPIN: READY	Check if SIM is ready
AT+CMEE=2	OK	Enable debug messages
AT+CREG=2	OK	Enable result code
AT+COPS=0	+CREG: 5	Automatically attach to a network chosen by the module. Wait for +CREG: 5. Can take long time the first time. If modem responds with +CREG: 0 it failed and stopped trying. In this case retry the command OR check if any network can be found (AT+COPS=?). This can also be a long process.
AT+CGREG?	+CGREG: 0,5	Repeat until expected response.
AT+CGATT=1	OK	Attach GPRS service
AT+CNCFG=0,1,"onomondo"		Configure PDP context
AT+CNACT=0,1	OK +APP PDP: 0,ACTIVE	Active the network of app side
AT+CNACT?	+CNACT: 0,1,"XXX.XX.XX.XX" +CNACT: 1,0,"0.0.0.0" +CNACT: 2,0,"0.0.0.0" +CNACT: 3,0,"0.0.0.0"	Check if the network was successfully activated. We should see an IP address here.

Additional useful commands:

AT+CPSI? – Get the connection type.

AT+COPS=2 – Detach from network.

AT+CSQ – Get signal strength.

AT+COPS=1,”Telenor DK”,7 –Attach to a specific network (Telenor DK in this case). Replace

AT command log example.

A log of a test run has been included (SIM7070G).

```
AT
OK

AT+CFUN=0
OK

AT+CGDCONT=1,"IP","onomondo"                    Define PDP context
OK

AT+CFUN=1                                       Enable the cellular radio
OK

AT+CPIN?
+CPIN: READY                                    SIM card is ready
OK

AT+CMEE=2
OK

AT+CREG=2
OK

AT+COPS?
+COPS: 0
OK

AT+COPS=2
OK
+CREG: 0                                        Module is deregistered and not actively trying
                                                to attach.

AT+CNMP=38                                      Prefer LTE
OK

AT+COPS=0                                       Attach to a network. Module decides
OK
+CREG: 2
+CREG: 3
+CREG: 5,"1AF","108E",0                         Attached and roaming

AT+CGREG?
+CGREG: 0,2
OK

AT+CGREG?
+CGREG: 0,2
OK

AT+CGREG?
+CGREG: 0,5                                     GPRS attached
OK
```

```
*PSUTTZ: 20/12/03,11:03:44","+04",0

AT+CPSI?
+CPSI: GSM,Online,238-01,0x01af,4238,44 EGSM 900,-75,0,34-34
OK

AT+CGATT=1
OK

AT+CNCFG=0,1,"onomondo"
OK

AT+CNACT=0,1
OK


+APP PDP: 0,ACTIVE

AT+CNACT?
+CNACT: 0,1,"100.67.83.29"
+CNACT: 1,0,"0.0.0.0"
+CNACT: 2,0,"0.0.0.0"
+CNACT: 3,0,"0.0.0.0"
OK

AT+CSQ
+CSQ: 19,3
OK

AT+CPSI?
+CPSI: GSM,Online,238-01,0x01af,4238,44 EGSM 900,-75,0,34-34
OK

AT+COPS?
+COPS: 0,0,"TDC Onomondo",0
OK

AT+COPS=2
OK
+CREG: 0
```

Connection type

PDP context active

Signal quality

Network registration and type

Detach