



Re-imagining Cellular IoT Solutions

Cavli C16QS EVK Connection Manual External Release Version 1.1

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VERSION HISTORY

Version	Edit	Date
1.0	Initial Version	03-03-2023
1.1	Added Setup Guide	07-03-2023



1 Introduction

1.1 Overview

This document aims to familiarize the reader on the different functionalities and interfaces of C16QS Evaluation board. It also helps the customer in getting started with the C16QS EVK.

The EVK is a tool designed for engineers, programmers and developers who are looking to:

- Debug and/or improve applications based on Cavli C16QS module.
- Develop a first-pass proof-of-concept device for new application.

1.2 References

The present document is based on the following document:

Cavli C16QS Hardware Manual



2 Interfaces

2.1 Chapter Overview

Description:

This chapter contains all the necessary information on C16QS EVK Interfaces and Pin-outs.

2.2 EVK Layout

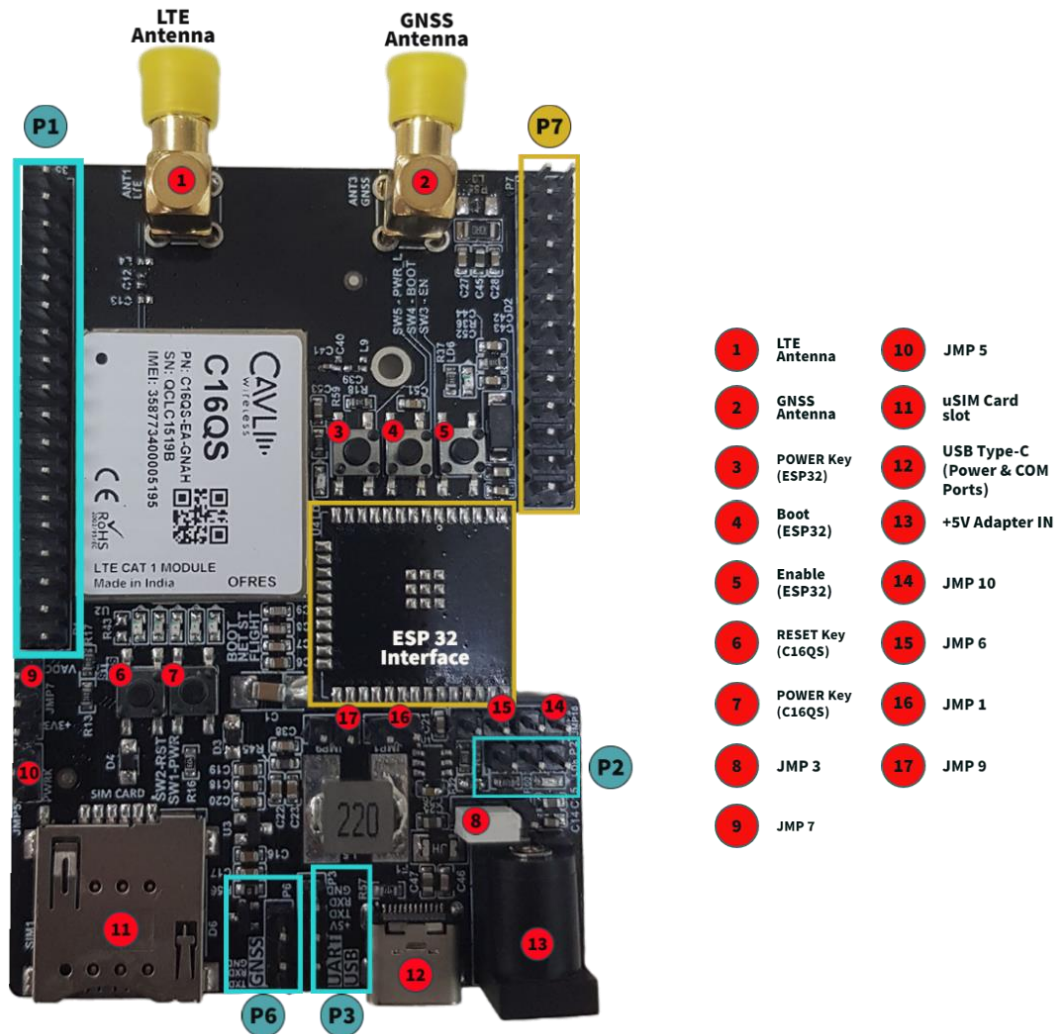


Figure 1 C16QS EVK interface Layout

2.3 Pin Layout

2.3.1 P1 Pinout – C16QS

Pin No.	Pin name	Pin No.	Pin name
1	ADC0	2	+3.3 V
3	ADC1	4	V_EXT
5	STATUS	6	AGPIO5
7	AP READ	8	GPIO7
9	TXD2 (U2 TXD)	10	DTR
11	RXD2	12	CTS
13	TXD0	14	RTS
15	RXD0	16	DCD
17	GPIO1	18	RI
19	SWDIO	20	SCL
21	SWCLK	22	SDA
23	GND	24	MISO
25	NS	26	MOSI
27	BKL	28	CLK
29	DOUT	30	CS
31	DIN	32	AGPIO
33	LRCK	34	1.8 V
35	MCLK	36	GND



2.3.2 P2 – ESP32 UART

Pin No.	Pin name	Pin No.	Pin name
1	RXD	2	TXD
3	GND		

2.3.3 P3 – AT UART(C16QS)

Pin No.	Pin name	Pin No.	Pin name
1	+5 V	2	TXD
3	RXD	4	GND

2.3.4 P6 – GNSS UART(C16QS)

Pin No.	Pin name	Pin No.	Pin name
1	GNSS_TXD	2	GNSS-RXD
3	GND		

2.3.5 P7 Pinout – ESP32

Pin No.	Pin name	Pin No.	Pin name
1	IO23	2	+3.3 V
3	IO22	4	GND
5	IO21	6	IO19
7	IO18	8	S-VP



9	IO5	10	IO17
11	S-VN	12	IO16
13	IO4	14	IO34
15	IO35	16	IO32
17	IO33	18	IO25
19	EN	20	IO26
21	IO2	22	IO15
23	IO13	24	IO27
25	IO14	26	IO12

2.3.6 JMP 3 – Input Power Jumper

Pin No.	Pin name	Pin No.	Pin name
1	5V_ADAP	2	5V (Out)
3	5V_USB		



2.4 Component description

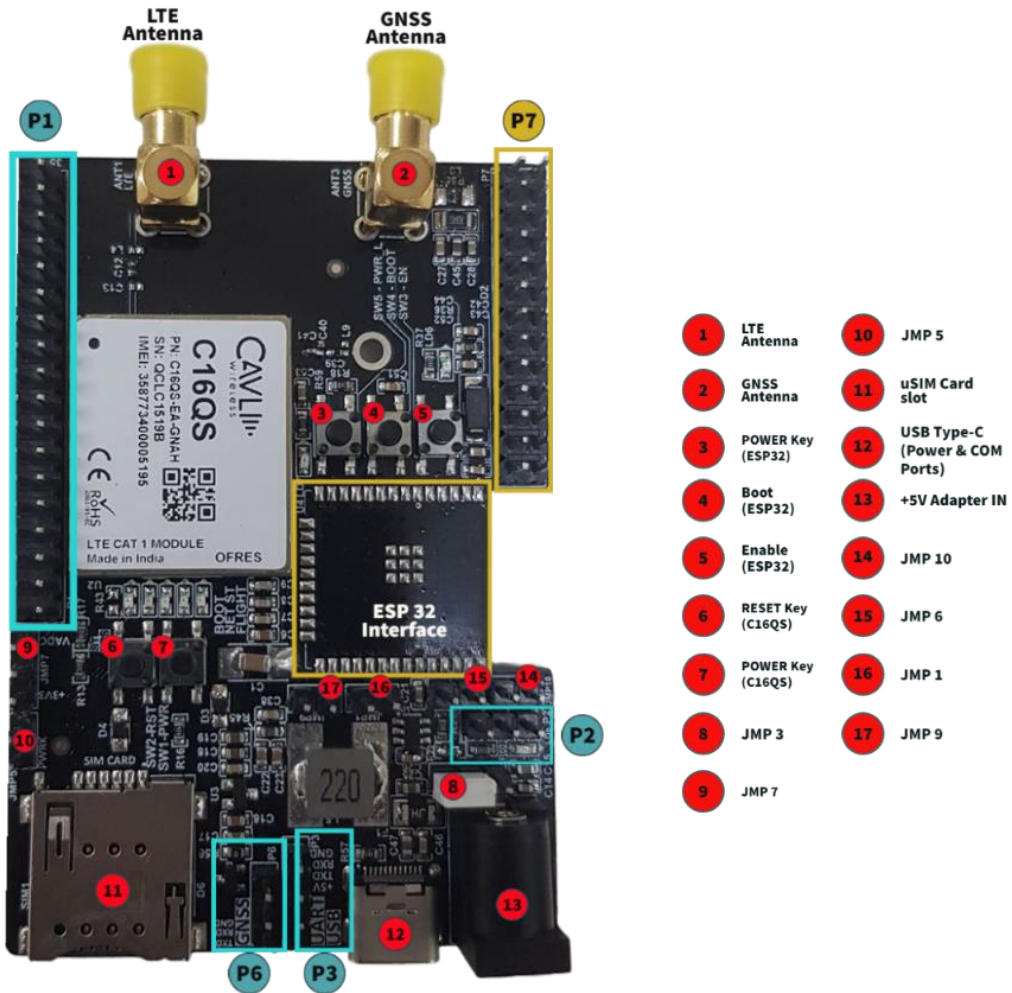


Figure 2 Component description

1. LTE Antenna Connector

C16QS EVK comes with an SMA Antenna connector from Amphenol for interfacing an external LTE Antenna.

2. GNSS ANTENNA Connector

C16QS EVK comes with an SMA Antenna connector from Amphenol for interfacing an external GNSS Antenna.



3. Power Key (ESP 32)

This button is used to power ON ESP32.

4. Boot (ESP32)

This button is used to enter flashing mode in ESP32.

5. Enable (ESP32)

This button is used to enable the 3.3V regulator of ESP32.

6. Reset Key (C16QS)

This button is used to reset the module.

7. POWER Key (C16QS)

This button is used to turn ON the module.

8. Jumper 3 (JMP 3)

This Jumper is used to switch between the voltage sources (USB Type-C and +5V Adapter). The first position enables USB Type-C as the input voltage source and the second position enables +5V Adapter as the voltage source.

9. Jumper 7 (JMP 7)

This Jumper is used to switch between voltages VADC0 and VDD_3V3 for ADC0.

10. Jumper 5 (JMP 5)

This Jumper is used to pull the Power Key to ground (low). This can be used to turn ON the module.

11. USIM Card Slot

The sim card socket type used in the C16QS EVK is a micro sim card socket.

12. USB Type-C (For Power/COM Ports)

The USB Type-C interface can be used for Powering up the device as well as for Serial communication (3xCOM Ports) – 2x AT Port and 1x Logging.



13. +5V Adapter input

This socket can be used to power up the board by connecting a 5V, 2A DC power adapter into the input jack.

14. Jumper 10 (JMP 10)

This Jumper is used to connect ESP_RxD to U1_TxD of C16QS.

15. Jumper 6 (JMP 6)

This Jumper is used to connect ESP_TxD to U1_RxD of C16QS.

16. Jumper 1 (JMP 1)

This Jumper is responsible for the connection to IO12.

It is used to bypass SW5.

17. Jumper 9 (JMP 9)

This Jumper is used to enable Flight mode (W_Disable).



3 Setup Guide

Given below are the various steps involved in the connection of C16QS with a PC:

1. Place the EVK on an insulated platform.

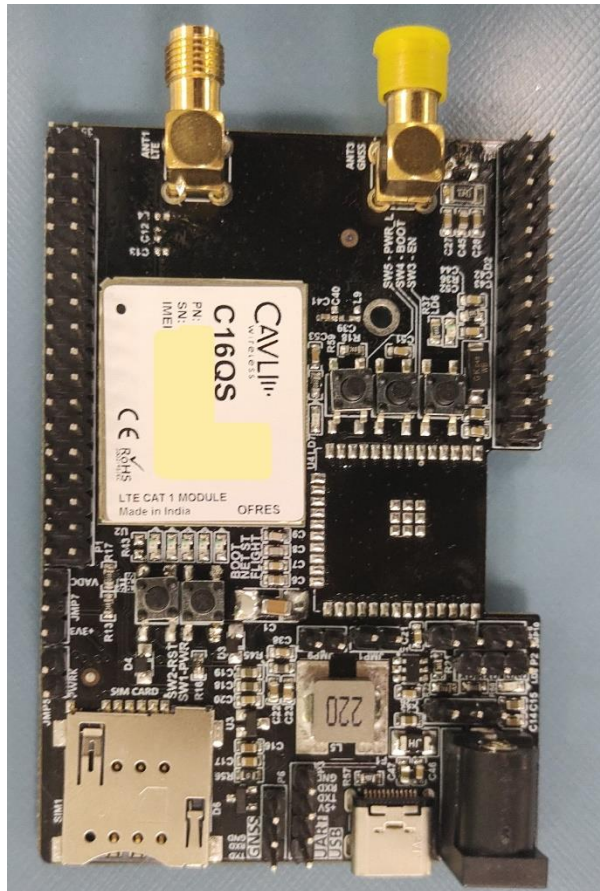


Figure 3 Placing the EVK on an insulated surface



- Place the Power Input Jumper (JMP 3) according to the input power supply.

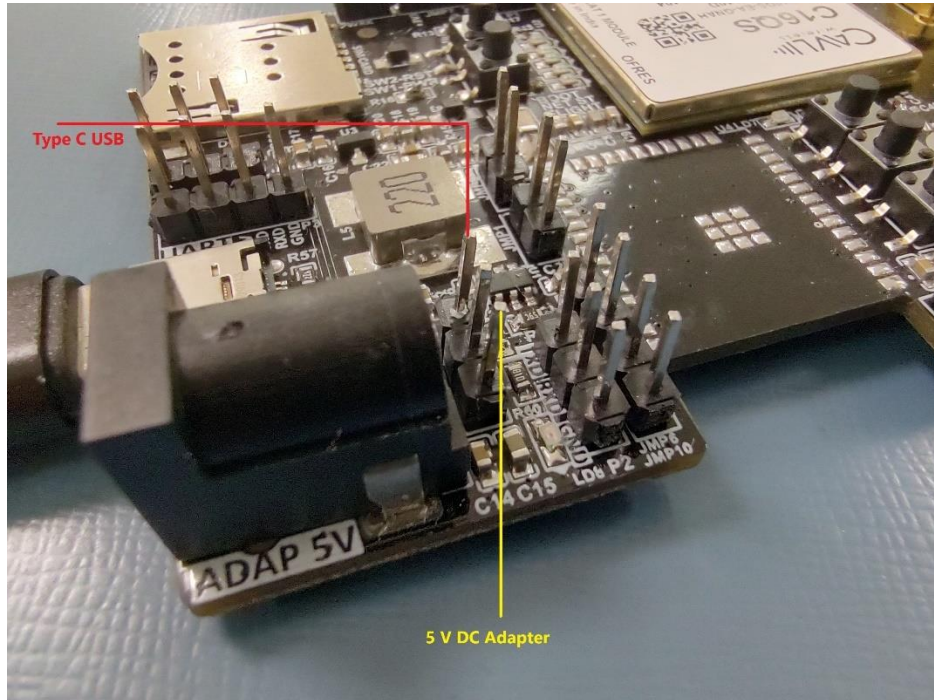


Figure 6 Jumper 3 Pinout

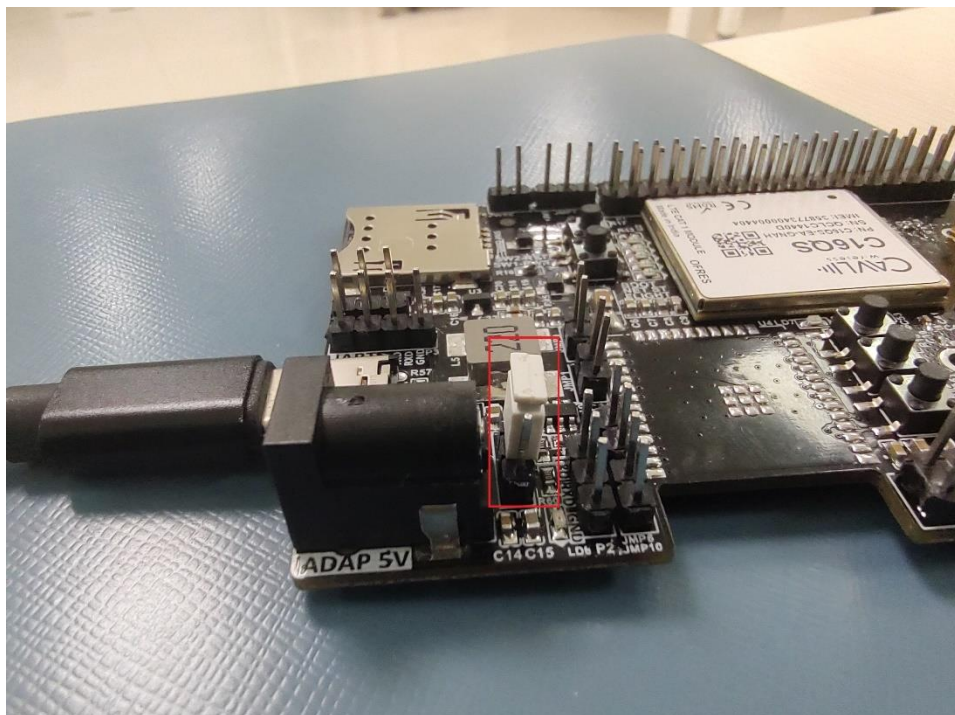


Figure 7 Placing Jumper according to Power Source



- Once the Power Input LED (Red Colour next to the JMP) turns ON, it means the supply is connected to the power source.

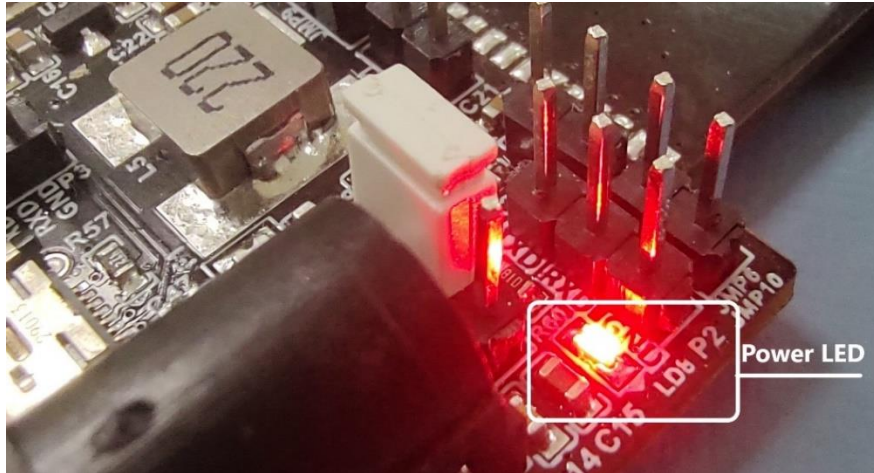


Figure 8 LED indicating the power source is connected

- Press the Power ON Button to turn ON the C16QS Module.

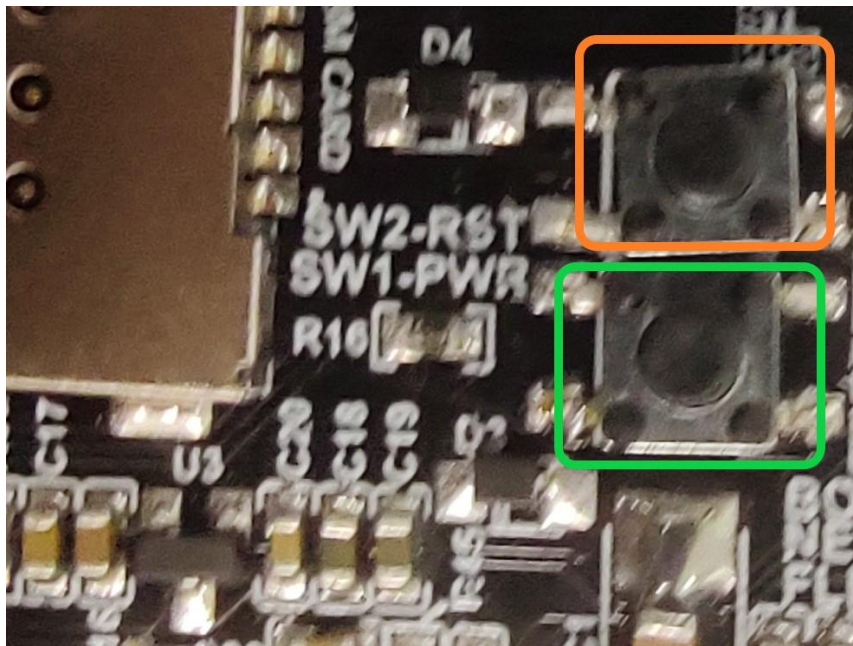


Figure 9 Power ON (Green) and RESET button (Orange)



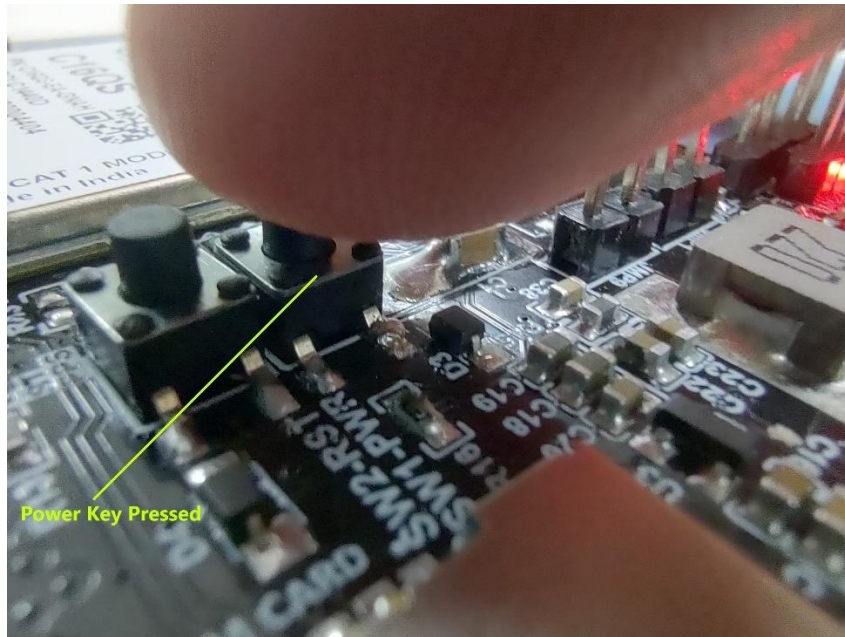


Figure 10 Pressing the Power Key

7. The Power ON LED for the module turns Green once the module starts to boot.
Once the RF functionality is enabled, i.e., AT+CFUN=1, the NETLIGHT will be ON (blinking-searching for network, stable-latched on to network).



Figure 11 Indication LEDs



8. The complete setup is shown below:

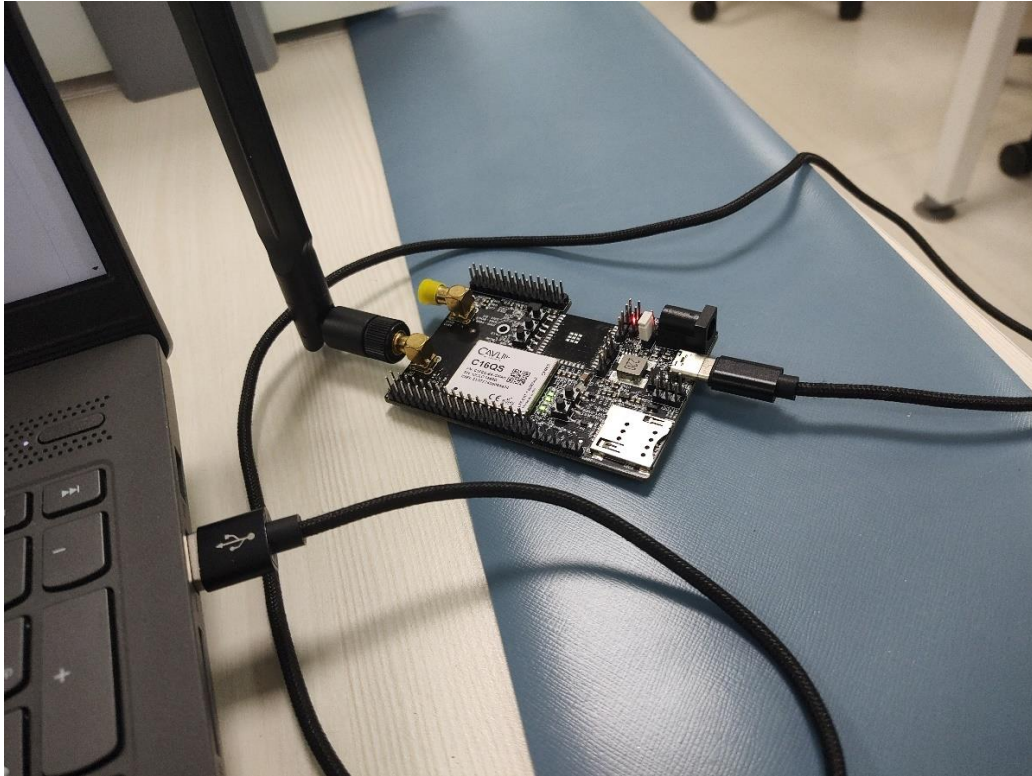


Figure 12 Complete Setup

9. Using Type-C USB, after complete module boot up, COM ports will be automatically be initialized onto your Windows PC (ttyUSB in Linux).

- 2xCOM for AT Port
- 1xCOM for DM Port

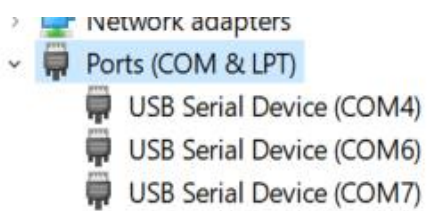


Figure 13 COM Ports



10. If RNDIS is enabled through the AT port, it will be listed under 'Network Adapters' in 'Device Manager' in Windows PC.

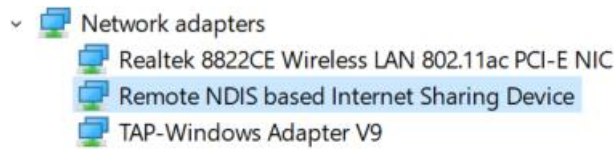


Figure 14 RNDIS

NOTE

- To access the COM/ttyUSB ports via the Type-C USB interface, the module must be fully booted up. Else the COM/ttyUSB ports would not be initialized.
- To access internet through RNDIS, the command **AT\$QCNETDEVCTL=3,1** has to be given to the module via the AT Port. Once done, you need not repeat this step again.
- To access the UART Ports directly through the pin-outs, you must you a TTL Converter.

