



Bravo Evaluation Board Quick Start Guide

1VV0301650 Rev. 3 – 2021-04-07

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APPLICABILITY TABLE

PRODUCTS

■ ■ BRAVO EVALUATION KIT

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1. INTRODUCTION

1.1. Scope

Scope of this document is to give a quick getting start guide for Bravo Evaluation Kit.

1.2. Audience

This document is intended for Telit Bravo Kit users.

1.3. Contact Information, Support

For general contact, technical support services, technical questions and report documentation errors contact Telit Technical Support at:

- TS-EMEA@telit.com
- TS-AMERICAS@telit.com
- TS-APAC@telit.com

Alternatively, use:

<http://www.telit.com/support>

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

<http://www.telit.com>

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.4. Text Conventions



Danger – This information **MUST** be followed or catastrophic equipment failure or bodily injury may occur.



Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.



Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.5. Related Documents

- Bravo EVK HW User Guide, 1VV0301646
- ME910C1 HW User Guide, 1VV0301351
- xE910 Global Form Factor Application Note, 80000NT10060A
- ME910 C1 Quick Start Guide, 80529NT11661A
- xE910 Global Form Factor Application Note, 80000NT10060A

2. UNPACKING AND PREPARING THE BRAVO BOARD

2.1. Bravo Board Content

This Quick Start guide will walk you through the steps required to setup and run the Bravo EVK Board.

Your Bravo kit contains the following:

- 1 Bravo EVK Board featuring Telit ME910C1-WW IoT OneEdge-enabled module
- 1 Micro-USB cable
- Berg connector kit

2.2. Strip Connectors Installation

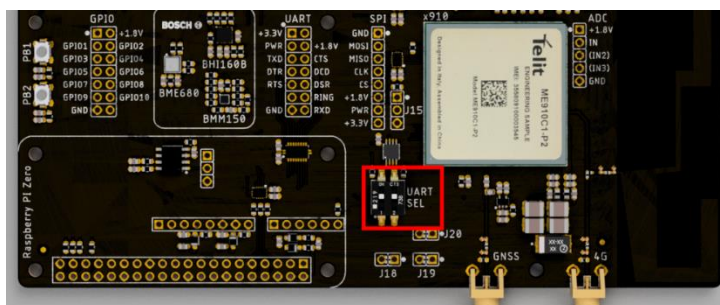
If the board is to be used with Arduino or Raspberry Pi platforms, strip (“Berg”) connectors (supplied) must be manually installed.



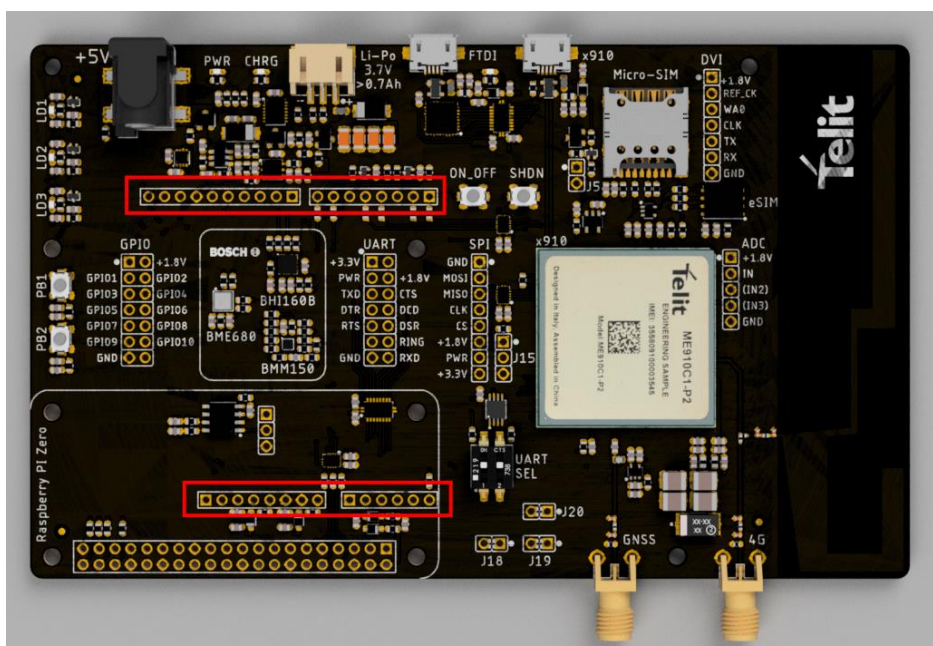
Please use a low-power, temperature-controlled soldering iron with a fine tip and high-quality soldering alloy.



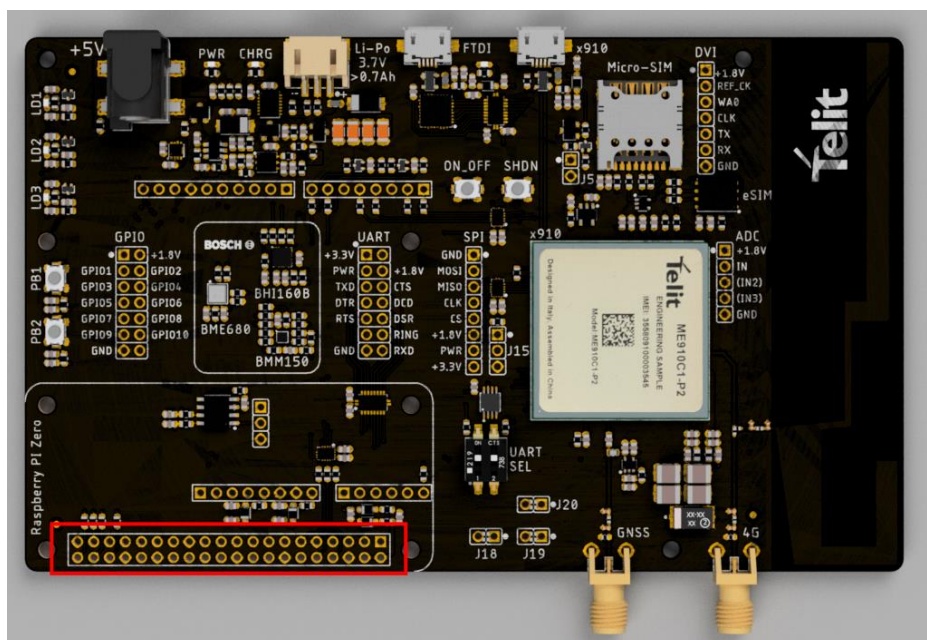
Arduino/Raspberry Pi can be connected with Bravo EVK Board Telit ME910C1 UART port. Please identify the **UART SEL** dip switches as they will be modified depending on the setup:



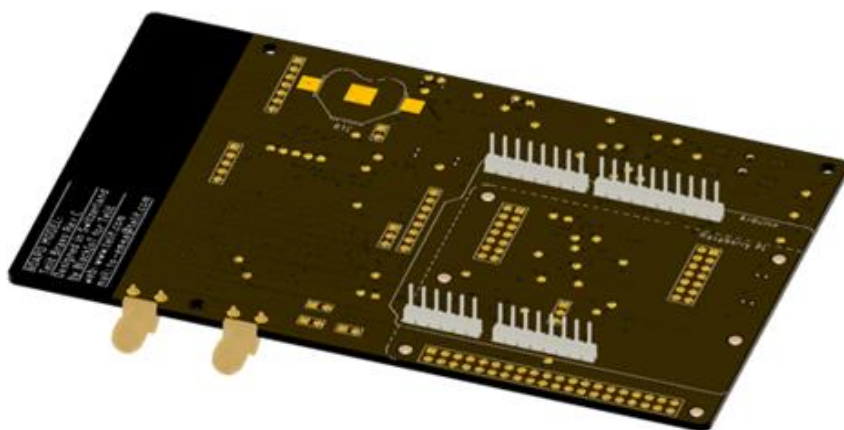
For Arduino Uno compatible connections, please solder Bergs in the highlighted headers referring to the picture below.



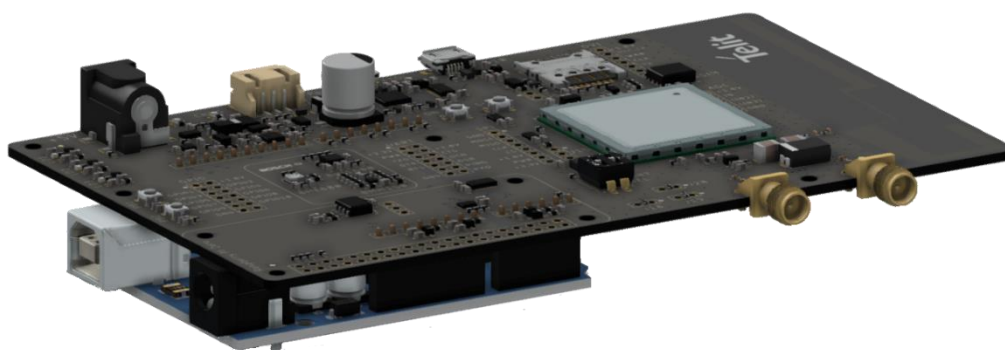
For Raspberry Pi boards, please solder Bergs referring to the highlighted header in the picture below.



- 1) For Arduino, male Berg connectors must be mounted on the bottom side of the board, as shown below:

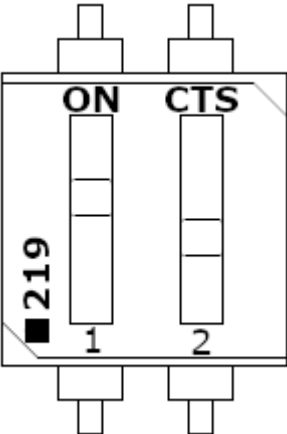


The picture below shows the relative mount of an Arduino Uno with the Bravo board





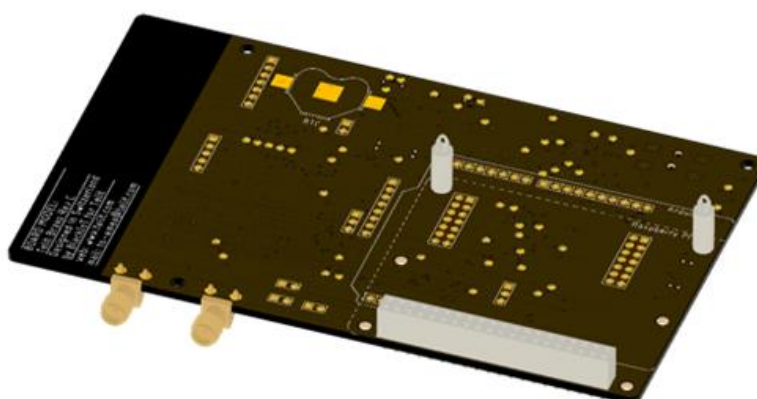
To make Arduino communicate with Bravo EVK Board module's UART, set UART SEL dip switches as shown below:

	SW1	SW2
	ON	OFF

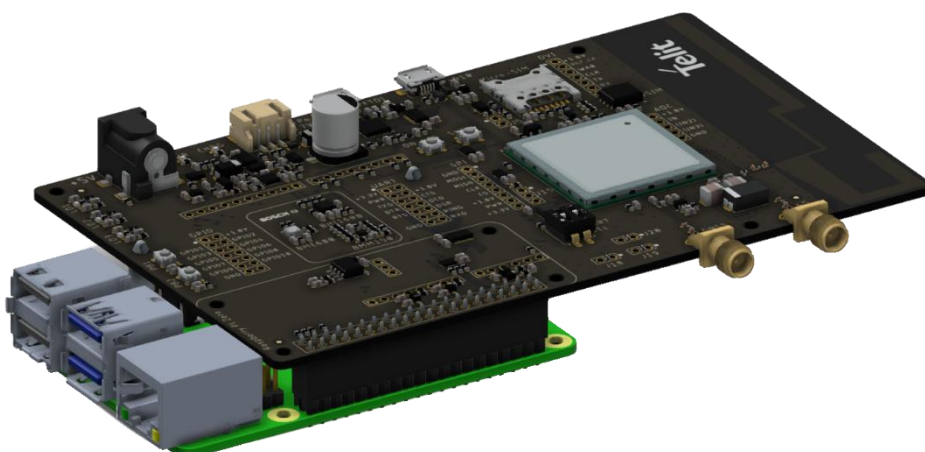


An Arduino Zero or equivalent board (with ARM Cortex M0+ processor) is needed to communicate with the Bravo Board, as a dedicated UART interface must be available. Arduino Uno is not suggested because it has a single UART interface and it is shared with the debug port. So developing and debugging will not be possible.

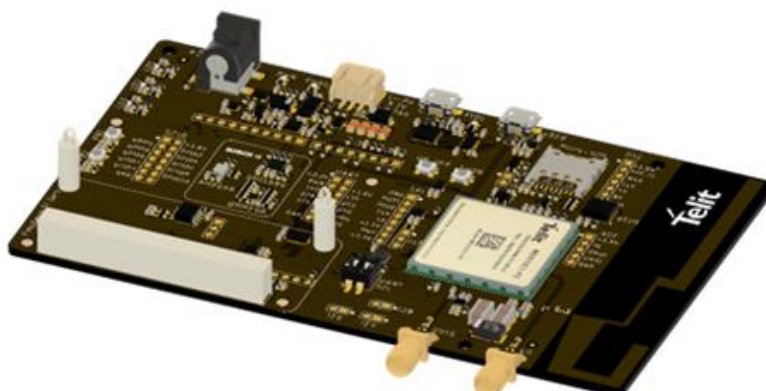
2) For Raspberry Pi, female Berg connectors must be installed as shown below.:



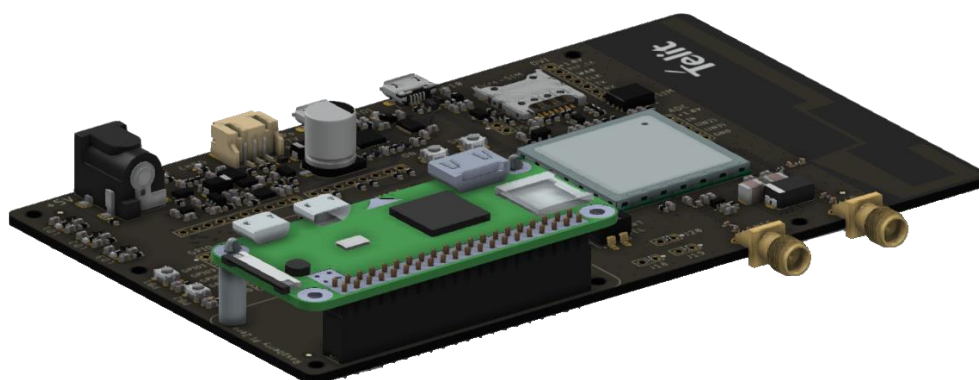
The final assembly is showed in the picture below:



- 3) For Raspberry Pi Zero, it is required to mount the female Berg connector on the top side.



This requires that the male Berg connector on the Raspberry Pi Zero must be soldered on its bottom: refer to the picture below

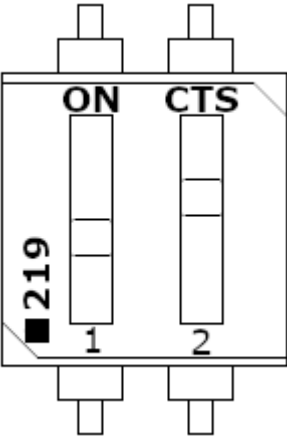




It is suggested to mount two 11mm teflon spacers between Bravo and the open hardware boards, such as (in example) Wurth PN 709 670 110

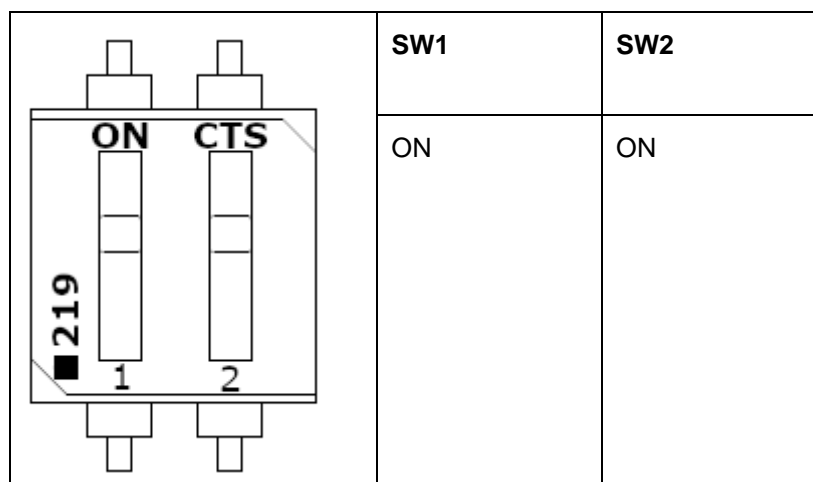


To make Raspberry Pi boards communicate with Bravo EVK Board module's UART, set UART SEL dip switches as shown below:

	SW1	SW2
	OFF	ON



Bravo EVK Board exports also all ME910C1-WW UART signals (full HW flow control available) on “UART” header. To use this connector, set UART SEL dip switches as shown below:



Important: The connector leverages a dedicated level shifting FTDI. To communicate with the ME910C1-WW UART, the external host's UART VCC must be connected to PWR pin (which will then provide the reference for that side of the translation).

2.3. PC USB Drivers Installation

Drivers are required to allow communication between your PC and the Telit module. Communication can take place either through the native USB port or the USB to serial converter (USB connector marked “FTDI”).

- The driver package for the FTDI serial to USB adapter can be downloaded from: <https://www.telit.com/bravo> selecting “**USB to Serial Drivers**”
- The Driver package for the ME910 USB port can be downloaded from <https://www.telit.com/bravo> selecting “**Windows 10 Drivers**”

Please follow the instructions provided by the PDF file contained in the .zip archive.

2.4. SIM Card

In order to allow the module to register and exchange data on a mobile network, insert a data-capable SIM card in the SIM holder on the Bravo board. The format supported is Micro-SIM.

Please make sure the subscription supports data traffic on LPWA (either Cat-M or NBIoT) or GSM/GPRS radio access technologies.



Before using the SIM card with Bravo, it is suggested to disable SIM PIN request on the SIM card itself. If PIN is enabled on the SIM card, please use the AT+CPIN command to check status or unblock SIM.

2.5. Power Supply

The board itself contains a 3.7V linear power supply and can be powered:

- Through the native USB port, using the supplied USB cable
 - By connecting an external 5V DC power supply to the coaxial connector marked “+5V”.
-



Powering the board through the USB port relies on the host device (eg PC or USB hub) capability to provide at least 500 mA.

It is highly recommended to use either an external DC power supply or a battery pack.

Please check carefully that the external power supply:

- Provides **5V DC** (while not exceeding 7V at most)
 - Can provide **at least 600 mA** continuously
 - By connecting a 3.7 V battery pack to the connector marked “Li-Po 3.7V”.
-



Please read carefully the battery pack and charging requirements described in the Bravo EVK HW Manual.

2.6. GNSS Antenna

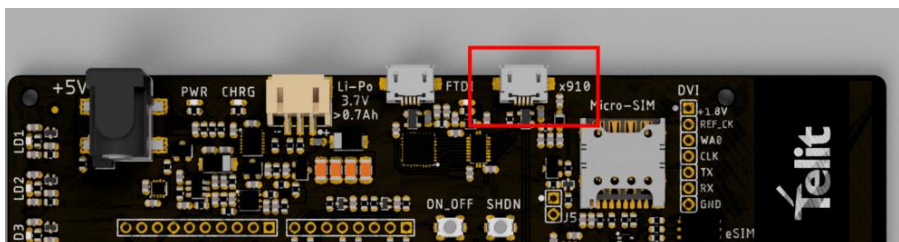
The Telit ME910C1-WW module embeds a high-performance GNSS receiver: its usage requires connecting a GNSS antenna (not supplied) to the SMA connector labeled “GNSS”.

3. CONNECTING THE BOARD TO A PC

Connecting Bravo to a PC is suggested to test board communication and familiarize with module AT commands.

3.1. USB connection between Bravo and PC

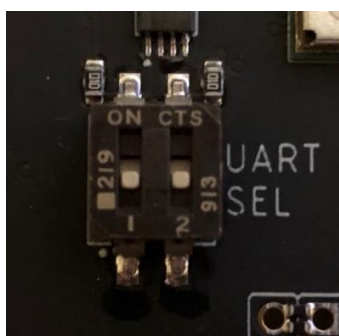
- Connect the micro-USB cable between the x910 port on the Bravo Board and the USB port of your PC or laptop.



Alternative: The board also provides access to the ME910 UART using an FTDI USB-to-serial converter. To enable it, identify the **UART SEL** dip switches:

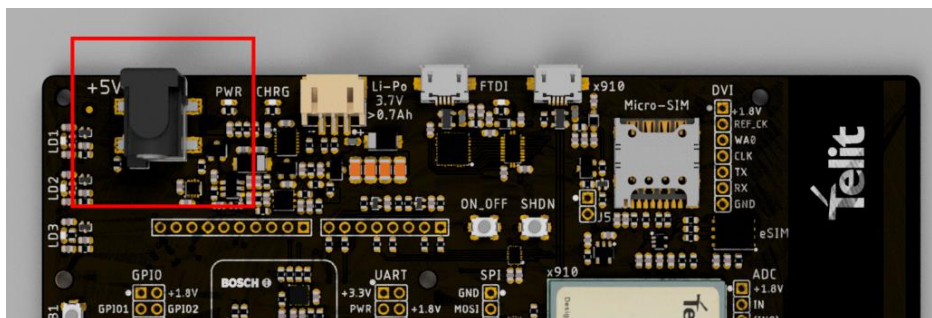
	SW1	SW2
	OFF	OFF

Please refer also to picture below:

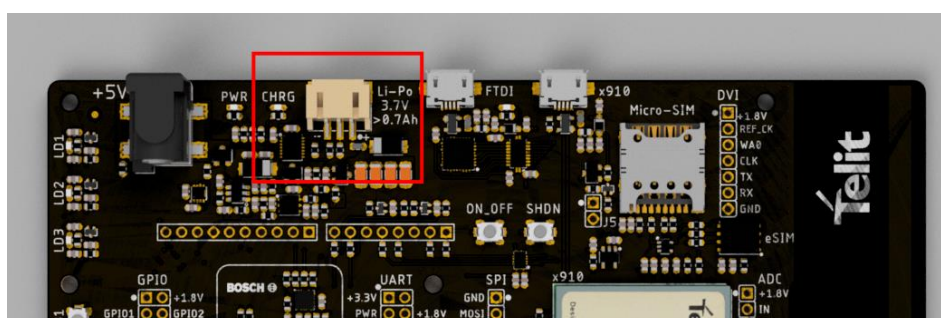


- Optional: supply the board with the preferred solution:

DC power supply barrel connector:



or **Battery connector:**

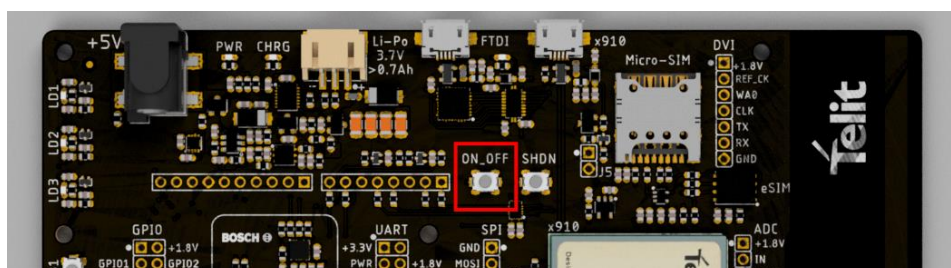


3.2. Switching On the Telit Module

After connecting the USB cable to the USB x910 port and optionally the power adapter to the power Jack or the battery to the Li-Po connector, the board is powered but the ME910 is still turned off.

After connecting the USB cable to the USB x910 port, new USB devices connected to the computer will not be visible.

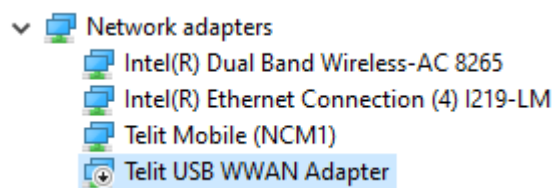
- To turn on the MCU keep the ON/OFF button pressed **for at least 5 seconds**. No led is switched on when the MCU is turned on.



When the MCU is powered on, three new USB devices will be visible within Windows Device Manager.

By default, both Windows and Linux detect the USB devices as a modem and lock the devices for communication tasks. To avoid this:

- In Windows, open “Device Manager” and expand Network Adapters group, then disable **Telit USB WWAN Adapter**. This must be done for every board.



An alternate procedure is to go to Control Panel ► Network and Sharing Center ► change Adapter settings ► right-click on Cellular connection and disable it.

- On Linux, configure ModemManager to exclude the devices from use as modems inserting the ID in ModemManager configuration files

3.3. Communication Ports

Two of the three USB devices can be used as terminals for sending AT commands to the MCU.

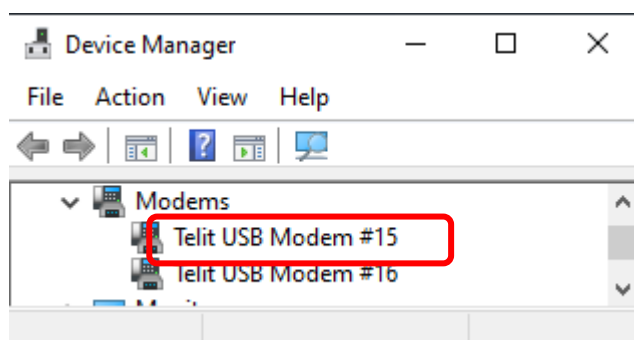
If connecting the USB cable to the FTDI USB port the board will be powered, but the Telit module will not turn on automatically.

On the computer, a new FTDI USB device will be mapped because the FTDI interface chip is powered by the USB port itself.

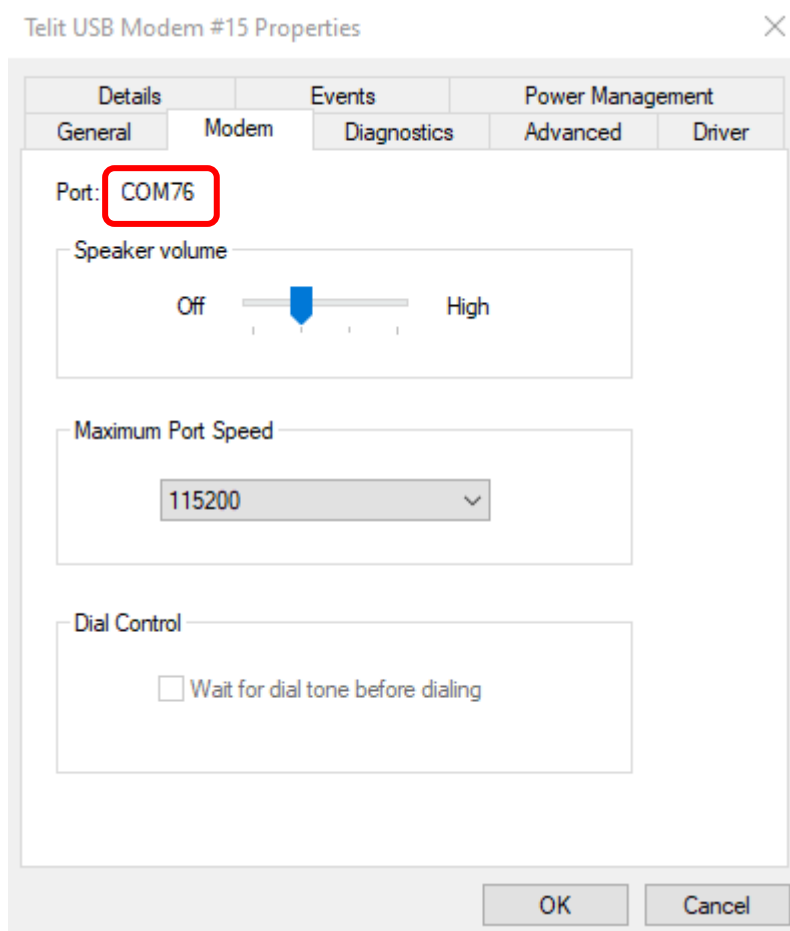
The FTDI USB connection will be able to receive AT commands once the MCU is switched on. To turn on the Telit module, follow the instructions above.

To use x910 USB COM ports:

- Go to **Control Panel > Device Manager** and check one of the USB Modems COM Port number.



- Right click on one of the two **Telit USB Modem** entries, select **Properties**, then **Modem** Tab.



To use FTDI ports, check “Ports (COM & LPT)” group: there will be a USB Serial Port (COM X) entry. This port will allow to communicate over the Main UART COM Port of ME910 MCU.

- ▼ Ports (COM & LPT)
 - com0com - serial port emulator (COM4)
 - com0com - serial port emulator (COM5)
 - Intel(R) Active Management Technology - SOL (COM3)
 - USB Serial Device (COM16)
 - USB Serial Device (COM17)
 - USB Serial Device (COM18)
 - USB Serial Device (COM19)
 - USB Serial Device (COM20)
 - USB Serial Port (COM10)
 - USB Serial Port (COM11)
 - USB Serial Port (COM12)
 - USB Serial Port (COM13)
 - USB Serial Port (COM14)
 - USB Serial Port (COM15)

3.4. Telit AT Controller Installation

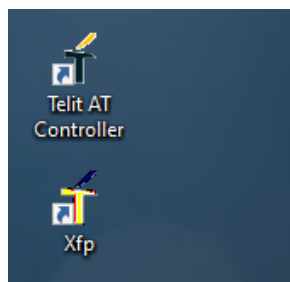
Telit AT controller is a terminal application designed to send AT commands to Telit IoT modules. It can be downloaded for free at the following address:

<https://www.telit.com/bravo> selecting “**Telit AT Controller**”

Unzip the folder and run **Setup_TATC_x.x.xx_XFP_x.x.x.msi** file.

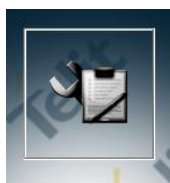
Upon successful installation, the following files will be created on your desktop:

- **Telit At Controller.Ink**
- **Xfp.Ink**



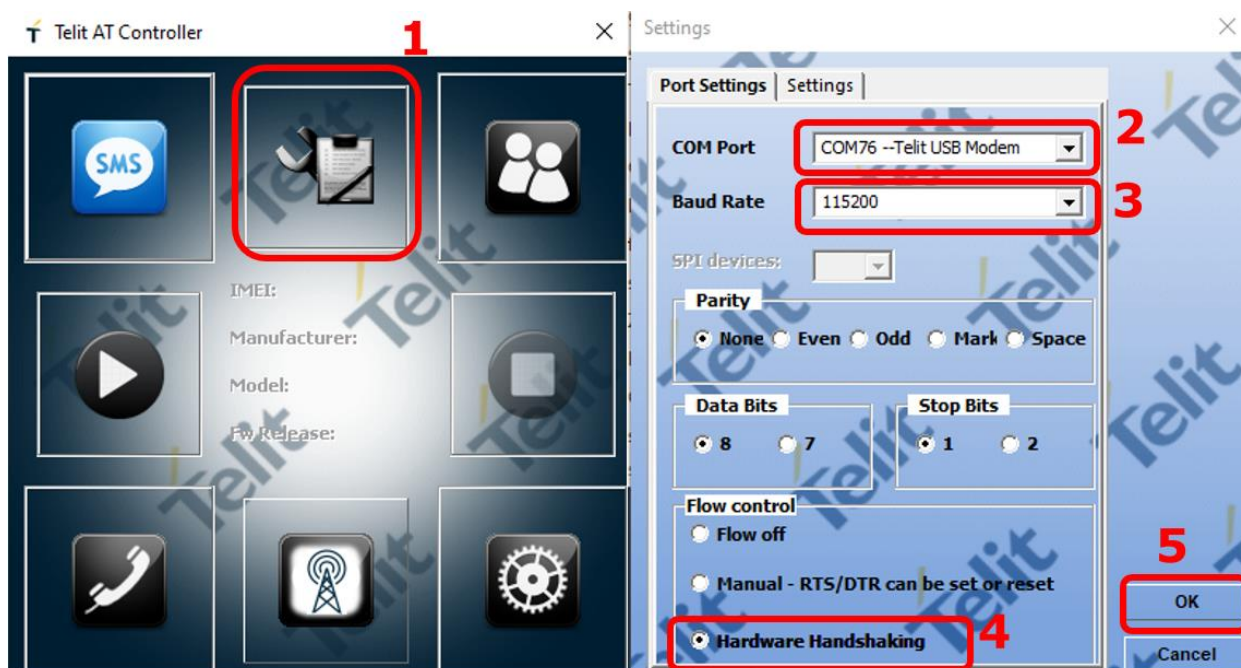
Double click on **Telit AT controller** icon to open the application.

Click the **Settings** Icon



Then **Port Settings** to setup the AT port parameters such as:

- COM port
- Baud rate
- Parity
- Data Bits
- Start Bits
- Flow Control, and click **OK**.



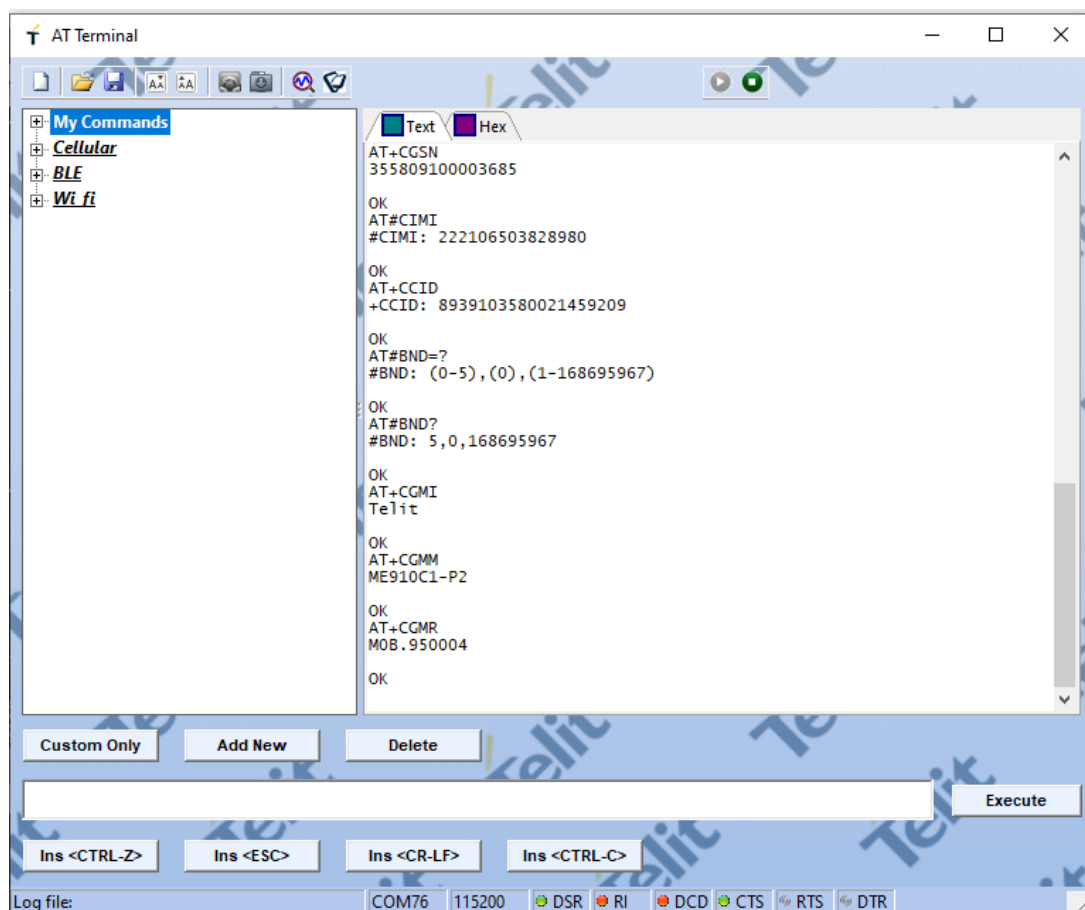
Upon configuration, click **Connect** button:



Module information such as IMEI, Manufacturer name, Model number and FW release version will be displayed:

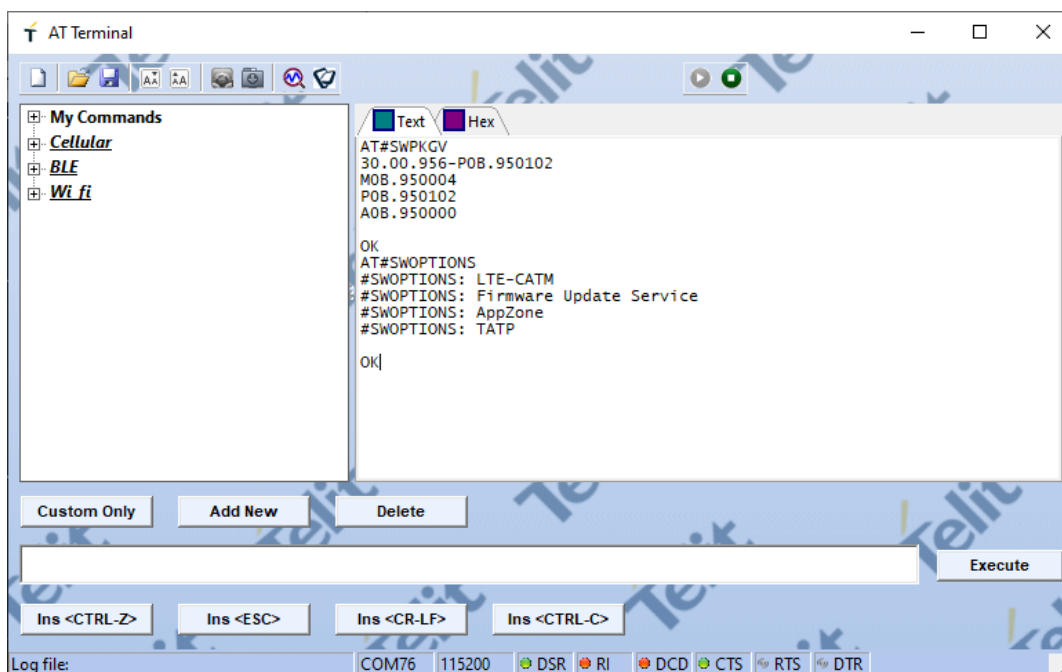


Click on **AT Terminal** to start the AT Terminal window:



Issue the following AT commands to verify firmware version and options

- **AT#SWPKGV**
- **AT#SWOPTIONS**



4. USE CASES

The following use cases are for example only and show command sequences. Each command is documented in the Telit ME910 AT Commands manual: users are encouraged to consult it for further details.

4.1. Module Registration, Data Connection to a Test Server

The following example shows a simple AT command sequence to perform the following actions:

- Check Module SIM and registration status
- Configure Module APN
- Activate PDP Context to start a data connection
- Connect to a test server and open a data socket
- Send data to a test server
- Close connection

Send the commands

- **AT+CPIN?**
- **AT+CREG?**
- **AT+CGREG?**

AT+CPIN? Check PIN status

+CPIN: READY

OK

AT+CREG? Check Circuit Switched Registration status

+CREG: 0,1

OK

AT+CGREG? Check Packet Switched Registration status

+CGREG: 0,1

OK

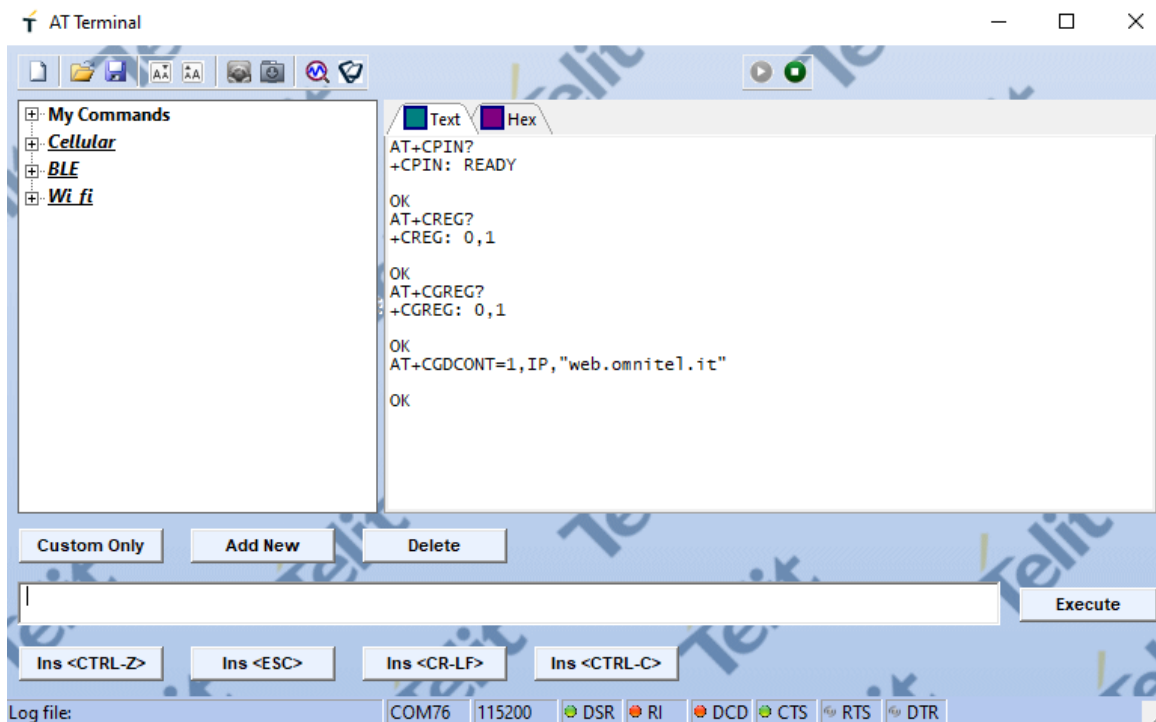
Configure the APN for the SIM card in use:

- **AT+CGDCONT=1,IP,"<YOUR_APN>"**

Please replace "<YOUR_APN>" with the APN to be used with your SIM card.



Please consult your Network provider to check the correct APN.
Some networks have different APNs depending on the contract, profile etc

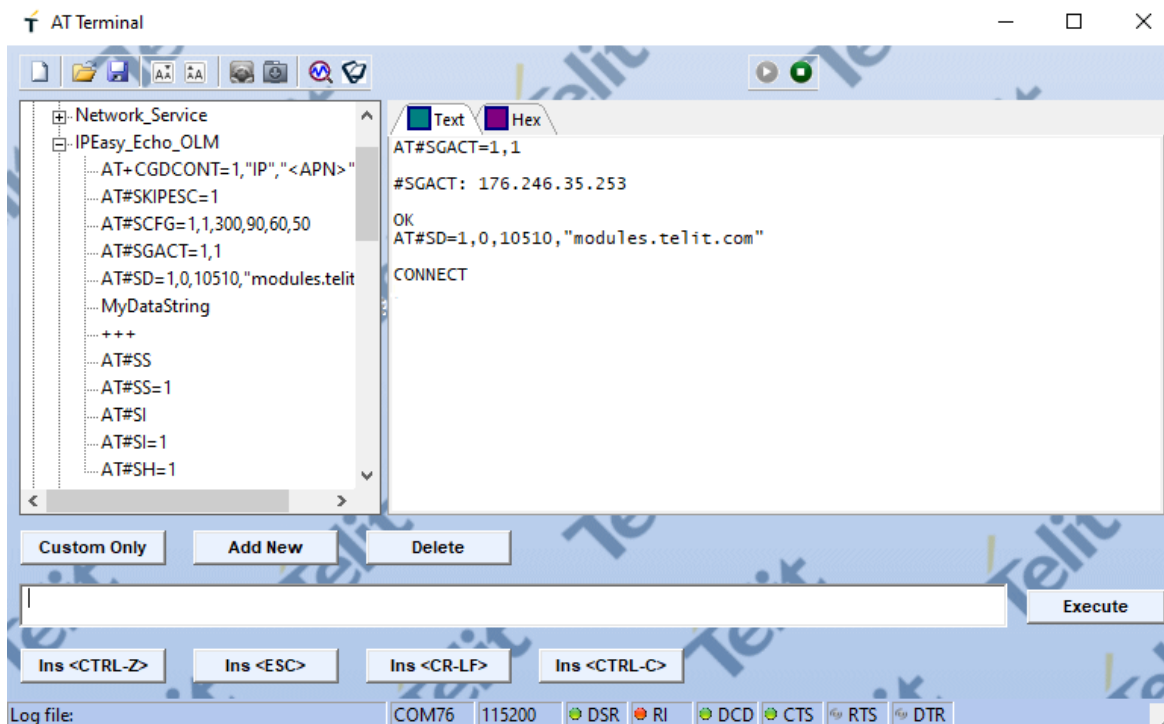


Activate the PDP context with:

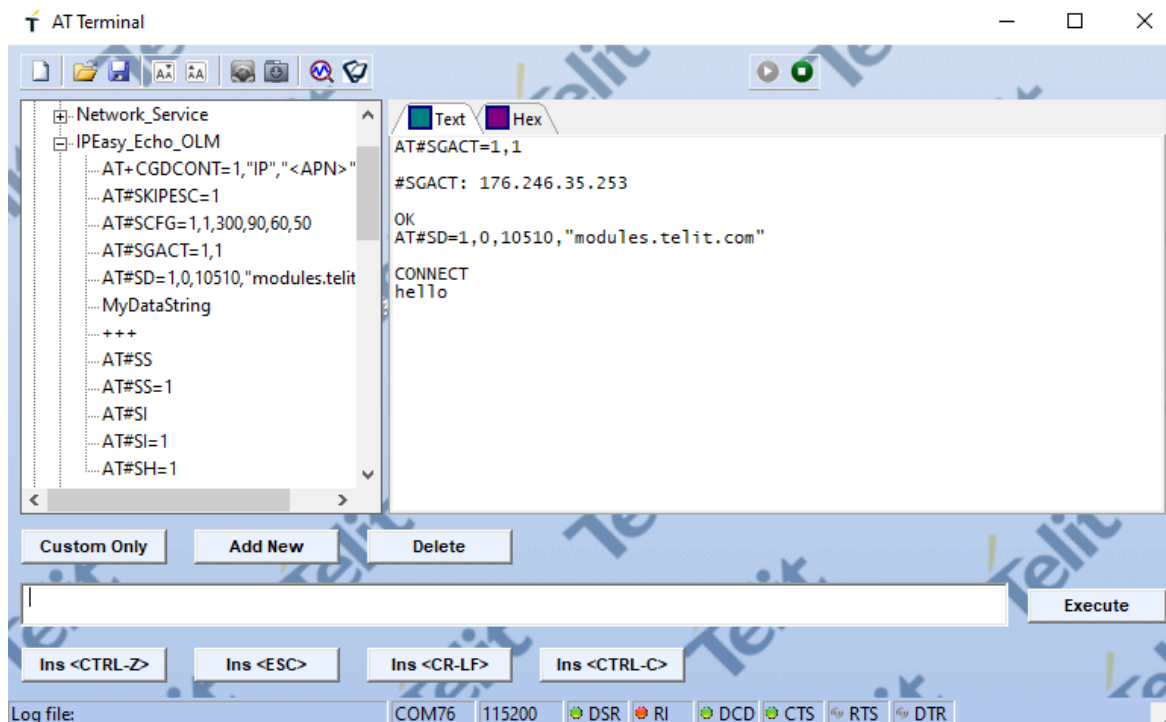
AT#SGACT=1,1

And connect to the server using the socket dial command (in ONLINE MODE)

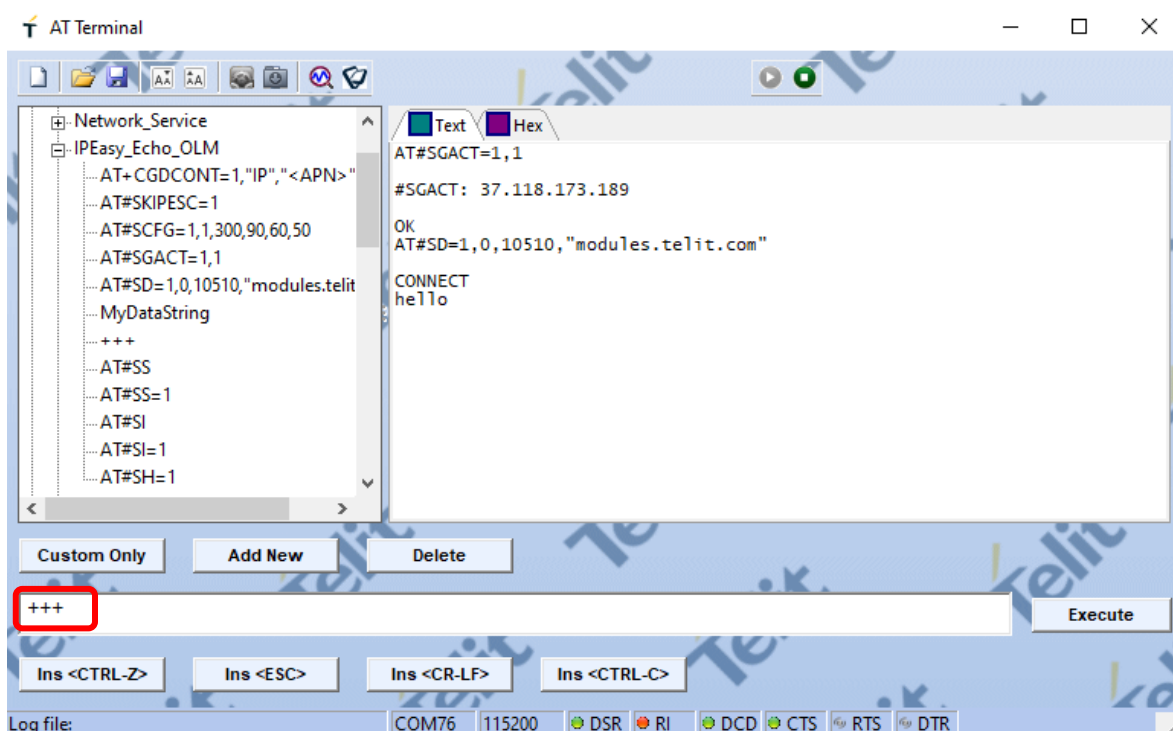
AT#SD=1,0,10510,\"modules.telit.com\"



Type **"hello"** (without quotes) in the input field and press Enter. The server will reply with an echo message:



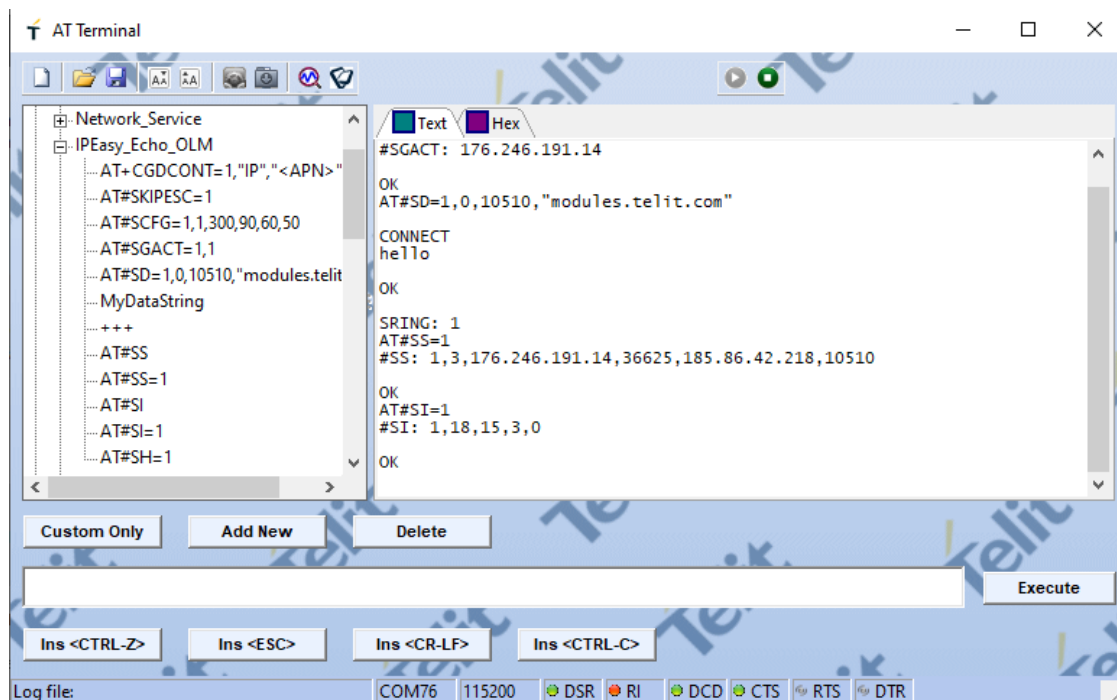
To exit ONLINE mode, type **+++** and press Enter:



Check socket status and exchanged data with

AT#SS=1

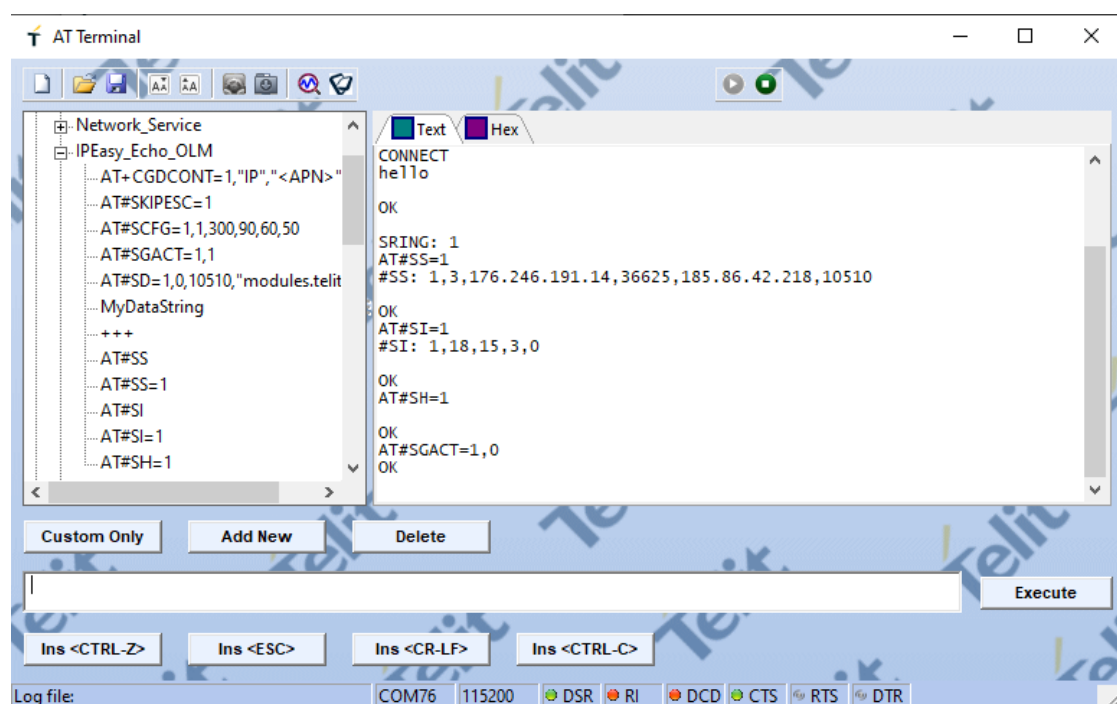
AT#SI=1



Close the socket and disable the PDP context with the following commands:

AT#SH=1

AT#SGACT=1,0



4.2. Switch on LED at Startup

It is advisable to automatically turn on at least one LED at MCU wakeup: this is useful as visible feedback to know whether the IOT Module is powered ON or OFF.

The BRAVO Board is equipped with 3 LEDs (connected to GPIO 1, 9 and 10) that can be enabled/disabled using the following AT commands:

To turn ON the leds:

- AT#GPIO=1,1,1
- AT#GPIO=9,1,1
- AT#GPIO=10,1,1

To turn OFF the leds:

- AT#GPIO=1,0,1
- AT#GPIO=9,0,1
- AT#GPIO=10,0,1

To turn the leds on permanently, so that they automatically turn on at module wakeup, please send the following command(s):

- AT#GPIO=1,1,1,1
- AT#GPIO=9,1,1,1
- AT#GPIO=10,1,1,1

4.3. Switching Off the Telit Module

To turn off the MCU you can either press the shutdown button or press the ON/OFF button for at least 5 seconds.

5. GLOSSARY AND ACRONYMS

	Description
TTSC	Telit Technical Support Centre
USB	Universal Serial Bus
HS	High Speed
DTE	Data Terminal Equipment
UMTS	Universal Mobile Telecommunication System
WCDMA	Wideband Code Division Multiple Access
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
UART	Universal Asynchronous Receiver Transmitter
HSIC	High Speed Inter Chip
SIM	Subscriber Identification Module
SPI	Serial Peripheral Interface
ADC	Analog – Digital Converter
DAC	Digital – Analog Converter
I/O	Input Output
GPIO	General Purpose Input Output
CMOS	Complementary Metal – Oxide Semiconductor
MOSI	Master Output – Slave Input
MISO	Master Input – Slave Output
CLK	Clock
MRDY	Master Ready
SRDY	Slave Ready
CS	Chip Select
RTC	Real Time Clock
PCB	Printed Circuit Board
ESR	Equivalent Series Resistance
VSWR	Voltage Standing Wave Ratio
VNA	Vector Network Analyzer

6. DOCUMENT HISTORY

Revision	Date	Changes
0	2020-03-18	Initial Revision
1	2020-10-02	Added Arduino and Raspberry Pi mount and usage details
2	2021-03-17	Correction in dip-switch description for Raspberry Pi and Arduino
3	2021-04-07	Hyperlinks corrected



SUPPORT INQUIRIES

Link to **www.telit.com** and contact our technical support team for any questions related to technical issues.

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Mod. 0809 2017-01 Rev.8