MultiConnect® microCell
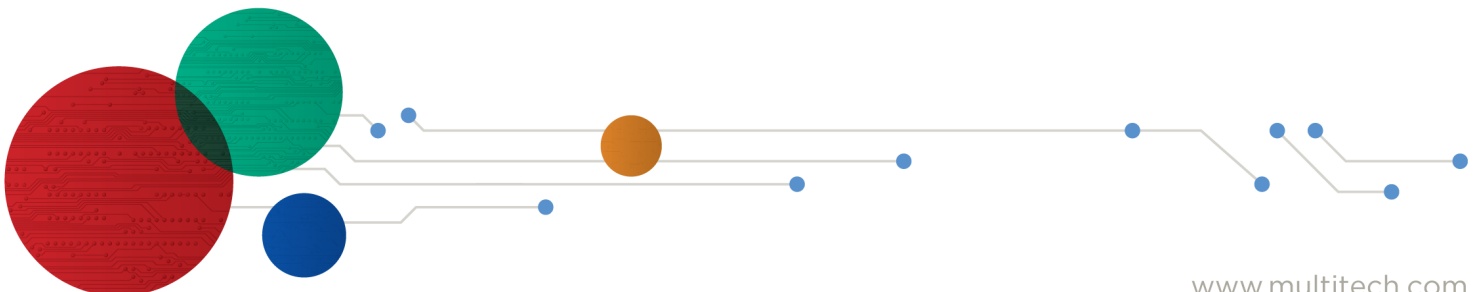
MTCM-L4N1D User Guide

MultiConnect microCell MTCM-L4N1D User Guide

Model: MTCM-L4N1D-B03

Part Number: S000822 Rev. 1.1

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Contents

Chapter 1 – Product Overview

Overview

The MultiConnect microCell is a compact and simple communications platform that provides cellular capabilities for fixed and mobile applications. It is intended for use in settings such as vending, smart parking, medical, smart inventory tracking equipment and commercial applications.

Build Options

Ordering Part Number	Description	Region
MTCM-L4N1D-B03	LTE Cat 4 USB Modem	Canada, United States
MTCM-L4N1D-B03-KIT	LTE Cat 4 USB Modem with Accessory Kit	Canada, United States

Additional Documentation

The following documents are available on the MultiConnect® microCell page. Select your model to find the documents specific for that device.

Document	Description	Part Number
Device Guide microCell MTCM-L4N1D	This document. Hardware, regulatory, and getting started information.	S000822
Quick Start Guide microCell MTCM-L4N1D	Steps for getting started. Ships with the device and is available online.	82104702L[*]
Telit LE910 AT Commands Reference Guide	For L4N1D devices, lists AT Commands and parameters used to communicate with your device.	80502ST10950A
USB Driver Installation Guide	Provides steps for installing USB drivers.	S000616
MultiTech Connection Manager	Software automation tool for management of cellular modem connectivity.	Software download: https://multitech.com/all-products/software-management/connection-manager/

[*] If an updated Quick Start is available, the part number may be incremented.

Chapter 2 – Mechanical Drawings

Dimensions
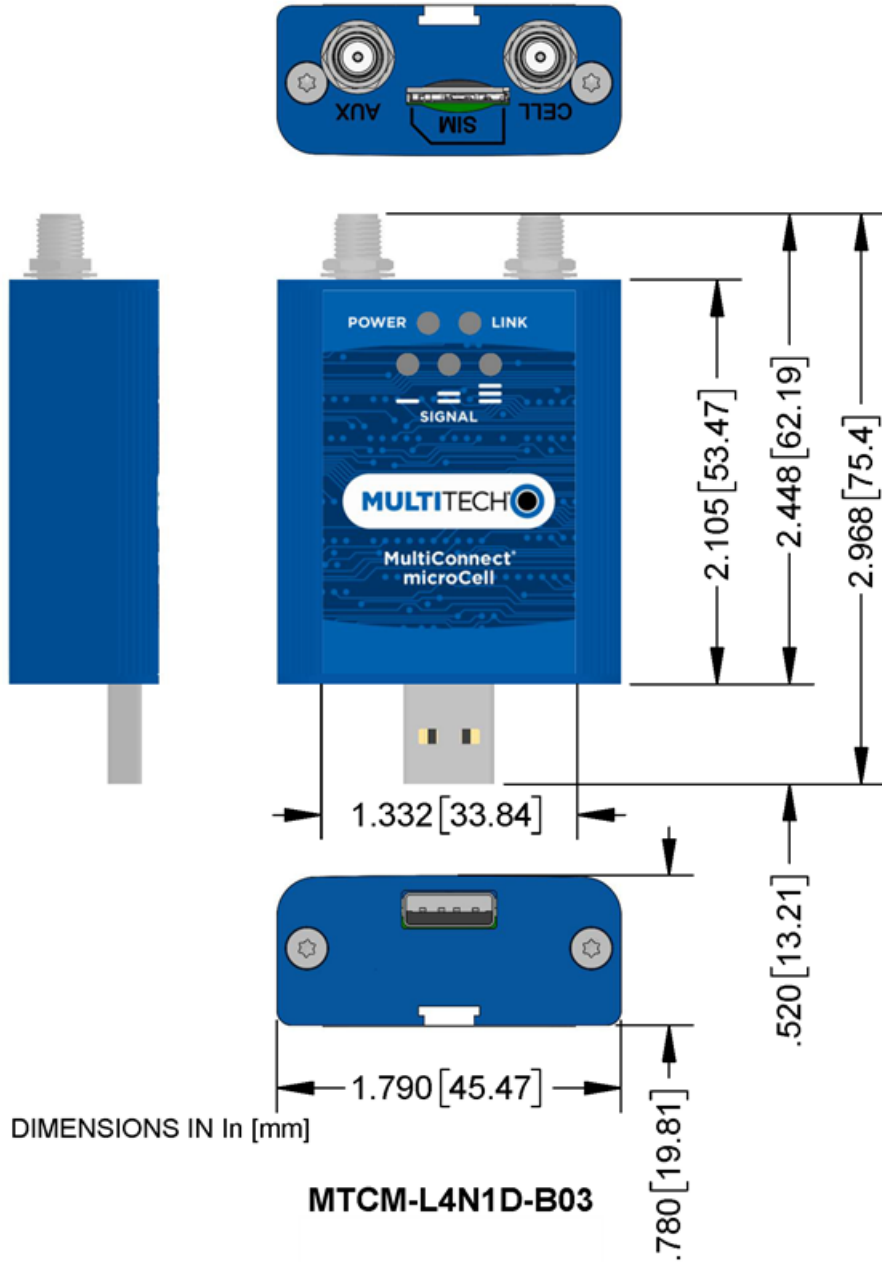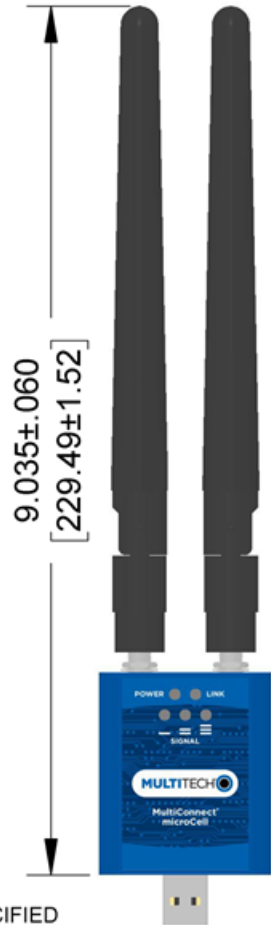
DIMENSIONS IN In [mm]

MTCM-L4N1D-B03

9.035±.060
[229.49±1.52]

DIMENSIONS IN In [mm]

TOLERANCE ±.020 [.50] UNLESS SPECIFIED

11.816±.060
[300.13±1.52]

3.897±.060
[98.99±1.52]
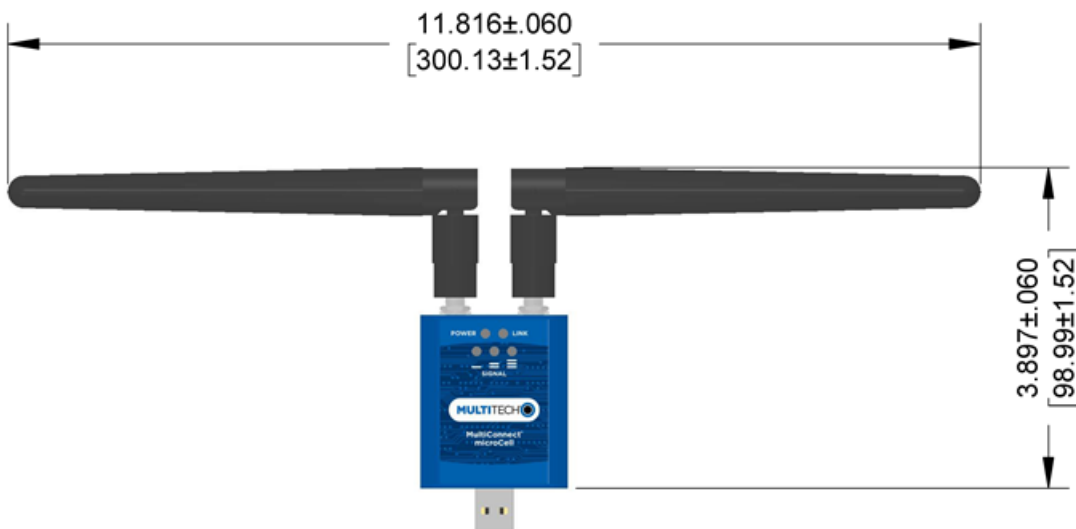
DIMENSIONS IN In [mm]
TOLERANCE ±.020 [.50] UNLESS SPECIFIED

Chapter 3 – Specifications

MTCM-L4N1D-B03 Specifications

Category	Description
General	
Standards	LTE 3GPP Release 9
	HSPA+ 21/GPRS fallback
	USB Interface is CDC-ACM compliant
TCP/IP Functions	FTP, SMTP, SSL, TCP, UDP
Frequency Bands	4G: B2, B4, B5,B12, B13, B14, B66, B71
	3G: B2, B4, B5
Speed	
Data Speed	LTE: 150 Mbps downlink/50 Mbps uplink
Interface	
USB Interface	USB 2.0 high speed 480 Mbps
Physical Description	
Weight	Device only: 2.1 oz. (60 g); With antennas: 2.7 oz. (77 g)
Dimensions	Refer to mechanical drawing for dimensions.
Connectors	
Antenna Connector	2 SMA connector for cellular
SIM	1.8V and 3V SIM holder for micro-SIM (3FF) card
Environment	
Operating Temperature	-40° C to +85° C
Storage Temperature	-40° C to +85° C
Humidity	20%-90% RH, non-condensing
Power Requirements	
Operating Voltage	USB Model: 5 VDC
SMS	
SMS	Point-to-Point messaging
	Mobile-Terminated SMS
	Mobile-Originated SMS

Category	Description
Certifications and Compliance	
EMC Compliance	FCC Part 15 Class B
Radio Compliance	FCC Part 22H, 24E, 27
Safety Compliance	UL 60950-1 2nd ED, UL 62368-1
	cUL 60950-1 2nd ED, cUL 62368-1
	IEC 60950-1 2nd ED, IEC 62368-1
Network Compliance	PTCRB
Carrier	AT&T, Verizon, T-Mobile

LED Descriptions

The top panel contains the following LEDs:

- Power LED—The Power LED indicates that DC power is present.
- Link LED—The Link LED indicated that it is registered on the network.
- Signal LEDs—Three signal LEDs can display the signal strength level of the wireless connection.

LED Indicators	
POWER	Indicates presence of DC power when lit.
LINK	Off : No power to unit. On: Continuously lit Powered on. Slow blink (-0.2Hz): Registered on network.
SIGNAL	These LEDs display the strength of the cellular signal. **Note:** The three PROGAMMABLE SIGNAL LEDs can be controlled as follows: - GPIO2: Controls the LED with a single bar above it. - GPIO3: Controls the LED with two bars above it. - GPIO4: Controls the LED with three bars above it. For more information on using GPIO to control the LEDs, refer to the AT Command Guide.

Power Measurements

Multi-Tech Systems, Inc. recommends incorporating a 10% buffer into your power source when determining product load.

MTCM-L4N1D-B03 Power Draw

Radio Protocol	Sleep Mode	Live Connection, Idle Current	Cellular Connection Idle, No Data	Average Current at Max Power[1]	TX Pulse Amplitude Current for Peak Current [2]	Total Inrush Charge [3]	Total Inrush Duration During Power Up
5 Volts							
WCDMA Band 2 1854 MHz	N/A	35 mA	37 mA	524 mA	606 mA	0.13mC	53.3 uS
LTE BAND 14 793 MHz	N/A	36 mA	32 mA	588 mA	688 mA	0.13 mC	53.3 uS

Note:

1. Maximum Power: The continuous current during maximum data rate with the radio transmitter at maximum power.
2. TX Pulse: The average peak current during a connection.
3. Inrush Charge: The total inrush charge at power on.

Chapter 4 – Antennas

Cellular Antenna

Cellular devices were approved with the following antenna:

Manufacturer:	Wieson
Model Number:	ARY118-0167-001-00

MultiTech ordering information:

Model	Quantity
ANLTE4V2-1HRA	1
ANLTE4V2-2HRA	2
ANLTE4V2-10HRA	10
ANLTE4V2-50HRA	50

Cellular Antenna Specifications

Category	Description
Frequency Range	617-960 MHz
	1447-2690 MHz
	3300-3800 MHz
Impedance	50 Ohms
VSWR	619-960 MHz: 2.5:1
	1447-2690 MHz: 2:1
	3300-3800 MHz: 2:1
Peak Gain	619-960 MHz: 1.89 dBi
	1447-2690 MHz: 3.95 dBi
	3300-3800 MHz: 1.56 dBi
Radiation	Omni-directional
Polarization	Linear
Connector	SMA(M)

Antenna System Cellular Devices

The cellular/wireless performance depends on the implementation and antenna design. The integration of the antenna system into the product is a critical part of the design process; therefore, it is essential to consider it early so the performance is not compromised. Devices were approved with the following antenna(s) and for alternate antennas meeting the given specifications.

Notice regarding Compliance with FCC, EU, and Industry Canada Requirements for RF Exposure

The antenna intended for use with this unit meets the requirements for mobile operating configurations and for fixed mounted operations, as defined in 2.1091 of the FCC rules for satisfying RF exposure compliance. This device also meets the European RF exposure requirements of EN 62311. If an alternate antenna is used, consult user documentation for required antenna specifications.

Compliance of the device with the FCC, EU and IC rules regarding RF Exposure was established and is given with the maximum antenna gain as specified above for a minimum distance of 20 cm between the devices radiating structures (the antenna) and the body of users. Qualification for distances closer than 20 cm (portable operation) would require re-certification.

Wireless devices could generate radiation. Other nearby electronic devices, like microwave ovens, may also generate additional radiation to the user causing a higher level of RF exposure.

Chapter 5 – Carrier Specific Notice

Firmware Over the Air (FOTA)

Verizon Requirement: Firmware Over The Air (FOTA)

Also known as Firmware Update Over the Air (FUOTA). At times, your device may require a critical update to radio firmware for devices connecting to the network. To stay compliant to Verizon's requirements you must implement FOTA. Failure to perform a critical update could result in losing access to the Verizon network. For information and examples go to https://multitech.com/verizon-firmware-over-the-air-fota.

Chapter 6 – Safety Information

Radio Frequency (RF) Safety

Due to the possibility of radio frequency (RF) interference, it is important that you follow any special regulations regarding the use of radio equipment. Follow the safety advice given below.

- Operating your device close to other electronic equipment may cause interference if the equipment is inadequately protected. Observe any warning signs and manufacturers' recommendations.
- Different industries and businesses restrict the use of cellular devices. Respect restrictions on the use of radio equipment in fuel depots, chemical plants, or where blasting operations are in process. Follow restrictions for any environment where you operate the device.
- Do not place the antenna outdoors.
- Switch OFF your wireless device when in an aircraft. Using portable electronic devices in an aircraft may endanger aircraft operation, disrupt the cellular network, and is illegal. Failing to observe this restriction may lead to suspension or denial of cellular services to the offender, legal action, or both.
- Switch OFF your wireless device when around gasoline or diesel-fuel pumps and before filling your vehicle with fuel.
- Switch OFF your wireless device in hospitals and any other place where medical equipment may be in use.

Interference with Pacemakers and Other Medical Devices

Potential interference

Radio frequency energy (RF) from cellular devices can interact with some electronic devices. This is electromagnetic interference (EMI). The FDA helped develop a detailed test method to measure EMI of implanted cardiac pacemakers and defibrillators from cellular devices. This test method is part of the Association for the Advancement of Medical Instrumentation (AAMI) standard. This standard allows manufacturers to ensure that cardiac pacemakers and defibrillators are safe from cellular device EMI.

The FDA continues to monitor cellular devices for interactions with other medical devices. If harmful interference occurs, the FDA will assess the interference and work to resolve the problem.

Precautions for pacemaker wearers

If EMI occurs, it could affect a pacemaker in one of three ways:

- Stop the pacemaker from delivering the stimulating pulses that regulate the heart's rhythm.
- Cause the pacemaker to deliver the pulses irregularly.
- Cause the pacemaker to ignore the heart's own rhythm and deliver pulses at a fixed rate.

Based on current research, cellular devices do not pose a significant health problem for most pacemaker wearers. However, people with pacemakers may want to take simple precautions to be sure that their device doesn't cause a problem.

- Keep the device on the opposite side of the body from the pacemaker to add extra distance between the pacemaker and the device.
- Avoid placing a turned-on device next to the pacemaker (for example, don't carry the device in a shirt or jacket pocket directly over the pacemaker).

Chapter 7 – Regulatory Information

Industry Canada Class B Notice

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Reglement Canadien sur le matériel brouilleur.

This device complies with Industry Canada license-exempt RSS standard(s). The operation is permitted for the following two conditions:

1. the device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

47 CFR Part 15 Regulation Class B Devices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Chapter 8 – Environmental Notices

Compliance for Hazardous Substances (ROHS3)

Multi-Tech Systems, Inc. confirms that all products comply with the chemical concentration limitations set forth for ROHS3 for the regulations for CE and UKCA. Following the standard - EN IEC 63000:2018.

For the current Certificate of Compliance for Hazardous Substances and additional regulatory documents, visit: https://multitech.com/product-support/.

Chapter 9 – Device Installation

Installing a SIM Card

This model requires a SIM card, which is supplied by your service provider. To install the SIM card:

1. Locate the SIM card slot on the side of the modem. The slot is labeled SIM.
2. Slide the SIM card into the SIM card slot with the contact side facing up as shown. When the SIM card is installed, it locks into place.
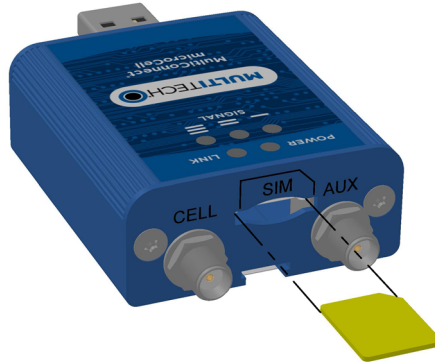
Removing a SIM Card

To remove the SIM card, push the SIM card in. The device ejects the SIM card.

Installing the Device

Important: Install drivers on your computer before connecting the device.
Important: Install both antennas for diversity.

1. Screw both antennas finger tight on to the SMA connectors, labeled CELL and AUX
2. Angle antennas away from each other. Do not angle antennas parallel each other.

3. Connect the USB connector to your computer or other USB high power device, such as a hub.
4. The POWER LED lights after the device powers up.

Powering Down Your Device

CAUTION: Failing to properly power down the device before removing power may corrupt your device's file system.

To properly power down your device, use the following sequence:

1. Issue the AT#SHDN command.
2. Wait 30 seconds.
3. Power off or disconnect power.

Note: If you send AT#SHDN and do not remove power, the control chip on the device turns the radio back on after the module resets or reboots.

Mounting Device to Flat Surface

1. Locate the groove on the bottom of the device.
2. Slide the mounting bracket through the groove.
3. To secure the bracket to the desired surface, place and tighten two screws in the holes on either end of the mounting bracket. The dimensions illustration in this guide shows the mounting bracket, as well as the dimensions for placement of the screws.

Chapter 10 – Device Configuration

Before Using the Device

Before using the device:

- Install any drivers. Refer to the separate driver installation guide for your device.
- On your computer, install terminal software that can communicate with the device, such as HyperTerminal, Tera Term, Kermit, or Putty.
- Power up your device and ensure it is connected to your computer that issues AT commands.

  Note: Wait 10 seconds after power-up before issuing any AT commands.

For additional information, refer to the AT command guide and any related documentation for your device. The AT command guide describes command formatting, syntax, and other basic information.

Using Command Mode and Online Data Mode

Modems have two operation modes, command and online data. After power up, the modem is in command mode and ready to accept AT commands.

Use AT commands to communicate with and configure your modem. These commands establish, read, and modify device parameters and control how the modem works. The device also generates responses to AT commands that help determine the modem's current state.

If the modem is in online data mode, it only accepts the Escape command (+++).

To send the modem AT Commands from terminal emulation software, set the software to match the modem's default data format, which is:

- Speed: 115,200 bps
- Data bits: 8
- Parity: none
- Stop bit: 1
- Flow control: hardware

To confirm communication with the device:

- Type **AT** and press **Enter**.

If the device responds with OK, it is properly communicating.

Device Phone Number

Every device has a unique phone number. Your cellular service provider supplies a phone number when you activate your account, or if your device has a SIM card, the phone number may be on it. Wireless service provider implementation may vary. Consult with your cellular service provider to get the phone number for your device.

Multi Carrier Firmware for Cellular Radio

This device uses a cellular radio with multi carrier firmware meaning that it can be used on different carrier networks (not simultaneously). The cellular module in device supports use on AT&T/other, Verizon, T-Mobile, Bell, and TELUS Networks.

Note: Device has been approved for use on AT&T, Verizon, and T-Mobile networks.

To verify your device is configured for the desired network:

```
AT#FWSWITCH?
```

If response is:

```
#FWSWITCH: 0
```
AT&T/other networks

```
#FWSWITCH: 1
```
Verizon

```
#FWSWITCH: 2
```
T-Mobile

```
#FWSWITCH: 3
```
Bell

```
#FWSWITCH: 4
```
TELUS

To switch carrier networks:

From AT&T to Verizon:

```
AT#FWSWITCH=1,1,1
```

From Verizon to AT&T:

```
AT#FWSWITCH=0,1,1
```

Note: Switching profiles reboots the system.

Important: For the Link status (LS) LED to function, you must issue the command AT#GPIO=1,0,2 any time you use the firmware switch command (AT#FWSWITCH=0 or AT#FWSWITCH=1).

Adding APN value

After properly setting up your account with your carrier and activating and installing your SIM card, you need to add your carrier's APN (Access Point Name) into the device before the cellular modem is ready for use.

To add your APN value:

1. Establish a terminal session with the device. If Verizon is your carrier, configure the device for the Verizon network as described in the previous topic.
2. If you are not on the Verizon network, program your network provider's Access Point Name (APN) into the device. To do this, issue:
   ```
   AT+CGDCONT=1,"IPV4V6","APN_Name"
   ```

(where APN_Name is the APN provided by your wireless carrier).
- Your wireless carrier assigns the APN. If you don't know the APN, contact your wireless carrier.

Your device should now be activated on the carrier's network and ready for use. To check operation issue the command: AT+CEREG? The modem should respond with +CEREG: 0,1 showing registration.

Verifying Signal Strength

To verify the device signal strength, enter:

AT+CSQ

The command indicates signal quality, in the form:

+CSQ: <rssi>,<sq>

Where:

<rssi>	Received signal strength indication.
0	(-113) dBm or less
1	(-111) dBm
2-30	(-109) dBm - (-53) dBm / 2 dBm per step
31	(-51) dBm or greater
99	Not known or not detectable
<sq>	LTE - RSRQ (in dBm):
0	-4 to -3
1	-6 to -5
2	-8 to -7
3	-10 to -9
4	-13 to -11
5	-15 to -14
6	-17 to -16
7	-19 to -18
99	Not known or not detectable

Note: Signal strength of 10 or higher is needed for successful packet data sessions.

Example

A example response to AT+CSQ:

```
+CSQ: 15,1
```

Checking Network Registration

Before establishing a packet data connection, verify the is device registered on the network. To do this enter the network registration report read command:

```
AT+CEREG?
```

If the device returns:

```
+CEREG: 0,1
```

or

```
+CEREG: 0,5
```

The device is registered.

If the device returns:

```
+CEREG: 0,2
```

The device is in a network searching state.

If the device returns:

```
+CEREG: 0,3
```

The registration is denied.

If the device returns:

```
+CEREG: 0,0
```

The device is not currently attempting to register to a network.

Sending and Receiving Data

Connecting Device to TCP Server as TCP Client

To send data through a connect socket:

1. **Bring up Data Connection Using Internal IP stack**
   Enter:
   Verizon:
   ```
   AT#SGACT=3,1
   ```
   Other Networks:
   ```
   AT#SGACT=1,1
   ```
   The device responds with the IP Address the cellular provider assigned to the device on connection, followed by OK. For example:
   ```
   #SGACT: 25.194.185.116
   OK
   ```
2. **Create Client Connection to TCP Server on Port 500**

Enter:

```
AT#SD=1,0,500,"###.##.###.##"
```
where ###.##.###.## is the TCP server IP Address.

The device responds with OK. The device can send or receive data now without entering additional commands.

Closing the Socket and the Connection

To close the socket:

1. Enter the escape sequence:
   ```
   +++
   ```
2. To close Socket 1, enter:
   ```
   AT#SH=1
   ```

To close the data connection:

Enter:

Verizon:

```
AT#SGACT=3,0
```

Other Networks:

```
AT#SGACT=1,0
```

The device responds with OK.

Configuring Device as UDP Listener to Accept UDP Client Connections

To configure the device as a UDP client:

1. **Check signal strength.**
   Enter:
   ```
   AT+CSQ
   ```
2. **Verify device is registered on the cellular network.**
   Enter:
   ```
   AT+CEREG?
   ```
   Should return:
   ```
   +CEREG: 0,1 or +CEREG: 0,5
   OK
   ```
3. **Configure socket parameters**
   Enter:
   ```
   AT#SCFG=1,3,300,240,600,50
   ```
4. **Activate context one**
   Enter:
   Verizon:
   ```
   AT#SGACT=3,1
   ```
   Other Networks:

```
AT#SGACT=1,1
```

5. **Set firewall rule to accept connections:**

```
AT#FRWL=1,"###.##.###.#","###.##.###.#"
```
where ###.##.###.# represents the IP range. For example:

```
AT#FRWL=1,"204.26.122.1","204.26.122.255"
```

6. **Set connection ID 1 for UDP listening mode on port 7000.**

   Enter:

   AT#SLUDP=1,1,7000

   The device responds with and unsolicited indication that a host is trying to connect to connection ID 1 on port 7000.

   ```
   SRING: 1
   ```

7. **Accept incoming connection ID 1**

   Enter:

   AT#SA=1

   The device indicates a client successfully established a listener connection.

   ```
   CONNECT
   ```
   The device can send and receive data now.

Exit Data Mode and Close Connection

To exit data mode and close the socket:

1. Enter the escape sequence:
   ```
   +++
   ```
2. To close Socket 1, enter:
   ```
   AT#SH=1
   ```
3. To close the data connection, enter:

   Verizon:
   ```
   AT#SGACT=3,0
   ```
   Other Networks:
   ```
   AT#SGACT=1,0
   ```
   The device responds with OK.

Configuring Device as UDP Client to Connect to UDP Server

Configure and Connect the Device

To configure the device as a UDP client:

1. **Check signal strength.**

   Enter:

   ```
   AT+CSQ
   ```

2. **Verify device is registered on the cellular network.**

   Enter:

   ```
   AT+CEREG?
   ```
   Should return:
   ```
   +CEREG: 0,1 or +CEREG: 0,5
   ```

```
OK
```

3. **Configure socket parameters**

Enter:

```
AT#SCFG=1,3,300,240,600,50
```

4. **Activate context one**

Enter:

Verizon:
```
AT#SGACT=3,1
```
Other Networks:
```
AT#SGACT=1,1
```

5. **Create UDP connection to Server port**

Enter:

```
AT#SD=1,1,####,"###.##.###.##"
```
where #### is the server port and ###.##.###.## is the IP number.

The device responds with OK, which indicates a successful connection for sending and receiving data through the socket connection.

Exit Data Mode and Close Connection

To exit data mode and close the socket:

1. Enter the escape sequence:
```
+++
```
2. To close Socket 1, enter:
```
AT#SH=1
```
3. To close the data connection,enter:

Verizon:
```
AT#SGACT=3,0
```
Other Networks:
```
AT#SGACT=1,0
```
The device responds with OK.

Transferring FTP File to FTP Server

To connect to FTP server and upload files:

1. **Check signal strength.**

Enter:

```
AT+CSQ
```

2. **Verify device is registered on the cellular network.**

Enter:

```
AT+CEREG?
```
Should return:

```
+CEREG: 0,1 or +CEREG: 0,5
```

```
OK
```

3. **Activate context**

Enter:

Verizon:

`AT#SGACT=3,1`

Other Networks:

`AT#SGACT=1,1`

4. **Set FTP operations timeout to 10 seconds**

Enter:

`AT#FTPTO=100`

5. **Configure FTP server IP address with username and password.**

Enter:

`AT#FTPOPEN="###.##.###.#","username","password",0`
where ###.##.###.# is the IP address and the username and password for the FTP server.

6. **Configure file transfer type.**

Enter:

`AT#FTPTYPE=#`
where # is 0 for binary or 1 for ASCII.

7. **Enter the file name to be sent to the FTP server and initiate connection.**

Enter:

`AT#FTPPUT="file.txt"`
The device responds with:

`CONNECT`

8. **Send the file through the device.**

Closing the FTP Data Connection

After the file is sent:

1. **Enter the escape sequence.**

Enter:

`+++`
The device responds with:

`NO CARRIER`

2. **Close the FTP connection.**

Enter:

`AT#FTPCLOSE`

3. **Close the PPP data connection.**

Enter:

Verizon:

`AT#SGACT=3,0`

Other Networks:

`AT#SGACT=1,0`

The device responds with OK.

Downloading File from FTP Server

To connect to an FTP server and download files:

1. **Check signal strength.**

    Enter:

    `AT+CSQ`

2. **Verify device is registered on the cellular network.**

    Enter:

    `AT+CEREG?`

    Should return:

    `+CEREG: 0,1 or +CEREG: 0,5`

    `OK`

3. **Activate context one**

    Enter:

    Verizon:
    `AT#SGACT=3,1`

    Other Networks:
    `AT#SGACT=1,1`

4. **Set FTP operations timeout to 10 seconds**

    Enter:

    `AT#FTPTO=100`

5. **Configure FTP server IP address with username and password.**

    Enter:

    `AT#FTPOPEN="###.##.###.#","username","password",0`
    where ###.##.###.# is the IP address and the username and password for the FTP server.

6. **Configure file transfer type.**

    Enter:

    `AT#FTPTYPE=#`
    where # is 0 for binary or 1 for ASCII.

7. **If required, change the working directory to "folder1".**

    Enter:

    `AT#FTPCWD="folder1"`

8. **Enter the file name.**

    Enter:

    `AT#FTPGET="filename.txt"`
    where filename.txt is the file to download.

    The device responds with:

    `CONNECT`

    The file is received through the device. The device responds with:

    `NO CARRIER`

    The data connection closes automatically when the file sending ends.

Closing the FTP Data Connection

After the file is sent:

1. **Close the FTP connection.**

Enter:

```
AT#FTPCLOSE
```

2. Close the PPP data connection.

Enter:

Verizon:
```
AT#SGACT=3,0
```
Other Networks:
```
AT#SGACT=1,0
```
The device responds with OK.

Reading, Writing and Deleting Messages

Sending Text Messages

To send a text message in text mode:

1. Check signal strength.

Enter:

```
AT+CSQ
```

2. Verify device is registered on the cellular network.

Enter:

```
AT+CEREG?
```
Should return:
```
+CEREG: 0,1 or +CEREG: 0,5
OK
```

3. Put the device in text mode.

Enter:

```
AT+CMGF=1
```
The device responds.

```
OK
```

4. Enter the recipient's number and your message.

Enter:

```
AT+CMGS="##########"
 >Your message here
```
where ########## is the recipient's number.

5. Send the message.

Enter CTRL+Z.

The device responds:

```
+CMGS: #
OK
```
where # is the reference number of the sent message.

For example:

```
AT+CMGF=1
```

```
OK
AT+CMGS="0001112222"
> How are you?  <CTRL+Z to send>
+CMGS: 255
OK
```

Where 0001112222 is the phone number.

Reading Text Messages

NOTE: For CAT M1 devices, you can only send/receive SMS messages from other CAT M1 devices on the same network.

To read a text message in text mode:

1. **Send a message to the phone number of the currently installed SIM.**
2. **Put the device in text mode.**
   Enter:
   ```
   AT+CMGF=1
   ```
3. **Read message.**
   Enter:
   ```
   AT+CMGR=1
   ```

Example response:

```
+CMGR: "REC UNREAD","0001112222","","20161006135126"
How are you?
OK
```

Where 0001112222 is the recipient phone number and 20161006135126 is received data in the format YYYYMMDDHHMMSS.

Deleting Messages

To delete one text message, enter:

AT+CMGD=1,#

where 1 is the index in the selected storage and # is the delflag option. Enter:

0	Deletes message in the specified index.
1	Deletes all read messages from selected storage. Leaves unread messages and stored device-originated messages.
2	Deletes all read and sent device-originated messages. Leaves unread messages and unsent device-originated messages.
3	Deletes all read messages and sent and unsent device-originated messages. Leaves unread messages.
4	Deletes all messages from selected storage.

For example:

Delete message at index 1:

```
AT+CMGD=1
```

Delete message at index 2:
```
AT+CMGD=2
```

Deletes messages at index 1:
```
AT+CMGD=1,0
```

Deletes read messages at index 2, leaves unread and stored device-originated messages:
```
AT+CMGD=2,1
```

Deletes read messages at index 2 and sent device-originated messages:
```
AT+CMGD=2,2
```

Check valid memory locations <index> and supported values of <deflag>:
```
AT+CMGD=?
+CMGD: (1,2,3,6,7,17,18,19,20,37,38,39,47),(0-4)
OK
```

Revision History

Revision Number	Description	Revision Date
1.1	Added Carrier Specific Notice, Firmware Over the Air (FOTA).	July 2024
1.0	Original publication.	September 2023