



MultiConnect[®] Cell

MTC-MNG6 User Guide



MultiConnect[®] Cell Series 100 User Guide

Model: MTC-MNG6

Part Number: S000808 Rev. 1.1

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Chapter 1 – Product Overview

About the MultiConnect Cell Modem

The MultiConnect^{*} Cell 100 Series cellular modem is a compact communications platform that provides cellular capabilities for fixed and mobile applications. It is intended for use in settings demanding reliable performance under rugged conditions, low power and long range such as remotely monitoring solar micro-inverters, power generators, tanks, pipelines, meters, pumps and valves in any energy, utility or industrial application.



Documentation

The following documentation is available on the MultiConnect Cell 100 Series page. Select your model select the specific documentation for your device.

| Document | Description | Part Number |
|-------------------------------|--|---------------|
| MultiConnect Cell User Guide | This document. Provides hardware specifications and developer information. | S000808 |
| USB Driver Installation Guide | Provides instructions on how to install Windows USB driver. | S000616 |
| AT Commands Manual | Provides AT commands and parameters used to configure your device. | 80617ST10991A |

Product Build Options

| Product | Description |
|--------------|--|
| MTC-MNG6-B01 | LTE Cat M1 Modem, RS-232 interface with Accessory Kit |
| MTC-MNG6-B03 | LTE Cat M1 Modem, USB interface with USB Accessory Kit |

Chapter 2 – Hardware Information

Dimensions

USB





ALL DIMENSIONS IN In [mm]

Serial





ALL DIMENSIONS IN In [mm]

MTC-MNG6 Specifications

| Category | Description | | | |
|------------------------------|---|--|--|--|
| General | | | | |
| Standards | LTE UE Category M1 | | | |
| | 3GPP Rel. 14 Compliant | | | |
| | 3GPP Rel. 13 eDRx | | | |
| | 3GPP Rel. 13 extended coverage | | | |
| | 3GPP Rel. 12 PSM | | | |
| Frequency Bands | 4G Bands: B1, B2, B3, B4, B5, B8, B8_US, B12, B13, B18, B19, B20, B25, B26, B27, B28, B66 | | | |
| | 2G Bands: B2, B3, B5, B8 | | | |
| Speed | | | | |
| Data Speed | LTE Cat M1: Up to 1 Mbps uplink /Up to 588 Kbps downlink | | | |
| | 2G Fallback: Up to 210 Kbps uplink / Up to 264 Kbps downlink | | | |
| Interface | | | | |
| USB Interface | USB 2.0 high speed compatible | | | |
| UART Interface RS-232 levels | | | | |
| Physical Description | | | | |
| Weight | 0.4 oz. (10 g) | | | |
| Dimensions | Refer to mechanical drawings for dimensions. | | | |
| Connectors | | | | |
| Antenna Connectors | 1 SMA connectors for cellular | | | |
| SIM | 1.8V and 3V SIM holder for mini-SIM (2FF) 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 | Serial Models: 5-32 VDC | | | |
| | USB Models: 5V | | | |
| SMS | | | | |
| SMS | Point-to-Point messaging | | | |
| | Mobile-Terminated SMS | | | |
| | Mobile-Originated SMS | | | |

| Category | Description | | | | |
|--------------------------------|--------------------------------|--|--|--|--|
| Certifications and Comp | Certifications and Compliance | | | | |
| EMC and Radio | FCC Part 15 Class B | | | | |
| Compliance | FCC Part 22H, 24E, 27, 90 | | | | |
| | IC | | | | |
| | CE Mark, RED (EU) | | | | |
| | RCM | | | | |
| | UKCA | | | | |
| Safety Compliance | UL 62368-1 | | | | |
| | UL 60950-1 | | | | |
| | cUL 62368-1 | | | | |
| | 60950-1 | | | | |
| | IEC 62368-1 | | | | |
| | IEC 60950-1 | | | | |
| Network Compliance | PTCRB | | | | |
| Carrier | ATT/Verizon/T-mobile (pending) | | | | |

Descriptions of LEDs

The top panel contains the following LEDs:

- Power and Terminal Ready LEDs—The Power LED indicates that DC power is present and the TR LED indicates when the unit is ready to receive data.
- Modem LEDs—Two modem LEDs indicate carrier detection and link status.
- Signal LEDs—Three signal LEDs display the signal strength level of the wireless connection.

| LED Indicators | | | | |
|----------------|---|--|--|--|
| POWER | Indicates presence of DC power when lit. | | | |
| TR | <i>Serial models only.</i> Terminal Ready. When lit, indicates connection to terminal emulation. When not lit, indicates no terminal is present. | | | |
| CD | Serial models only. Carrier Detect. Indicates established data connection when lit. | | | |
| LS | Link Status. OFF — No power to the cellular radio Continuously lit — SIM is not installed, or no signal is present Slow blink — Registered | | | |
| PROG. SIGNAL | To use these LEDS, you can control them through the Appzone program which is loaded on the device at the factory. | | | |

Side Panels

The device has connectors on either side. The figures that follow show the side panels.



RS-232 9-Pin Female Connector



| Pin | Abbreviation | Description | In/Out |
|-----|--------------|---------------------|--------|
| 1 | CD | Carrier Detect | 0 |
| 2 | RX | Receive | 0 |
| 3 | ТХ | Transmit | I |
| 4 | DTR | Data Terminal Ready | I |
| 5 | GND | Ground | |
| 6 | DSR | Data Set Ready | 0 |
| 7 | RTS | Request to Send | I |
| 8 | CTS | Clear to Send | 0 |
| 9 | RI | Ring Indicator | 0 |

Power Measurements

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

Serial Model: MTC-MNG6-B01 Power Draw

| Radio Protocol | Sleep Mode Current | Cellular Connection Idle, No Data | Live Connection Idle Current | Average Current at Max Power | Average TX Pulse Amplitude Current | Total Inrush Charge | Total Inrush Charge Duration During Powerup |
|--------------------------------|-----------------------|---|------------------------------------|------------------------------------|---|------------------------|---|
| 9 Volts | | | | | | | |
| LTE 707.5 MHz Band 12 | 6 mA | 23 mA | 23 mA | 191 mA | 452 mA | 0.103 mC | 9.0 mS |
| GSM 850 MHz | 8 mA | N/A | 24 mA | 158 mA | 1.11 A | 0.103 mC | 9.0 mS |
| 12 Volts | | | | | | | |
| LTE 707.5 MHz Band 12 | 5 mA | 16 mA | 22 mA | 149 mA | 308 mA | 0.076 mC | 7.3 mS |
| GSM 850 MHz | 6 mA | N/A | 12 mA | 239 | 239 | 0.076 mC | 7.3 mS |
| 24 Volts | | | | | | | |
| LTE 707.5 MHz Band 12 | 3 mA | 12 mA` | 13 mA | 87 mA | 140 mA | 0.103 mC | 7.4 mS |
| GSM 850 MHz | 4 mA | N/A | 12 mA | 86 mA | 432 mA | 0.103 mC | 7.4 mS |

USB Model: MTC-MNG6-B03 Power Draw

| Radio Protocol | Sleep Mode Current | Cellular Connection Idle, No Data | Live Connection Idle Current | Average Current at Max Power | Average TX Pulse Amplitude Current | Total Inrush Charge | Total Inrush Charge Duration During Powerup |
|-------------------|-----------------------|---|------------------------------------|---------------------------------------|---|------------------------|--|
| 5 Volts | | | | | | | |

| Radio Protocol | Sleep Mode Current | Cellular Connection Idle, No Data | Live Connection Idle Current | Average Current at Max Power | Average TX Pulse Amplitude Current | Total Inrush Charge | Total Inrush Charge Duration During Powerup |
|-----------------------------|-----------------------|---|------------------------------------|---------------------------------------|---|------------------------|--|
| LTE 707.5 MHz Band 12 | N/A | 26 mA | 26 mA | 325 mA | 828 mA | 0.447 mC | 129.8 uS |
| GSM 850 MHz | N/A | 24 mA | N/A | 312 mA | 1.6 A | 0.447 mC | 129.8 uS |

Chapter 3 – Antenna and Activation Information

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.

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 |

| Category | Description |
|--------------|-------------------------|
| 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) |

Chapter 4 – 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 5 – Safety Warnings

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).

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 6 – Installing and Using the Device

Installing a SIM Card

This model requires a mini (3FF) SIM card, which is supplied by your cellular 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 down as shown. When the SIM card is installed, it locks into place.



Device Phone Number

Every device has a unique phone number. Your cellular service provider supplies a phone number when you activate your account. Wireless service provider implementation may vary. Consult with your cellular service provider to get the phone number for your device.

Removing a SIM Card

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

Installing the Device

- 1. After installing the SIM card, connect the antenna(s) included with your device to the antenna connector(s).
- 2. If your device is the serial version:
 - a. Connect the DE9 male connector (9-pin) of the RS-232 cable to the RS-232 connector on the device, then connect the other end to the serial port on the other desired device.
 - **b.** Screw-on the power lead from the power supply module into the power connection on the device.
 - c. Plug the power supply into your power source.
- **3.** If your device is the USB version:
 - a. See the section "USB Cable Recommendations" for information about the USB cable that helps power your device.
 - **b.** The USB cable uses power from the USB power line. Connect one end of the USB cable to your computer or other USB high power device, such as a hub.
 - c. Connect the other end to the device's USB connector.
- 4. The POWER LED lights after the device powers up.

Placing Serial Devices in Power Save Mode

The serial devices offer a low power mode (sleep or power save mode) using the power save switch (below the SIM card slot) on the device to change from normal or low power mode. The low power mode is intended for battery or solar-powered, IoT applications such as outdoor remote sensors.

There are other techniques to place the device into low power mode. This example uses data terminal ready (DTR) and the AT command +CFUN=5. For other techniques, review the AT command guide for your device, as described in the Documentation section of this guide.

The device also wakes up from sleep mode by using the wake-on-ring feature. See the following example using the ring indicator line to wake the host processor when the radio receives an incoming call or SMS message. Your application then needs to act on the ring indication and wake up the device by asserting DTR.

Using Low Power Mode

Here are some different configuration options for low power mode:

- To turn on low power mode, set the power-save switch to LOW.
- On the RS-232 interface, ensure your application controls DTR and makes it active (on). To configure the device for DTR control, issue either AT&D1 or AT&D2 for DTR control. The &D0 command does not allow low power to operate.
- To configure the device to enter low power (sleep) mode, issue AT+CFUN=5 to the radio.
- To configure the device to wake from low power mode by using the wake-on-ring feature, issue AT#E2SMSRI=1000. This configures the ring indicator to go active for 1000 ms when an SMS message is received.
- To have the device enter sleep mode, set DTR to inactive (off) on the RS-232 interface. The clear to send (CTS) signal is off when the device is in sleep mode.

USB Cable Recommendations

To avoid enumeration or power issues if your device has a USB connector:

- Use a high-speed USB cable that is as short as possible.
- Use a well-shielded cable with at least 24 AWG wire pair for power/ground and 28 AWG wire pair for data lines.
- If possible, use a USB port that connects directly to the motherboard rather than a USB port with added cabling inside the computer chassis.
- Use USB 3.0 ports if available. These ports are typically rated for more current.
- The USB cable is available through MultiTech. The part number is CA-USB-A-MINI-B-3

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 7 – Configuring and Communicating with Your Device

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.

Configuring Device Firmware for Your Cellular Network

Before connecting to a cellular network, you need to configure the device for that cellular network. This step is required only the first time you use the device and if you change cellular carrier.

Important: Configure the device for Cat M1 use only. Use AT#WS46=0 to ensure the device is in Cat M1 mode. Failure to set the device for Cat M1 use only may delay network registration times and cause the device to be used in a manner for which it was not approved.

Carrier Values

- 0 AT&T/other networks
- 1 Verizon
- 2 ROW (Other global).
- 3 Australia

Checking the Cellular Network

To check the device's current cellular network:

AT#FWSWITCH?

Setting the Cellular Network

To set the cellular network, issue the following:

```
AT#FWSWITCH=<carrier value>, 1, 1,
Where carrier value is the 1, 2, 3, or 4 depending on your network.
```

The device automatically reboots twice. After the second reboot, the device is ready for configuring the data connection.

Note: 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).

For more information on AT#FWSWITCH, refer to the AT command reference guide.

Examples

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

To switch carrier networks:

From AT&T to Verizon:

AT#FWSWITCH=1,1,1

From Verizon to AT&T:

AT#FWSWITCH=0,1,1

Registering the Device on a Cellular Network

When configured with AT+COPS=0 the device automatically attempts to register with a carrier network. With the SIM and device properly configured and good reception network registration takes less than a minute. Otherwise, it may take more than 5 minutes.

To determine the device's registration status, use one of the following three AT commands. If any return n,1 or n,5 then the device registered with the network automatically:

```
AT+CREG?
AT+CEREG?
AT+CGREG?
```

Return Values

- n,0 = Time-out or not searching
- n,1 = Registered
- n,2 = Searching
- n,3 = Carrier denied connection (contact carrier for guidance)
- n,5 = Registered, roaming

If the device has not registered with the network, wait a few minutes before issuing one of the AT+C*REG commands again.

Examples

```
AT+CREG?
+CREG: 0,1
OK
AT+CEREG?
+CEREG: 0,1
OK
AT+CGREG?
+CGREG: 0,1
OK
```

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 |
| <sc< th=""><th> > </th><th>LTE - RSRQ (in dBm):</th></sc<> | > | 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

Sending and Receiving Data

Connecting Device to TCP Server as TCP Client

- AT+CGDCONT=1, "IPV4V6", "apnname" where apnname is the APN your cellular provider assigned to your SIM card.
- 2. Reset the radio module

```
Enter:
AT+CFUN=1,1
OK
```

3. 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

4. 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: 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:

- Enter the escape sequence:
 +++
- 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:

- 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.

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

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.
- 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.

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.

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. |

Deletes all messages from selected storage.

For example:

4

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
```

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.

Chapter 8 – Regulatory Information

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.

FCC Grant Information

| FCC Identifier: | RI7ME910G1WW |
|------------------|-----------------------------|
| Equipment Class: | PCS Licensed Transmitter |
| Notes: | ME910G1-WW LTE Module CAT M |
| Approval: | Single Modular |

| FCC Rule Part | Frequency Range (MHz) | Power Output (mW) | Frequency Tolerance (PPM) | Emission Designator |
|---------------|--------------------------|----------------------|------------------------------|------------------------|
| 22H | 824.2 - 848.8 | 1.79 | 2.5 PM | 246KGXW |
| 22H | 824.2 - 848.8 | 2.1 | 2.5 PM | 246KGXW |
| 22H | 824.2 - 848.8 | 0.61 | 2.5 PM | 248KG7W |
| 22H | 824.1 - 848.9 | 0.19 | 2.5 PM | 129KG7D |
| 22H | 824.1 - 848.9 | 0.21 | 2.5 PM | 190KG7D |
| 22H | 824.7 - 848.3 | 0.22 | 2.5 PM | 1M10G7D |
| 22H | 824.7 - 848.3 | 0.22 | 2.5 PM | 1M10W7D |
| 22H | 824.1 - 848.9 | 0.24 | 2.5 PM | 132KG7D |
| 22H | 824.1 - 848.9 | 0.22 | 2.5 PM | 191KG7D |
| 22H | 824.7 - 848.3 | 0.23 | 2.5 PM | 1M10G7D |
| 22H | 824.7 - 848.3 | 0.24 | 2.5 PM | 931KW7D |
| 24E | 1850.2 - 1909.8 | 1.22 | 2.5 PM | 244KGXW |
| 24E | 1850.2 - 1909.8 | 1.1 | 2.5 PM | 246KGXW |
| 24E | 1850.2 - 1909.8 | 0.47 | 2.5 PM | 247KG7W |
| 24E | 1850.1 - 1909.9 | 0.21 | 2.5 PM | 127KG7D |
| 24E | 1850.1 - 1909.9 | 0.24 | 2.5 PM | 191KG7D |
| 24E | 1850.7 - 1909.3 | 0.23 | 2.5 PM | 1M10G7D |
| 24E | 1850.7 - 1909.3 | 0.23 | 2.5 PM | 926KW7D |
| 24E | 1850.1 - 1914.9 | 0.22 | 2.5 PM | 129KG7D |
| 24E | 1850.1 - 1914.9 | 0.23 | 2.5 PM | 191KG7D |
| 24E | 1850.7 - 1914.3 | 0.23 | 2.5 PM | 1M11G7D |
| 24E | 1850.7 - 1914.3 | 0.24 | 2.5 PM | 936KW7D |
| 27 | 1710.1 - 1754.9 | 0.22 | 2.5 PM | 130KG7D |
| 27 | 1710.1 - 1754.9 | 0.23 | 2.5 PM | 191KG7D |
| 27 | 1710.7 - 1754.3 | 0.24 | 2.5 PM | 1M10G7D |
| 27 | 1710.7 - 1754.3 | 0.23 | 2.5 PM | 940KW7D |
| 27 | 699.1 - 715.9 | 0.19 | 2.5 PM | 128KG7D |

| FCC Rule Part | Frequency Range (MHz) | Power Output (mW) | Frequency Tolerance (PPM) | Emission Designator |
|---------------|--------------------------|----------------------|------------------------------|------------------------|
| 27 | 699.1 - 715.9 | 0.23 | 2.5 PM | 184KG7D |
| 27 | 699.7 - 715.3 | 0.22 | 2.5 PM | 1M10G7D |
| 27 | 699.7 - 715.3 | 0.2 | 2.5 PM | 938KW7D |
| 27 | 777.1 - 786.9 | 0.19 | 2.5 PM | 129KG7D |
| 27 | 777.1 - 786.9 | 0.23 | 2.5 PM | 184KG7D |
| 27 | 779.5 - 784.5 | 0.2 | 2.5 PM | 1M10G7D |
| 27 | 779.5 - 784.5 | 0.2 | 2.5 PM | 939KW7D |
| 90 | 814.1 - 823.9 | 0.2 | 2.5 PM | 127KG7D |
| 90 | 814.1 - 823.9 | 0.21 | 2.5 PM | 190KG7D |
| 90 | 814.7 - 823.3 | 0.22 | 2.5 PM | 1M10G7D |
| 90 | 814.7 - 823.3 | 0.21 | 2.5 PM | 925KW7D |

Output power is conducted.

This grant is valid only when the module is sold to OEM integrators and must be installed by the OEM integrators. This device is to be used only for mobile and fixed application. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter evaluation procedures as documented in this filing. End-users may not be provided with the module installation instructions. OEM integrators and end-users must be provided with transmitter operating conditions for satisfying RF exposure compliance.

The highest antenna gain including cable loss, must not exceed 8.0 dBi for Band 2 and Band 25, 5.0 dBi for Band 4 and Band 66, 9.4 dBi for Band 5, 8.7 dBi for Band 12, 9.1 dBi for Band 13, 9.3 dBi for Band 26, 6.9 dBi for GPRS/EDGE 824-849MHz Band, 2.5 dBi for GPRS/EDGE 1850-1910MHz Band . This device contains functions that are not operational in U.S. Territories. This filing is only applicable for U.S. operations.

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.

Canadian Limitations

Notice: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Notice: The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

Limitations canadiennes

Avis: Cet équipement respecte les spécifications techniques des équipements terminaux d'Industrie Canada. Cette conformité est confirmée par le numéro d'enregistrement. L'abréviation IC précédant le numéro d'enregistrement signifie que l'enregistrement a été effectué conformément à une Déclaration de Conformité indiquant que les spécifications techniques d'Industrie Canada ont été respectées. Ceci n'indique pas que cet équipement a été approuvé par Industrie Canada.

Avis: L'IES (indice d'équivalence de la sonnerie) attribué à chaque terminal fournit une indication du nombre maximal de terminaux pouvant être connectés à une interface téléphonique. La terminaison d'une interface peut être constituée de n'importe quelle combinaison d'appareils à la seule condition que la somme des indices d'équivalence de sonnerie de l'ensemble des appareils ne dépasse pas cinq.

EMC, Safety, and Radio Equipment Directive (RED) Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment;

and

Council Directive 2014/53/EU on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

MultiTech declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. The declaration of conformity may be downloaded at https://multitech.com/product-support/

EMC, Safety, and Radio Equipment Regulations (UKCA)

For models designated for use in the UK, the following applies:



The UKCA mark is to confirm conformity with the relevant UKCA harmonization legislation:

| 2017 No 1206 | The Radio Equipment Regulations 2017 |
|--------------|--|
| 2016 No 1101 | The Electrical Equipment Safety Regulations 2016 |
| 2016 No 1091 | The Electromagnetic Compatibility Regulations 2016 |
| 2012 No 3032 | The Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 |

MultiTech declares that this device is in compliance with the essential requirements and other relevant provisions of the above regulations. The UKCA Declaration of Conformity may be requested at https://www.multitech.com/support/support

Regulatory Compliance Mark (RCM) for Australia



This product complies with the requirements of the Regulatory Compliance Mark (RCM) for Electrical Regulatory Authorities Council (ERAC), Electrical Equipment Safety System (EESS), and the Australian Communications and Media Authority (ACMA) for Electromagnetic Compatibility (EMC).

Chapter 9 – Environmental Notices

Waste Electrical and Electronic Equipment Statement

WEEE Directive

The WEEE Directive places an obligation on EU-based manufacturers, distributors, retailers, and importers to takeback electronics products at the end of their useful life. A sister directive, ROHS (Restriction of Hazardous Substances) complements the WEEE Directive by banning the presence of specific hazardous substances in the products at the design phase. The WEEE Directive covers all MultiTech products imported into the EU as of August 13, 2005. EU-based manufacturers, distributors, retailers and importers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

Instructions for Disposal of WEEE by Users in the European Union

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, contact your local city office, your household waste disposal service or where you purchased the product.

July, 2005



REACH-SVHC Statement

Registration of Substances

Multi-Tech Systems, Inc. confirms that none of its products or packaging contain any of the Substances of Very High Concern (SVHC) on the REACH Candidate List, in a concentration above the 0.1% by weight allowable limit.

For the current REACH-SVHC statement and additional regulatory documents, visit: https://multitech.com/product-support/

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 10 – Using Connection Manager

Use Connection Manager to:

- Install the latest device drivers.
- Connect your device to your carrier's network.

Note: Connection Manager can install drivers and connect your device regardless of your cellular network; however, activation is only supported with Verizon, Aeris, and some regional carriers.

- Switch the firmware in your device to a different carrier (if supported by your device).
- Manage cellular connection and automatically reconnect with the keep-alive feature.
- View device details.
- View line charts of signal level and data rates.
- Use a terminal window for communicating with and troubleshooting the device.

Note: If you have an older version of Connection Manager, uninstall it before installing a new version. For details, refer to Uninstalling Connection Manager.

Installing Connection Manager

Connection Manager installs the appropriate drivers for USB devices along with the application. Serial devices do not require drivers.

Note: Attempting to plug in the device before the appropriate drivers are installed can cause the connection to fail.

To install Connection Manager and the device drivers:

- 1. Go to https://multitech.com/all-products/software-management/connection-manager/.
- 2. Click Connection Manager.
- 3. Open or unzip the **Connection Manager** file and run the installer (.msi file).
- 4. On the MultiTech Connection Manager Setup Wizard Welcome Panel, click Next.
- 5. Read the end-user license agreement and check I accept the terms in the License Agreement. Click Next.
- 6. Click Next to have the installer automatically disable the native WWAN AutoConfig service in Windows.

The WWAN AutoConfig service manages mobile broadband connections. Connection Manager requires that this service be disabled.

Note: This page appears in Windows 10 and Windows 11.

- 7. If any Multichannel device is connected to the computer, disconnect it and click Next.
- 8. If you use a USB device, check Install the modem driver.

CAUTION: Unless you are certain that the drivers for your USB device are already installed on the computer, make sure that you check **Install the modem driver**. Failure to do this will cause the application to incorrectly detect your device or not detect the device at all.

Note: Because serial devices do not require drivers, it does not matter if you check or uncheck **Install the modem driver** for a serial device.

9. To specify a folder for Connection Manager, use the default folder or click **Change** to browse to the folder you want to use. Click **Next**.

- **10.** Click **Install**. Windows may prompt you to allow the installer to make changes to your computer. Click **Yes**.
- **11.** In the Setup Wizard, click **Finish**.

Note: To open Connection Manager automatically after installation, check **Start the MultiTech Connection Manager when the installation is finished**.

If using a USB device, you can connect the device to the carrier's network with Connection Manager. Refer to Connecting a Device.

If using a serial device, you need to set up the device in Windows Device Manager before connecting the device. Refer to Setting Up a Serial Device in Windows Device Manager.

Setting Up a Serial Device in Windows Device Manager

To set up the device in Windows Device Manager:

- 1. Make sure that your desired COM port for the serial device is available.
- 2. Connect the serial device to the PC.
- 3. Go to **Control Panel** > **Device Manager**. Make a note of the COM port number for the connected device (in **COM Ports**).

Example: The COM port is COM31.

4. Go to Action > Add legacy hardware.



5. In the Add Hardware Wizard:

a. Click Next.

- **b.** Select **Install the hardware that I manually select from a list**, then click **Next**.
- c. Select Modems, then click Next.
- d. Check Don't detect my modem; I will select it from a list, then click Next.
- e. Select Standard Modem Types, then select Standard 33600 bps Modem on the right.

Important: Make sure that you select *only* **Standard 33600 bps Modem**. Selecting another model may cause your device to work incorrectly or fail.

- f. Select your COM port, then click **Next**.
- g. Click Finish.
- h. Go to **Device Manager > Modems** and confirm that the device is added.
- 6. To verify that the device is set up correctly, query the device:
 - a. Go to Device Manager > Modems, right-click Standard 33600 bps Modem, and select Properties.
 - **b.** On the **Diagnostics** tab, click **Query Modem**.

Note: The device cannot be queried if the Connection Manager is running and using the device's port.

If the device is ready, diagnostic information from the device appears in the box above.

To connect the device to your carrier's network, refer to Connecting a Device.

Connecting a Device

Before You Begin

- Make sure that your device is connected to the computer where Connection Manager is installed.
- If you have a serial device, set up the device in Device Manager. Refer to Setting Up a Serial Device in Windows Device Manager.

To connect your device to the carrier's network:

1. Open Connection Manager.

Connection Manager automatically detects the connected device, and the **Detect** button on the **Main** tab changes to **Connect**. If the application cannot detect the device automatically, click **Detect** to initiate device detection manually.

2. If you are connecting the device to this computer for the first time, on the **Connection** dialog box, provide values for the connection settings, such as the dial number and access point name (APN).

You may need to ask the carrier for these settings.

a. To monitor Internet connectivity, have Connection Monitor send periodic pings to a host, check **Enable keep-alive** and enter the IP address or host name to ping in the **Host to ping** box. For example, you can enter the host name google.com or IP address **8.8.8.8**.

If the keep-alive check fails, Connection Manager automatically reconnects. When the keep-alive feature is enabled, the Connection Manager's **Main** tab displays the keep-alive check status and when the last ping response was received.

b. If your device supports dual carriers, switch the firmware to the desired carrier by selecting the carrier in the **MNO Firmware** list. For example, if your device can switch the firmware between AT&T and Verizon, select **Verizon** in the list.

Note:

- The MNO Firmware list doesn't appear if your device doesn't support carrier firmware switching.
- When you change the carrier firmware, the modem automatically restarts to apply the selected firmware.
- c. To save the settings, click **Apply**.

You can change the connection settings on the **Connection** tab. The **Dial number**, **APN**, **User name**, and **Password** cannot be changed after the device is connected.

- **3.** On the **Settings** tab, select **USB Modem** or **Serial Modem** depending on whether you are connecting a USB or serial device.
- 4. If you are connecting a serial device, provide the serial settings on the **Settings** tab:
 - a. In the Modem type list, select the appropriate modem type.
 - **b.** For the other settings, provide the values that match the serial-port settings for the device in Device Manager.

For **Port**, expand **Ports** and notice the COM port number next to the device name. Right-click the device name, select **Properties**, and find the values for the other settings on the **Port Settings** tab.

c. To save the settings, click **Apply**.

Note:

- Settings displayed for a USB device on the Settings tab are determined automatically and cannot be changed.
- To set the application to run during Windows startup, check **Run application at Windows startup**.
- To automatically connect to the Internet, check Connect to the Internet automatically.

Selecting **Run application at Windows startup** and **Connect to the Internet automatically** is useful in scenarios where Connection Manager is running on a remote computer. If a power failure occurs on the computer, these settings ensure the application will restart and reconnect to the Internet when power is restored.

5. On the Main tab, click Connect.

When a connection is established, the **Main** tab displays the download and upload speeds, the amount of traffic sent and received, **Connected** status, and the signal strength percentage and bars. The statistics on connection speeds and traffic are available only during a current connection session.

Note:

- For serial modems, the signal strength is available only when the device is *not* connected to the carrier's network. When connection to the network is established, the last signal strength value is displayed.
- View the details for the current connection on the **Details** tab.

To disconnect the device from the carrier's network, click **Disconnect**.

Important: Disconnect the device in Connection Manager before disconnecting a device from the computer.

Uninstalling Connection Manager

Along with uninstalling Connection Manager, the installed device drivers are also removed.

Before You Begin

Make sure that Connection Manager is not running.

To uninstall Connection Manager:

- 1. In Windows, go to **Control Panel > Programs > Programs and Features**.
- 2. Right-click MultiTech Connection Manager and select Uninstall.
- 3. Click **Yes** to confirm that you want to uninstall Connection Manager.

The native Windows WWAN AutoConfig service is automatically enabled.

4. When the message "Are you sure you want to uninstall this product?" appears, click Yes.

Connection Manager and the installed drivers are removed from the computer.

Note: The steps above describe how to uninstall Connection Manager using Control Panel. You can also uninstall the application by using the installer file (.msi). Double-click the file, in the MultiTech Connection Manager Setup Wizard, click **Next**, and then select **Remove** on the next two pages.

Connection Manager User Interface

Connection Manager consists of the following tabs:

- Main
- Settings
- Connection
- Details
- Terminal
- Charts

| MultiTech Connection Manager 1.0.6.77 | | | | | × |
|---------------------------------------|---------------------------|----------------|---------------------------------|-------------------|---|
| MULTITECI Main | HO Settings Connectior | Details | Terminal | Charts | |
| Statist | ics | | Connected | | |
| Download: | 0 B/s | | ъШ | | |
| Upload: | 847 B/s | | 58% | | |
| Sent: | 37.39 Kb | | | | |
| Received: | 24.39 Kb | Keep Last j | -alive check: ping response: | Success 879 ms | |
| | | | Di | sconnect | |

Main tab

The Main tab displays the following:

- Status of device connection: Searching, Connecting, Connected, Disconnecting, or Disconnected
- The action button, which changes according to the current device connection status: Detect, Connect, or Disconnect
- Signal strength bars and percentage indicator (only when connection to the carrier's network is established)

Note: The signal strength is displayed for a serial device only when the device is not connected to the carrier's network.

- Connection statistics: download and upload speeds, amount of traffic sent and received (only when connection to the carrier's network is established)
- The keep-alive check status and when the last ping response was received if Enable keep-alive check is checked on the Connection tab.

Settings tab

Use the Settings tab to specify the type of device: USB Modem or Serial Modem.

- If **USB Modem** is selected, the tab displays USB settings. These settings cannot be edited.
- If **Serial Modem** is selected, the tab displays the serial settings that match the serial-port settings for the device. You can edit these settings.

The **Settings** tab also contains the **Run application at Windows startup** and **Connect to the Internet automatically** options.

- Check Run application at Windows startup to open Connection Manager when Windows starts.
- Check Connect to the Internet automatically to set Connection Manager to connect to the carrier's network automatically each time the application opens.

Connection tab

The **Connection** tab displays the following:

- The carrier-provided connection settings.
- The Enable keep-alive check box. Check this box to monitor connectivity to the Internet. Check Enable keep-alive check and enter the IP address or host name to ping in the Host to ping box. Connection Monitor will send periodic pings to the host. If the keep-alive feature fails, Connection Manager will automatically reconnect.
- The **MNO firmware** list. If your device supports dual carriers, you can switch the firmware to the other carrier by selecting the carrier in this list.

Note: The **Connection** tab isn't available if Connection Manager doesn't detect a device.

Details tab

The **Details** tab displays the modem details when a device is detected and the connection details when a connection is established.

Terminal tab

The **Terminal** tab contains a terminal window to communicate with the connected device by entering AT commands. For details, refer to the AT Commands reference guide for your device.

Note: When a serial device is connected to the carrier's network, the terminal window isn't available.

Charts tab

The **Charts** tab contains line charts that graphically represent signal strength and download and upload speeds for the 2-hour interval.

Troubleshooting

Serial COM port is not available in the Serial Modem Settings

Close Connection Manager and reopen it.

Device is not detected ("No Device")

After following the steps to activate your device, the Main tab still indicates "No Device."

Try the following steps:

- 1. Click the **Settings** tab and make sure that the appropriate modem type is selected: USB or Serial.
- 2. If you are connecting a serial device, make sure that all serial modem settings correspond to the serial modem and serial port configuration.
- 3. Restart Connection Manager.
- **4.** Disconnect and reconnect the device.

USB Modem is not detected

1. Check the LS LED and Power LED (if available) on the device.

If they are not continuously lit, then the problem is with the power supply. Check the cable and connections.

If the LS LED is not blinking, then the problem is with the power supply. Check the cable and connections.

2. USB device: Make sure that the device is connected to the PC and that the correct USB cable is in use.

Connection Manager is not working, and a device connected to the computer is not detected

Connection Manager cannot detect a connected device because the required drivers are not installed. The most likely cause is that **Install the modem drivers** was not checked during the installation.

Uninstall and re-install Connection Manager. During the installation, make sure that you check **Install the modem driver**. Refer to Uninstalling Connection Manager and Installing Connection Manager.

Connection Manager displays "Device Error" status for a serial device

This error has the following causes and solutions.

| Cause | Solution |
|---|--|
| Connection Manager cannot open the COM port that the device was installed on because the port is being used by another program. | If possible, free up the COM port for the device. |
| The wrong COM port is specified for the device on the Settings tab. | On the Settings tab, select the COM port that matches the port that the device is installed on and click Apply . You can look up the port in Device Manager in Windows. In Device Manager, expand Modems , right- click the name of your device, and select Properties . Note the port on the Modem tab. |

System Cannot Connect to Serial Device

If your system cannot establish a connection with a serial device, verify Connection Manager settings match modem and serial port settings on the computer.

| In Connection Manag | er, click on | the Settings tab |
|---------------------|--------------|------------------|
|---------------------|--------------|------------------|

| MultiTech Conn | ection Manager 2 | 2.2.0.4 | | | × |
|---|---------------------------------------|---------------|---------------|----------|--------|
| MULTITE | CH 🔘 | | | | |
| Main | Settings | Connection | Details | Terminal | Charts |
| O USB Modem | Serial Mod | dem | | | |
| Port: | | | Parity: | | |
| COM10 | | ~ | None | | ~ |
| Bits per second: | | | Stop bits: | | |
| 115200 | | \sim | 1 | | ~ |
| Data bits: | | | Flow control: | | |
| 8 | | ~ | None | | ~ |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Run application Connect to the | n at Windows star Internet automat | tup ically | | | Apply |

In Device Manager, open Modems and then right-click on your device and select open the Properties.

Note: If Modems and Ports don't appear in Device Manager, open the **View** Menu and select **Show hidden devices**.

Click on the **Modem** tab to confirm the **Maximum Port Speed** matches Bits per second setting in Connection Manager.

| Standard 33600 bps Modem Properties | | | \times | | | | |
|-------------------------------------|--------------------------|-------------------|---------------|--------|---------|--------|----|
| General | Modem | Diagnostics | Advanced | Driver | Details | Events | |
| Port: | COM10 | | | | | | |
| Spea | aker volum Low | e | — Hi | gh | | | |
| Maxi | mum Port 1 | Speed 00 | | 1 | | | |
| Dial | Control — Wa | ait for dial tone | before dialin | 9 | | | |
| | | | | 0 | К | Canc | el |

In **Device Manager**, open **Ports (COM & LPT)** and then right-click on the Com Port used by your device and select **Properties.**

Click on the Port Settings tab to confirm the **Bits per second**, **Date bits**, **Parity**, **Stop bits** and **Flow control** match those settings in Connection Manager.

| General Port Settings Driver Details Events Bits per second: 115200 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None • Advanced Restore Defaults |
|---|
| Bits per second: 115200 Data bits: 8 Parity: None Stop bits: 1 Flow control: None Advanced Restore Defaults |
| Advanced Restore Defaults |
| 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. | November 2023 |