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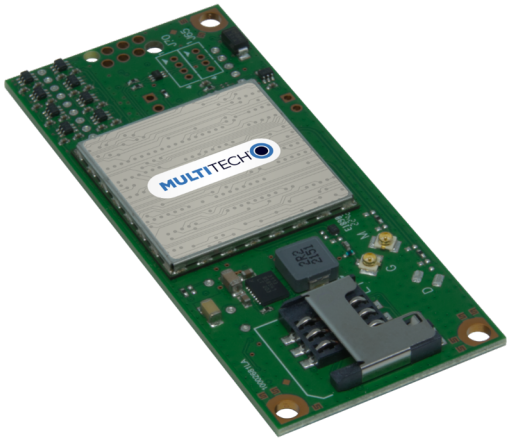

SocketModem® Cell

MTSMC-MNG6 Device Guide

SocketModem® Cell Device Guide

Models: MTSMC-MNG6, MTSMC-MNG6-U

Document Part Number: S000823 Rev. 1.2

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Chapter 1 Product Overview

Product Overview

SocketModem Cell models are complete, ready-to-integrate communications devices that offer standards-based LTE Cat M1 performance. Designed for IoT applications, these models offer enhanced coverage and optimized power consumption. These quick-to-market communications devices allow developers to add wireless communication to products with a minimum of development time and expense. SocketModem Cell models are based on industry-standard open interfaces and use MultiTech's Universal Socket design.

Important: The MTSMC-MNG6 must be configured for Cat M1 use only. Use AT#WS46=0 to ensure the device is in Cat M1 mode.

Documentation

The following documentation is available at https://www.multitech.com/resources/manuals.

Document	Description	Part Number
SocketModem Cell Cat-M1 MTSMC-MNG6 Device Guide	This document. Provides overview, safety and regulatory information, design considerations, schematics, and device information.	S000823
Universal Developer Kit 2.0 Developer Guide	Information for developing with the MTUDK2 Developer Kit. Includes an overview, design considerations, schematics, and installation and operation information.	S000779
USB Driver Installation Guide	Instructions for installing USB drivers on Linux and Windows Systems.	S000616
AT Commands Reference Guide	Lists AT Commands and parameters used to configure your device.	80617ST10991A

Product Build Options

Product	Description	Carrier/Region
MTSMC-MNG6	Embedded LTE Cat M1/2G Modem/Serial w/GNSS	AT&T, Verizon, T-Mobile (pending), Australia/New Zealand, Canada, European Union, United Kingdom, United State
MTSMC-MNG6-U	Embedded LTE Cat M1/2G Modem/USB w/GNSS	AT&T, Verizon, T-Mobile (pending), Australia/New Zealand, Canada, European Union, United Kingdom, United State
Developer Kit		

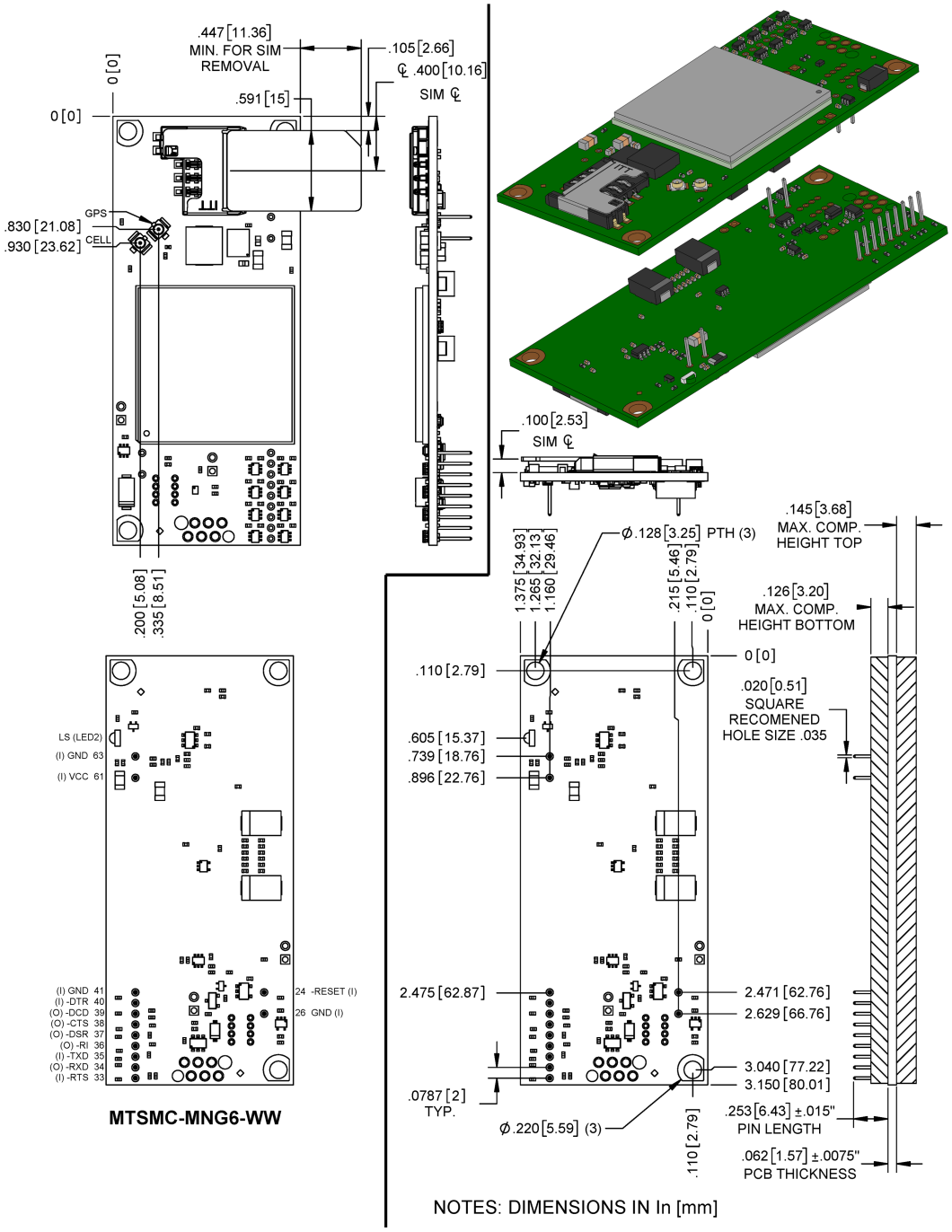
Product	Description	Carrier/Region
MTUDK2-ST-Cell.R1	Developer Kit for SocketModem and SocketModem MTQ cellular devices (DB9 RS-232 Connector and USB).	N/A

Note:

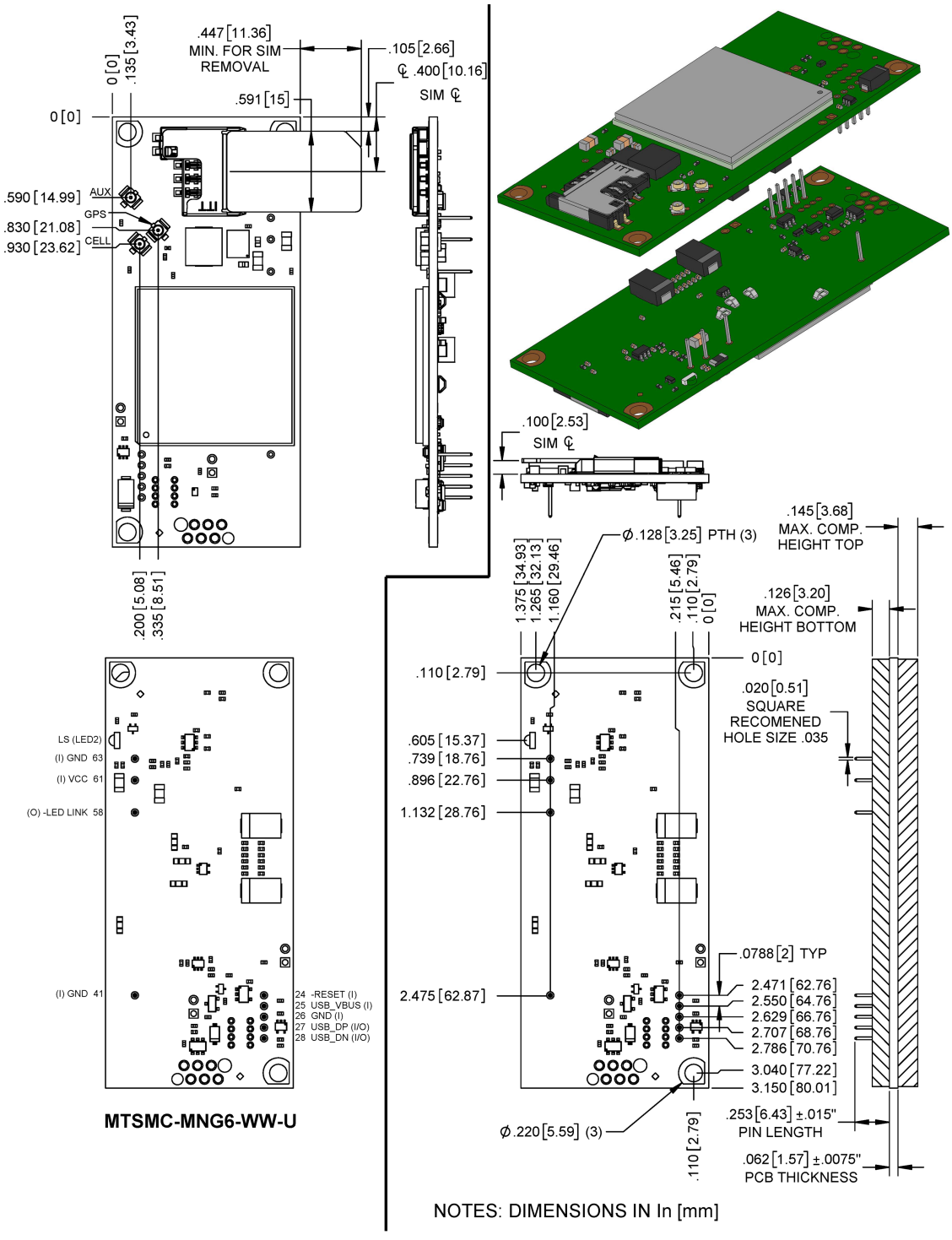
- These units ship without network activation.
- To connect them to the cellular network, you need a cellular account. For more information, refer to *SIM Card and Account Activation*.
- The complete product code may end in .Rx. For example, MTSMC-MNG6.Rx, where R is revision and x is the revision number.
- All builds can be ordered individually or in 50-packs. Add SP to the model number for a single pack.

Chapter 2 Dimensions

MTSMC-MNG6



MTSMC-MNG6-xx-U



Chapter 3 Specifications

MTSMC-MNG6 and MTSMC-MNG6-U 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
TCP/IP Functions	SSL, IPv4/IPv6 stack with TCP and UDP protocol
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
Serial Modem Interface	Up to 921.6 Kbps
Physical Description	
Weight	0.4 oz. (10 g)
Dimensions	Refer to *Dimensions*.
Connectors	
Antenna Connector	2 UFL antenna connectors: Cell and GPS.
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

Category	Description
Power Requirements	
Input Voltage (USB Models)	5.0 VDC
Input Voltage (Serial Models)	3.3 VDC or 5.0 VDC
Certifications and Compliance	
EMC and Radio Compliance	FCC Part 15 Class B
	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)

Power Down the 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 or hold the reset line (pin J24) LOW.
2. Wait for 30 seconds.
3. Remove power to the MTSMC.

Device RESET (Pin J24)

Note: Take note of how your software controls this pin to avoid unnecessary power cycling.

The RESET pin takes care of properly powering up and powering down the cellular radio module.

Holding the RESET pin LOW for >50ms initiates a power up or power down sequence, depending on its previous state.

RESET Function on Initial Power Up

Regardless of the RESET pin's state, the cell radio initiates a power up sequence on the first power up. At the end of the power up cycle, the state of the RESET pin is sampled again.

- The full power up cycle may take up to 30 seconds before all AT commands are available.
- If the RESET pin is LOW when the radio completes the power up sequence, the radio initiates a power down sequence.

RESET Function when the Radio Module is Powered

If the RESET pin is LOW, the radio initiates a power down sequence.

- The full power down cycle may take up to 65 seconds, during which time the radio is properly deregistered.
- If the RESET pin is in a continuous LOW state, the radio will stay off.
- If the RESET pin is set to HIGH, it will initiate a power up sequence.

UART DC Electrical Characteristics

Units: Volts

Applies to the following pins:

Pin	Signal Name	Pin	Signal Name
J33	-RTS	J37	-DSR
J34	-RXD	J38	-CTS
J35	-TXD	J39	-DCD
J36	-RI	J40	-DTR

Parameter	Minimum	Maximum
3.3 Volt Powered		
Input Low Level	0	0.55
Input High Level	1.5	3.3
Output Low Level	0	0.55
Output High Level	2.35	3.3
5 Volt Powered		
Input Low Level	0	0.8
Input High Level	2.3	5
Output Low Level	0	0.55
Output High Level	3.7	5

Absolute Maximum Rating

All models can run with an input voltage of either 3.3V or 5V. The maximum voltage on any signal pin equals the input voltage.

Electrical Characteristics Other Pins

Pin	Signal Name	VIL Min	VIL Max	VIH Min	VIH Max	VOL Min	VOL Max	VOH Min	VOH Max
J24	-RESET	--	0.8	2.0	--	--	--	--	--
J25	USB VBUS	-0.3	0.8	2.0	8.7	--	--	--	--
J26	GND	--	--	--	--	--	--	--	--
J27	USB DP	--	0.8	2	--	--	0.3	2.8	--
J28	USB DN	--	0.8	2	--	--	0.3	2.8	--
J41	GND	--	--	--	--	--	--	--	--
J58	-LED LINK	--	--	--	--	0	0.45	2.85	3.3
J61	VCC	--	--	--	--	--	--	--	--
J63	GND	--	--	--	--	--	--	--	--

Pinout Specifications

Pin	Signal Name	Logic Level Voltage[1]	In/Out	Description
J24	–RESET	3.3 – 5.0	Input with 47KΩ pull-up	Device reset (active low)
J25	USB VBUS	3.3 – 5.0	Input with 47KΩ pull-down	USB power supply input
J26	GND	GND	N/A	Ground
J27	USB DP	3.3	3.3V I/O	USB data
J28	USB DN	3.3	3.3V I/O	USB data
J33	–RTS	5.0	Input with 47KΩ pull-down	Request to send (active low)
J34	–RXD	5.0	Output with 47KΩ pull-up	Received data (active low)
J35	–TXD	5.0	Input with 47KΩ pull-down	Transmitted data (active low)
J36	–RI	5.0	Output with 47KΩ pull-up	Ring indicator (active low)
J37	–DSR	5.0	Output with 47KΩ pull-up	Data set ready (active low)

Pin	Signal Name	Logic Level Voltage[1]	In/Out	Description
J38	–CTS	5.0	Output with 47KΩ pull-up	Clear to send (active low)
J39	–DCD	5.0	Output with 47KΩ pull-up	Data carrier detect (active low)
J40	–DTR	5.0	Input with 47KΩ pull-down	Data terminal ready (active low)
J41	GND	GND	N/A	Ground
J58	–LED LINK	3.3	Open Drain	Link status (active low, can sink up to 150mA)
J61	VCC	5.0	Power	DC input power
J63	GND	GND	N/A	Ground

[1] A hyphen (-) indicates a range of acceptable logic levels.

Note: Except for RESET, connect unused I/O pins to GND. If RESET is unused, connect it to VCC

Pin Availability by Build

Pin	Signal Name	Serial Only	USB Only
J24	–RESET	X	X
J25	USB VBUS		X
J26	GND	X	X
J27	USB DP		X
J28	USB DN		X
J33	–RTS	X	
J34	–RXD	X	
J35	–TXD	X	
J36	–RI	X	
J37	–DSR	X	
J38	–CTS	X	
J39	–DCD	X	
J40	–DTR	X	
J41	GND	X	X
J58	–LED LINK		X
J61	VCC	X	X
J63	GND	X	X

Power Measurements

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

Note:

The following notes apply to the following tables.

- **Tx Pulse:** The average peak current during an LTE connection.
- **Maximum Power:** The continuous current during maximum data rate with the radio transmitter at maximum power.
- **Inrush Charge:** The input current during power up, or a reset.

MTSMC-MNG6 Power Draw

Note: This table has been split for readability.

Radio Protocol	Sleep Mode Current CFUN=5 (If Applicable) (Amps)	PSM Mode (CPSMS)	eDRX Mode	eDRX Mode w/CFUN=5	Cellular Connection Idle (No Data) (Amps)
3.3 Volts					
GSM850	N/A	N/A	N/A	N/A	33 mA
LTE Band 5 836.5Mhz	30 mA	22 mA	31 mA	26 mA	30 mA
5.0 Volts					
GSM850	N/A	N/A	N/A	N/A	30 mA
LTE Band 5 836.5Mhz	23 mA	20 mA	26 mA	22 mA	28 mA

Radio Protocol	(AVG) Measured Current at Max Power	TX Pulse (Avg) Amplitude CurrentPeak Current for LTE	Total Inrush Charge Measured in Millicoulombs	Total Inrush Charge Duration during Power Up
3.3 Volts				
GSM850	271 mA	2.0 A	0.400 mC	2.65 mS
LTE Band 5 836.5Mhz	440 mA	1.10 A	0.400 mC	2.65 mS
5.0 Volts				
GSM850	318 mA	1.91 A	0.300 mC	2.98 mS
LTE Band 5 836.5Mhz	265 mA	968 mA	0.300 mC	2.98 mS

Note:

- Multi-Tech Systems, Inc. recommends that you incorporate a 10% buffer into the power source when determining product load.
- **Tx Pulse:** The average peak current during a GSM850 transmission burst period or HSDPA/LTE connection. The transmission burst duration for GSM850 can vary, depending on what transmission scheme is being deployed (GPRS Class 8, Class 10, GSM, etc.).
- **Maximum Power:** The continuous current during maximum data rate with the radio transmitter at maximum power
- **Inrush Charge:** The total inrush charge at power on.
- **eDRX Mode Used:** Average current will be lower if a longer eDRX Period time is used. An eDRX Period time of 81.9 seconds was used , with a 20 second paging time (AT#CEDRXS=2,4,"0101","0111"). Issue AT#CEDRXS? command to view network supplied parameters.

MTSMC-MNG6-U Power Draw

Note: This table has been split for readability.

Radio Protocol	Sleep Mode Current CFUN=0 (If Applicable) (Amps)	PSM Mode (CPSMS)	eDRX Mode	eDRX Mode w/CFUN=5	Cellular Connection Idle (No Data) (Amps)
3.3 Volts					
GSM850	N/A	N/A	N/A	N/A	49 mA
LTE Band 5 836.5Mhz	N/A	22 mA	48 mA	N/A	50 mA
5.0 Volts					
GSM850	N/A	N/A	N/A	N/A	42 mA
LTE Band 5 836.5Mhz	N/A	18 mA	37 mA	N/A	39 mA

Radio Protocol	(AVG) Measured Current (Amps) at Max Power	TX Pulse (Avg) Amplitude Current (Amps) Peak Current for LTE	Total Inrush Charge Measured in Millicoulombs	Total Inrush Charge Duration during Power Up (Inrush duration)
3.3 Volts				
GSM850	287 mA	2.5 A	0.281 mC	2.86 mS
LTE Band 5 836.5Mhz	432 mA	1.07 A	0.281 mC	2.86 mS
5.0 Volts				
GSM850	320 mA	1.83 A	0.293 mC	2.46 mS
LTE Band 5 836.5Mhz	289 mA	628 mA	0.293 mC	2.46 mS

Note:

- **Tx Pulse:** The average peak current during a GSM850 transmission burst period or HSDPA/LTE connection. The transmission burst duration for GSM850 can vary, depending on what transmission scheme is being deployed (GPRS Class 8, Class 10, GSM, etc.).
- **Maximum Power:** The continuous current during maximum data rate with the radio transmitter at maximum power.
- **Inrush Charge:** The total inrush charge at power on.
- **eDRX Mode Used:** Average current will be lower if a longer eDRX Period time is used. An eDRX Period time of 81.9 seconds was used , with a 20 second paging time (AT#CEDRXS=2,4,"0101","0111"). Issue AT#CEDRXS? command to view network supplied parameters.

Mounting Hardware

The board has three mounting holes at corners. Use #4 or M3 hardware for mounting the SocketModem to the board. Refer to *Dimensions* for more information.

Recommended Parts

Manufacturer	Part	Part Number
PEM (Penn Engineering & Manufacturing)	Surface Mount Standoff	SMTSO-M3-4ET
RAF Electronic Hardware	3/16" Hex Female Standoff	2051T-440-S-12-Zinc
RAF Electronic Hardware	4.5mm Hex Female Standoff	1251-3005-S-12-Zinc

Chapter 4 Antennas

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 that the performance is not compromised. Devices were approved with the antenna(s) described below and for alternate antennas meeting the given specifications.

The antenna system is defined as the U.FL connection point from the device to the specified cable specifications and specified antenna specifications.

The antenna system is defined as the SMA connection point from the device to the specified cable specifications and specified antenna specifications.

Requirements for Cellular Antennas with regard to FCC/IC Compliance

This device has been designed to operate with the antennas listed below and having a maximum antenna gain of 6.18 dBi for the 700 MHz band, 6.00 dBi for 1700 MHz band, and 9.01 dBi for the 1900 MHz frequency band. Antennas not included in this list or that have a gain greater than specified are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

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

Category	Description
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)

Chapter 5 Carrier Specific Notice

Firmware Over the Air (FOTA) for Verizon

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 Getting Started

Before Using the Device

Before using the device:

- Get a SIM card from your network provider. Refer to SIM Card and Account Activation
- Install the SIM card on your device. Refer to Installing a SIM Card on a SocketModem Cell
- Attach antennas and cable the hardware. If using with the developer board, refer to the *Universal Developer Kit Developer Guide* for details.
- Install drivers. Refer to Device Drivers
- Install terminal software that can communicate with the device, such as HyperTerminal, Tera Term, 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.

  To verify the device is connected, enter AT in the terminal program. The device responds with OK.

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.

SIM Card and Account Activation

To use the device, set up a wireless account with your network provider:

1. Contact your network provider to obtain an account and a SIM card for their network. This device requires a mini SIM (2FF).
2. Give the provider the following:

   a. The device's unique 15-character IMEI number located on the device label.
   b. The device model number, also located on the device label. This number allows the carrier to verify that the device is approved for operation on their network.

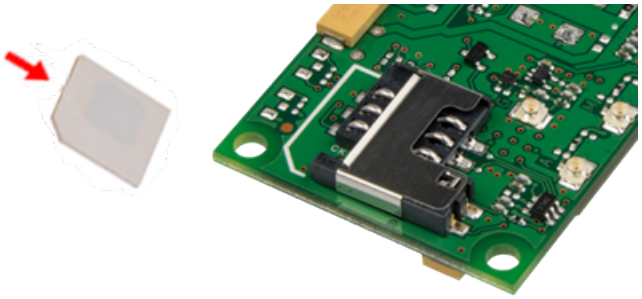
   Important: Check your product's label for the correct information to provide your wireless carrier. Provide the model number (not the ordering part number) listed on the label.
3. Follow your provider's instructions for activating their SIM card on their network.

Installing a SIM Card on a SocketModem Cell

Note: When using the SocketModem Cell with a developer board, mount the SocketModem Cell on the developer board before installing the SIM card.

To install the SIM Card:

- With the contact side facing down, align the notched edge as outlined on the SocketModem Cell and slide the SIM card completely into the SIM holder.



Device Drivers

Install drivers on your computer before connecting the device.

The cellular radio's USB device driver is available on your model's page.

- Go to https://www.multitech.com/brands/socketmodem-cell and click on your model. Download the driver from Downloads.
- The USB Driver Installation Guide (S000616) is included in the driver download and is also available under Manuals on your model's page.

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
```

Configuring a Data Connection

Configure the device before making a cellular data connection. Configuration changes are saved automatically.

Note: Configure the data connection when initially setting up the device, when changing SIM card, or if recommended by your carrier.

Configuring Packet Data Protocol

Use a Packet Data Protocol (PDP) context to configure the device to use your carrier's packet data services. Multiple PDP contexts are stored in an ordered list. Generally, a carrier approves only one PDP context in the list to configure and use for a data connection with their network.

To view the current PDP context list use the following AT command:

```
AT+CGDCONT?`
```

Example

```
AT+CGDCONT?
+CGDCONT: 1,"IPV4V6","","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
+CGDCONT: 2,"IPV4V6","vzwadmin","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
+CGDCONT:
3,"IPV4V6","vzwinternet","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
+CGDCONT: 4,"IPV4V6","vzwapp","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
+CGDCONT: 5,"IPV4V6","vzwclass6","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
+CGDCONT: 6,"IPV4V6","vzwiotts","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0

OK`
```

Before configuring a PDP context use the following to stop the device from automatically connecting to the cellular network and registering:

```
AT+COPS=2
```

After configuring the PDP context(s) use the following to resume automatic connection and registration:

```
AT+COPS=0
```

Configuring APN

The Access Point Name (APN) is a string in the PDP context that defines the network path for cellular data connectivity. The APN must match the carrier's value provided with the SIM

Configuring Verizon APN

Verizon automatically pushes the necessary PDP context details, including the APN, to the device. If the APN is not pushed automatically, use the following AT commands to set the APN.

```
AT+COPS=2
AT+CGDCONT=1,"IPV4V6","<APN>"
AT+COPS=0
```

Where < APN> is the APN Verizon provided with the SIM.

Verizon Example

```
AT+COPS=2
OK
AT+CGDCONT=1,"IPV4V6","mw01.vzwstatic"
OK
AT+COPS=0
OK
```

Configuring APN for AT&T and Other Networks

AT&T and other networks may not pushes PDP context details, including the APN, to the device. Use the following AT commands to set the APN.

```
AT+COPS=2
AT+CGDCONT=1,"IPV4V6","<APN>"
AT+COPS=0
```

Where <APN> is the APN your carrier provided with the SIM.

AT&T Example

```
AT+COPS=2
OK
AT+CGDCONT=1,"IPV4V6","broadband"
OK
AT+COPS=0
OK
```

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
```

Testing Cellular Data

Once the device is configured and registered with the cellular network, activate a PDP context and conduct a ping test to ensure the device is sending and receiving data.

Activating a PDP Context

Before sending data, activate a carrier specific PDP context with the following.

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

Example

```
AT#SGACT=1,1
#SGACT: 100.72.154.34,38.0.16.20.176.134.63.233.0.0.0.0.187.242.184.1

OK
```

Conducting a Ping Test

After activating the PDP context, use AT#PING to verify network connectivity.

```
AT#PING="<Domain or IP Address>"
```

Example:

```
AT#PING="8.8.8.8"
#PING: 01,"8.8.8.8",0,114
#PING: 02,"8.8.8.8",0,114
#PING: 03,"8.8.8.8",1,114
#PING: 04_Cel,"8.8.8.8",2,114

OK
```

Chapter 7 Safety Information

Handling Precautions

To avoid damage due to the accumulation of static charge use proper precautions, such as an ESD strap, when handling any cellular device to avoid exposure to electronic discharge during handling and mounting the device.

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.
- Turn off your wireless device when in an aircraft. Using portable electronic devices in an aircraft may endanger aircraft operation, disrupt the cellular network, and may be illegal. Failing to observe this restriction may lead to suspension or denial of cellular services to the offender, legal action, or both.
- Turn off your wireless device when around gasoline or diesel-fuel pumps and before filling your vehicle with fuel.
- Turn off your wireless device in hospitals and any other place where medical equipment may be in use.

Sécurité relative aux appareils à radiofréquence (RF)

À cause du risque d'interférences de radiofréquence (RF), il est important de respecter toutes les réglementations spéciales relatives aux équipements radio. Suivez les conseils de sécurité ci-dessous.

- Utiliser l'appareil à proximité d'autres équipements électroniques peut causer des interférences si les équipements ne sont pas bien protégés. Respectez tous les panneaux d'avertissement et les recommandations du fabricant.
- Certains secteurs industriels et certaines entreprises limitent l'utilisation des appareils cellulaires. Respectez ces restrictions relatives aux équipements radio dans les dépôts de carburant, dans les usines de produits chimiques, ou dans les zones où des dynamitages sont en cours. Suivez les restrictions relatives à chaque type d'environnement où vous utiliserez l'appareil.
- Ne placez pas l'antenne en extérieur.
- Éteignez votre appareil sans fil dans les avions. L'utilisation d'appareils électroniques portables en avion est illégale: elle peut fortement perturber le fonctionnement de l'appareil et désactiver le réseau cellulaires. S'il ne respecte pas cette consigne, le responsable peut voir son accès aux services cellulaires suspendu ou interdit, peut être poursuivi en justice, ou les deux.

- Éteignez votre appareil sans fil à proximité des pompes à essence ou de diesel avant de remplir le réservoir de votre véhicule de carburant.
- Éteignez votre appareil sans fil dans les hôpitaux ou dans toutes les zones où des appareils médicaux sont susceptibles d'être utilisés.

Interference with Pacemakers and Other Medical Devices

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 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).

Vehicle Safety

When using your device in a vehicle:

- Do not use this device while driving.
- Respect local regulations on the use of cellular devices in vehicles.
- If incorrectly installed in a vehicle, operating the wireless device could interfere with the vehicle’s electronics. To avoid such problems, use qualified personnel to install the device. The installer should verify that the vehicle electronics are protected from interference.
- Using an alert device to operate a vehicle’s lights or horn is not permitted on public roads.
- UL evaluated this device for use in ordinary locations only. UL did *not* evaluate this device for installation in a vehicle or other outdoor locations. UL certification does not apply or extend to use in vehicles or outdoor applications.

Operation Safety

CAUTION: Read all instructions and safety information before installing or using this device.

Attention: Lisez toutes les instructions et consignes de sécurité avant d'installer ou d'utiliser cet appareil.

- Follow all local laws, regulations, and rules for operating a wireless device.
- Use the device security features to block unauthorized use and theft.
- Unless otherwise noted, antennas are not approved for outdoor use. Do not extend any antenna outside of any building, dwelling, or campus.
- Do not attempt to disassemble the device. There are no user-serviceable parts inside.
- Do not misuse the device. Follow instructions on proper operation and only use as intended. Misuse could make the device inoperable, damage the device or other equipment, or harm users.
- Do not apply excessive pressure or place unnecessary weight on the device. This could result in damage to the device or harm to users.
- Do not use this device in explosive or hazardous environments unless the model is specifically approved for such use. The device may cause sparks. Sparks in explosive areas could cause an explosion or fire that may result in property damage, severe injury, or death.
- Do not expose the device to any extreme environment where the temperature or humidity is high. Such exposure could result in damage to the device or cause a fire. See the device specifications for recommended operating temperature and humidity.
- Do not expose the device to water, rain, or other liquids. It is not waterproof. Exposure to liquids could result in damage to the device.
- Using accessories, such as antennas, that MultiTech has not authorized or that are not compliant with the device accessory specifications may invalidate the warranty.

If the device is not working properly, contact MultiTech technical support.

Chapter 8 Labels

Approvals and Certifications

This device is an industry and/or carrier approved modem. In most cases, when integrated and used with an antenna system that was part of the MultiTech modem certification, additional approvals or certifications are not required for the device that you develop as long as the following requirements are met:

- **PTCRB Requirements:** The antenna system cannot be altered. The antenna system must be the same type with similar in-band and out-of-band radiation patterns and maintain the same specifications. Refer to the FCC grant information for details.
- **Model Identification:** The MultiTech model identification allows the carrier to verify the modem as one of its approved models. This information is located on the modem's label below the bar code.

Example Labels

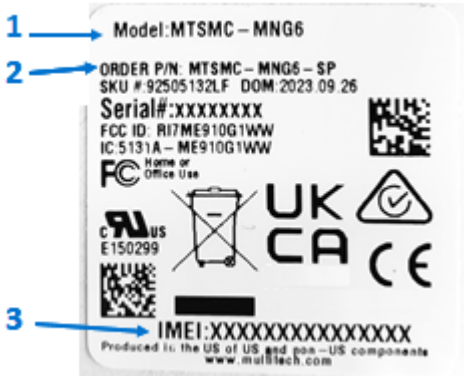
Note: Actual labels vary depending on the regulatory approval markings and content.

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.

The label shown is not than actual size.

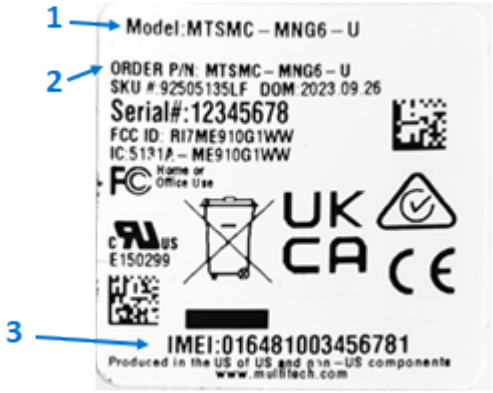
1. MultiTech Model Identification
2. MultiTech Ordering Part Number
3. IMEI (International Mobile Equipment Identity).

MTSMC-MNG6 Device



Label

MTSMC-MNG6-U Device



Label

MTSMC-MNG6 Package Label

MTSMC-MNG6-U Package Label

Chapter 9 Regulatory Information

FCC 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.

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.

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

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.

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

CE 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/.

EU EMC, Safety, and Radio Equipment Regulations (UKCA)

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

UK CA

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://multitech.com/product-support/.

Australia Regulatory Compliance Mark (RCM)

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 10 Environmental Notices

EU WEEE Directive

Note: This statement may be used in documentation for your final product applications.

The Waste from Electrical and Electronic Equipment (WEEE) Directive places an obligation on EU-based manufacturers, distributors, retailers, and importers to take back 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

EU REACH-SVHC Statement

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, go to https://multitech.com/approvals-and-certifications/.

EU RoHS 3 Directive

Multi-Tech Systems, Inc. confirms that all products comply with the chemical concentration limitations set forth in the Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS 3) 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, go to https://multitech.com/approvals-and-certifications/.

Chapter 11 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. See Connecting a Device.

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

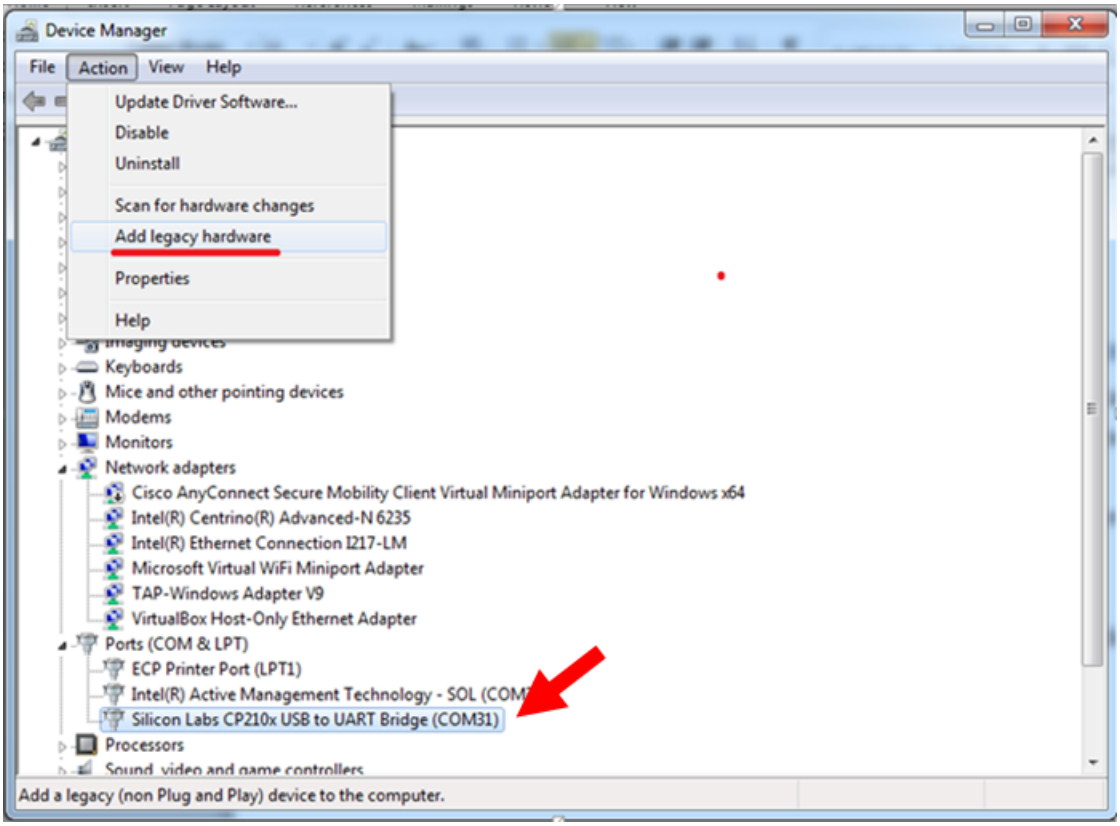
Setting Up a Serial Device in Windows Device Manager

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, see Connecting a Device.

Connecting a Device

Prerequisite:

- 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. See 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

Prerequisite:

Make sure that Connection Manager is not running.

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

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**.

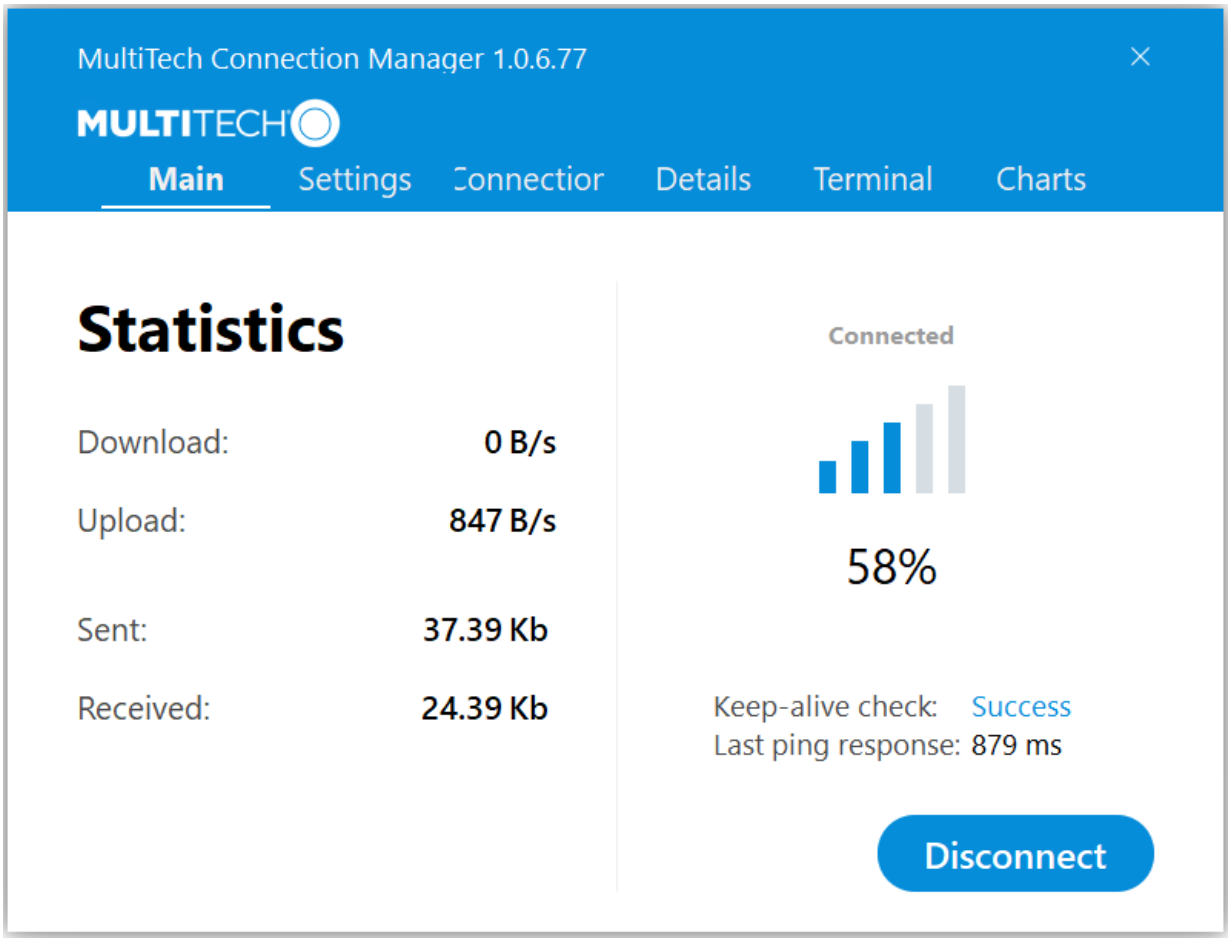
Connection Manager and the installed drivers are removed from the computer.

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



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, see 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 two-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 reinstall Connection Manager. During the installation, make sure that you check **Install the modem driver**. See Uninstalling Connection Manager and Installing Connection Manager.

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

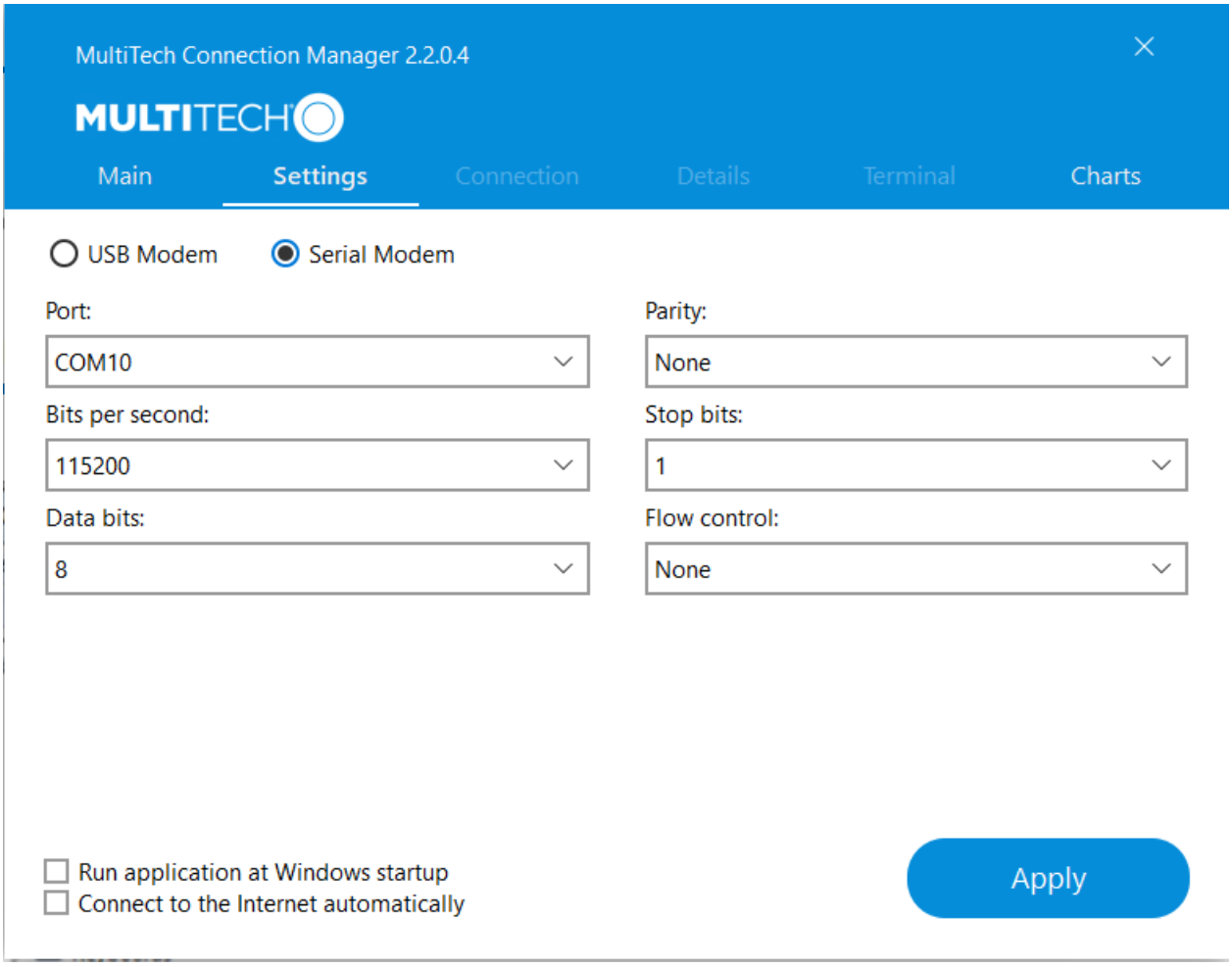
This error has the following causes and solutions.

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.

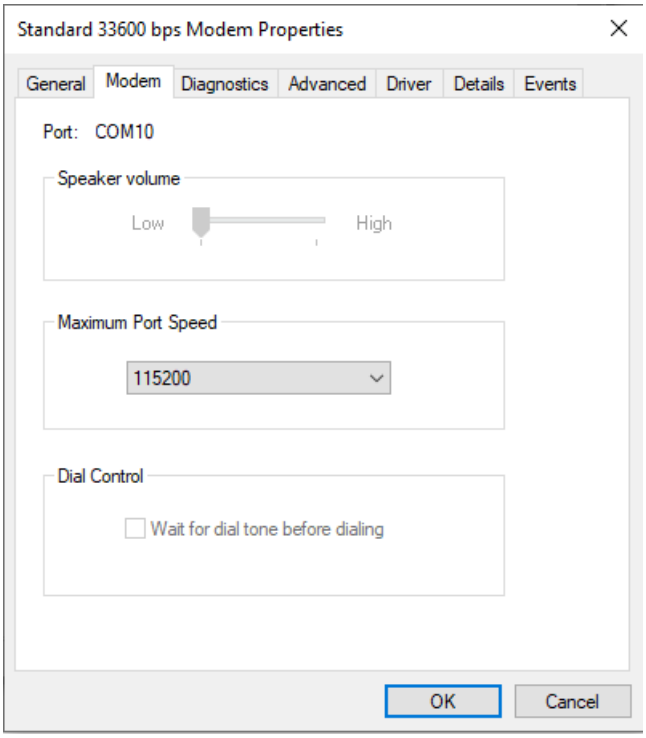
In **Connection Manager**, click the **Settings** tab.



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

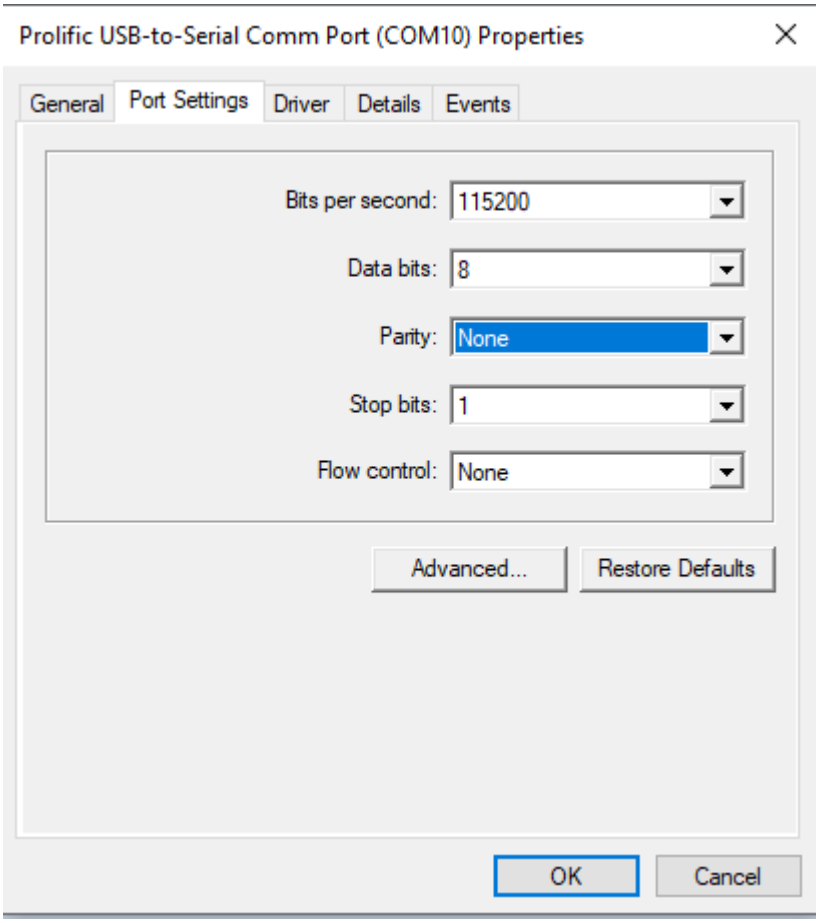
Note: If Modems and Ports don't appear in Device Manager, open the **View** Menu and select **Show hidden devices**.

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



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

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


Prolific USB-to-Serial Comm Port (COM10) Properties
General
Port Settings
Driver
Details
Events
Bits per second:
115200
Data bits:
8
Parity:
None
Stop bits:
1
Flow control:
None
Advanced...
Restore Defaults
OK
Cancel

Warranty

To read the warranty statement for your product, go to https://www.multitech.com/warranty.

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Revision History

Revision Number	Description	Revision Date
1.2	Updated information on how to power down the device and functions of the device reset pin.	March 2025
1.1	Updated power requirements.	November 2025
1.0	Original publication.	September 2023