



MultiConnect® microCell

MTCM2-L6G1 User Guide



MultiConnect microCell User Guide

Model: MTCM2-L6G1

Part Number: S000752 1.2

Copyright

This publication may not be reproduced, in whole or in part, without the specific and express prior written permission signed by an executive officer of Multi-Tech Systems, Inc. All rights reserved. **Copyright © 2020 by Multi-Tech Systems, Inc.**

Multi-Tech Systems, Inc. makes no representations or warranties, whether express, implied or by estoppels, with respect to the content, information, material and recommendations herein and specifically disclaims any implied warranties of merchantability, fitness for any particular purpose and non-infringement.

Multi-Tech Systems, Inc. reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of Multi-Tech Systems, Inc. to notify any person or organization of such revisions or changes.

Trademarks

MultiTech®, the MultiTech logo, and MultiConnect are registered trademarks of Multi-Tech Systems, Inc. All other brand and product names are trademarks or registered trademarks of their respective companies.

Legal Notices

The MultiTech products are not designed, manufactured or intended for use, and should not be used, or sold or re-sold for use, in connection with applications requiring fail-safe performance or in applications where the failure of the products would reasonably be expected to result in personal injury or death, significant property damage, or serious physical or environmental damage. Examples of such use include life support machines or other life preserving medical devices or systems, air traffic control or aircraft navigation or communications systems, control equipment for nuclear facilities, or missile, nuclear, biological or chemical weapons or other military applications ("Restricted Applications"). Use of the products in such Restricted Applications is at the user's sole risk and liability.

The MultiTech products and the final application of the MultiTech products should be thoroughly tested to ensure the functionality of the MultiTech products as used in the final application. The designer, manufacturer and reseller has the sole responsibility of ensuring that any end user product into which the MultiTech product is integrated operates as intended and meets its requirements or the requirements of its direct or indirect customers. MultiTech has no responsibility whatsoever for the integration, configuration, testing, validation, verification, installation, upgrade, support or maintenance of such end user product, or for any liabilities, damages, costs or expenses associated therewith, except to the extent agreed upon in a signed written document. To the extent MultiTech provides any comments or suggested changes related to the application of its products, such comments or suggested changes is performed only as a courtesy and without any representation or warranty whatsoever.

Contacting MultiTech

Knowledge Base

The Knowledge Base provides immediate access to support information and resolutions for all MultiTech products. Visit <http://www.multitech.com/kb.go>.

Support Portal

To create an account and submit a support case directly to our technical support team, visit: <https://support.multitech.com>.

Support

Business Hours: M-F, 8am to 5pm CT

Country	By Email	By Phone
Europe, Middle East, Africa:	support@multitech.co.uk	+(44) 118 959 7774
U.S., Canada, all others:	support@multitech.com	(800) 972-2439 or (763) 717-5863

Warranty

To read the warranty statement for your product, visit <https://www.multitech.com/legal/warranty>. For other warranty options, visit www.multitech.com/es.go.

World Headquarters

Multi-Tech Systems, Inc.
2205 Woodale Drive, Mounds View, MN 55112
Phone: (800) 328-9717 or (763) 785-3500
Fax (763) 785-9874

Contents

Chapter 1 – Product Overview	5
About the MultiConnect microCell Modem	5
Documentation Overview	5
Dimensions.....	6
MTCM2-L6G1 Specifications	7
MTCM2-L6G1 Power Draw	8
Side Panels and Connectors.....	8
Side Panels	8
Connectors	8
LED Descriptions	9
Additional Signal LED Information	10
Chapter 2 – Safety Warnings.....	11
Radio Frequency (RF) Safety	11
Sécurité relative aux appareils à radiofréquence (RF).....	11
Interference with Pacemakers and Other Medical Devices	12
Potential interference	12
Precautions for pacemaker wearers	12
Chapter 3 – Installing Drivers	13
Installing on Linux	13
Installing Windows Drivers	13
Uninstall driver before installing update	14
Chapter 4 – Installing the Device.....	15
Installing a SIM Card	15
Removing a SIM Card	15
Installing the Device	15
Connecting to a CBRS Network.....	15
Basic AT Commands.....	15
Troubleshooting the Connection	16
Chapter 5 – Antenna Information	17
Antenna.....	17
Antenna System Devices.....	17
CBRS Antenna	17
Antenna Specifications.....	17
Chapter 6 – Regulatory Information.....	18
47 CFR Part 15 Regulation Class B Devices	18
FCC Interference Notice	18
Industry Canada Class B Notice.....	18

Waste Electrical and Electronic Equipment Statement	18
WEEE Directive	19
Instructions for Disposal of WEEE by Users in the European Union	19
REACH Statement	19
Registration of Substances.....	19
Restriction of the Use of Hazardous Substances (RoHS)	20
Information on HS/TS Substances According to Chinese Standards	21
Information on HS/TS Substances According to Chinese Standards (in Chinese)	22
Chapter 7 – Using Connection Manager	23
Installing Connection Manager	23
Setting Up a Serial Device in Windows Device Manager	24
Connecting a Device.....	26
Uninstalling Connection Manager.....	27
Connection Manager User Interface.....	28
Main tab.....	28
Settings tab	29
Connection tab.....	29
Details tab	29
Terminal tab.....	29
Charts tab.....	29
Troubleshooting	30
Serial COM port is not available in the Serial Modem Settings.....	30
Device is not detected ("No Device")	30
MultiConnect Cell USB Modem is not detected	30
Connection Manager is not working, and a device connected to the computer is not detected.....	30
Connection Manager displays "Device Error" status for a serial device	30

Chapter 1 – Product Overview

About the MultiConnect microCell Modem

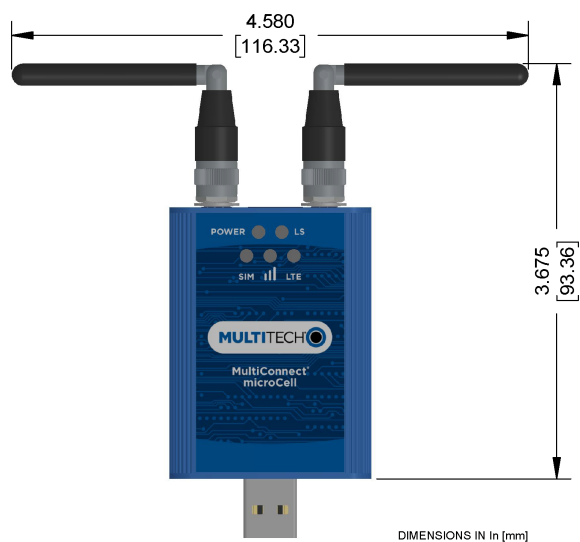
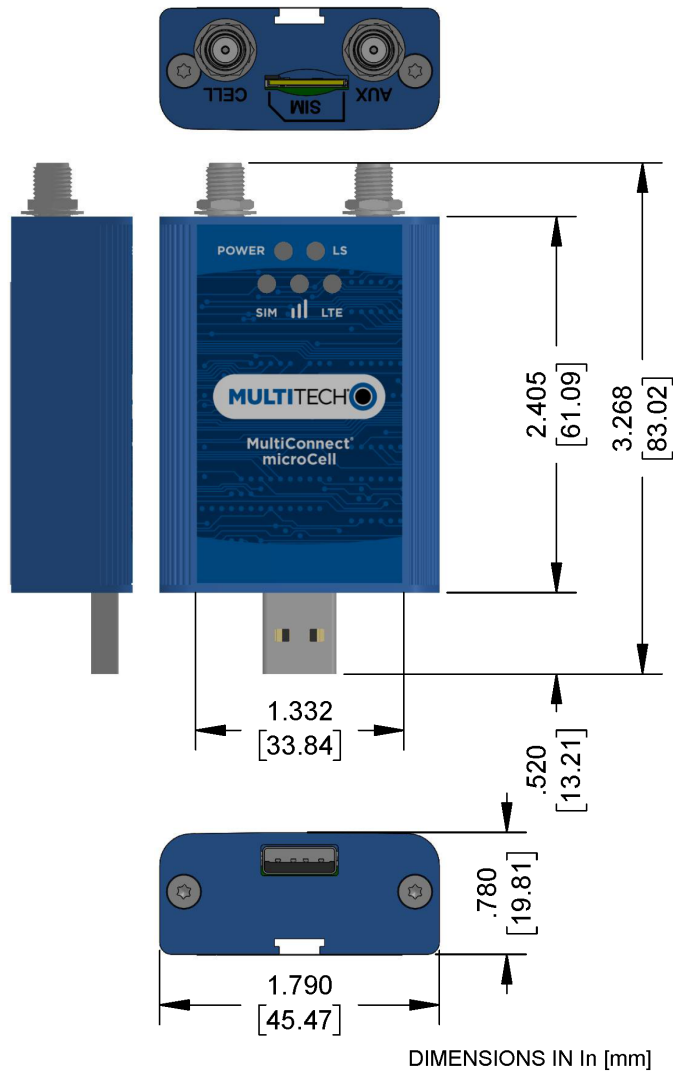
The MultiConnect microCell is a compact and simple communications platform that provides CBRS capabilities for fixed and mobile applications. It is intended for use in settings such as vending, smart parking, medical, smart inventory tracking equipment and commercial applications.

Documentation Overview

The following documents are available at <https://www.multitech.com/brands/multiconnect-microcell>. Select your model to find the documents specific for that device.

Document	Description	Part Number
MultiConnect microCell MTCM2-L6G1 User Guide	Hardware, regulatory, and getting started information.	S000752
MultiConnect microCell MTCM2-L6G1 Quick Start	Steps for getting started. Ships with the device and is available online.	82105000L
Sequans Cassiopeia AT Commands Manual	Lists AT Commands and parameters used to communicate with your device.	N/A
Cassiopeia Module Use Cases with AT Commands	Provides AT Command use cases	N/A

Dimensions



DIMENSIONS IN In [mm]

MTCM2-L6G1 Specifications

Category	Description
General	
Standards	3GPP E-UTRA Release 10
	USB Interface is CDC-ACM and CDC-ETHER compliant
TCP/IP Functions	FTP, SMTP, SSL, UDP
Frequency Bands	LTE: B42/B43
	CBRS: B48
Speed	
Data Speed	LTE: Max 200Mbps (DL)/Max 15Mbps (UL)
Physical Description	
Weight	Device only 2.4 oz (66 g); With antennas 2.9 oz (83 g)
Dimensions	Refer to <i>Dimensions</i> for dimensions.
Connectors	
Antenna Connector	2 SMA connectors
SIM	1.8V and 3V SIM holder for micro-SIM (3FF) card
USB	USB 2.0 with High Speed up to 480 Mbps
Environment	
Operating Temperature	-30° C to +60° C*
Storage Temperature	-40° C to +85° C
Operating Humidity	10%-85% RH, non-condensing
Storage Humidity	5%-85% RH, non-condensing
Power Requirements	
Operating Voltage	USB Model: 5 VDC
SMS	
SMS	Point-to-Point messaging
	Mobile-Terminated SMS
	Mobile-Originated SMS
Certifications and Compliance	
EMC and Radio Compliance	FCC Part 15B
	FCC Part 96.47
Safety Compliance	UL/cUL 62368-1

*UL tested to ambient temperature of +60C.

MTCM2-L6G1 Power Draw

Note: MultiTech recommends that you incorporate a 10% buffer into your power source when determining product load.

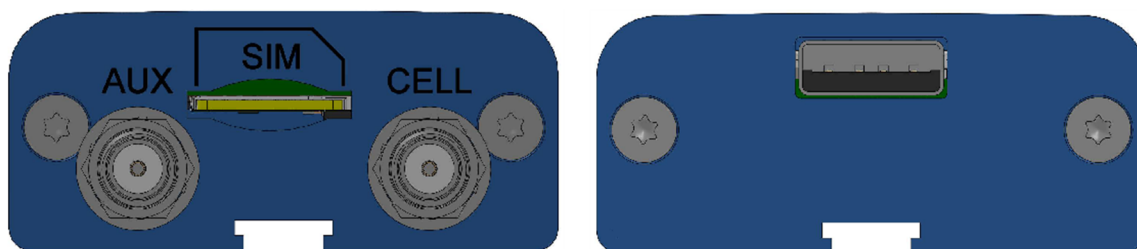
Radio Protocol	3G On/Off Mode Current or Sleep Mode	Live Connection, Idle Current	Average Measured Current at Max Power ¹	TX Pulse Amplitude Current for Peak Current ²	Total Inrush Charge ³	Total Inrush Duration During Power Up
5 Volts USB						
LTE Band 43 (3700Mhz)	N/A	N/A	477 mA	784 mA	0.135 mC	22.1 uS
LTE Band 42 (3500Mhz)	N/A	N/A	482 mA	792 mA	0.135 mC	22.1 uS
LTE Band 48 (3625Mhz)	N/A	173 mA	473 mA	768 mA	0.135 mC	22.1 uS

Note:

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

Side Panels and Connectors

Side Panels



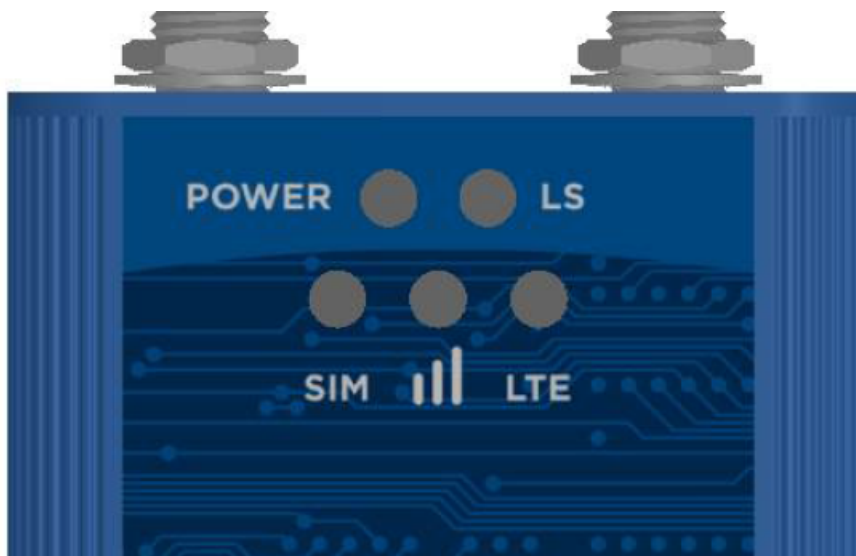
Connectors

The device has the following connectors:

- **USB** 1 USB connector
- **SMA** 2 female SMA connectors, labeled CELL and AUX
- **SIM** 1 micro-SIM slot, between the SMA connectors


LED Descriptions

The MTCM2 has the following LEDs:



Note:

- Slow is 1 second on 1 second off
- Fast is 200 milliseconds on 200 milliseconds off

LED	Status	Description
Power	On	Device has power
	Off	Device does not have power
Link Status (LS)	On	Radio is not registered
	Flash Slow	Registered
	Off	Radio is turned off, in PSM mode, receiving a firmware update, or SIM is not inserted.
LTE	On	LTE
	Off	SIM not inserted or radio technology unknown
SIM	On	Ready
	Flash Slow	Other
	Off	SIM not inserted
Signal Strength 	On	Good
	Flash Fast	Fair
	Flash Slow	Poor
	Off	Too low for communication or SIM not inserted.

Additional Signal LED Information

Signal LED is based on +CESQ RSRP and RSRQ:

	RSRP	RSRQ
On	-90	-10+
Fast	-105	-11 to -15
Slow	-120	-16 to -19
Off	< -120	< -19

Chapter 2 – 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 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 network, and is illegal. Failing to observe this restriction may lead to suspension or denial of 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.

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. 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. S'il ne respecte pas cette consigne, le responsable peut voir son accès aux services 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

Potential interference

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

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

Precautions for pacemaker wearers

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

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

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

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

Chapter 3 – Installing Drivers

Installing on Linux

The MTCM2-L6G1 is plug-and-play on Linux systems.

- Linux Ubuntu 12.04 LTS and 14.04 LTS
- Linux Ubuntu 14.04 LTS

After modem hardware is installed, Linux system should show these ports:

- One com port = CDC_ACM (/dev/ttyACM0)
- Two ethernet ports = CDC_ether (eth1 and eth2)

Use Linux commands below to start cellular connection after modem is setup, configured and registered:

```
ifconfig eth1 up (cellular IP)
ifconfig eth2 up (debug interface)
udhcpc -i eth1
udhcpc -i eth2
ifconfig eth1 (check if cellular IP address is assigned successfully to this ethernet interface)
```

You need to setup and configure routing, DNS and default gateway so the system has access over the private LTE network via the Ethernet cellular IP address interface

Installing Windows Drivers

CAUTION: If you connected the device before installing the drivers, Windows may install drivers automatically. Your device may not operate correctly with these drivers. Uninstall the drivers before proceeding.

The driver supports the following Windows versions:

- Windows 10
- Windows 8
- Windows 7

Before connecting your device.

1. Click on your model's page at <https://www.multitech.com/brands/multiconnect-microcell>
2. Under **Downloads**, select the sqn_setup_LR4.2.2.0-48388-usb-drivers.exe.
3. Double-click the exe file to launch the installer.
4. Click **Yes** and then click **Next**.
5. Read the license agreement. Select **I accept the agreement** and then click **Next**.
6. Select the **Installation Directory** and click **Next**. To change the default directory:
 - a. Click **Browse**.
 - b. Select a directory.
 - c. Click **OK**.
7. Select the **Start Menu Folder** name. To change the default folder:
 - a. Click **Browse**.

- b. Select a directory.
 - c. Click **OK**.
- 8. Click **Install**.
Depending your Windows version, you see a Windows Security window. Check **Always trust software from Sequans Communications** and then click **Install**.
- 9. Click **Finish**.

Uninstall driver before installing update

Note: If you previously installed USB drivers for this device, uninstall them before installing or re-installing this driver. Uninstall all existing drivers for this device. Refer to [Uninstall Windows Drivers](#) for details.

Windows 10

To uninstall drivers from Windows 10:

1. Open the Start Menu and click **Settings**.
2. Click **System**.
3. Click **Apps & Features**.
4. In the Apps & Features pane, scroll down to **Sequans 4G solution ##**, where ## is the version number, and click **Uninstall**. Confirm that you want to uninstall the driver.

Windows 8 or 8.1

To uninstall drivers from Windows 8 or 8.1:

1. Open Windows **Programs and Features**.
2. Scroll to **Sequans 4G solution ##**, where ## the version number, and click Uninstall. Confirm that you want to uninstall the driver.

Windows 7

To uninstall drivers from Windows 7:

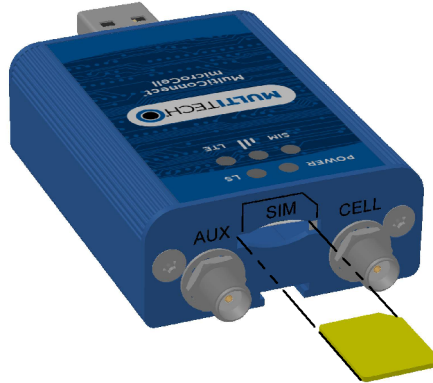
1. Open **Programs and Features** from the Windows Control Panel.
2. Scroll to **Sequans 4G solution ##**, where ## the version number, and click Uninstall. Confirm that you want to uninstall the driver.

Chapter 4 – Installing the Device

Installing a SIM Card

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

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



Removing a SIM Card

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

Installing the Device

Important: Install drivers on your computer before connecting the device.

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

Connecting to a CBRS Network

After the POWER LED lights up:

- By default auto connect is enabled so if no APN is required it will connect automatically.

If APN is Required:

1. Log into a terminal program, such as PuTTY.
2. Go to AT command port and enable echo with ATE1 by default it is disabled.
3. Set APN using AT+CGDCONT=1,"IP","APN#", where APN# is the APN for your device.

Basic AT Commands

Use terminal program, such as PuTTY, and AT command to query modem information and status

Check SIM status

```
AT+CIMI  
AT+CPIN?
```

Setup and check APN using command

```
AT+CGDCONT=1,"IP","apn name"  
AT+CGDCONT?  
AT+CGCONTRDP
```

Check signal strength

```
AT+CESQ
```

Check network registration

```
AT+CEREG?  
AT+COPS?
```

Check modem setting for auto network connection

```
AT+SQNAUTOCONNECT?  
AT^AUTOATT?
```

Troubleshooting the Connection

If the device does not connect to your network:

- Check the SIM card. Verify it is activated and allowed to connect to private LTE network.
- Does SIM card require specific APN setting? Set APN using AT commands.
- Check LED SIM to insure SIM card is detected.
- Check LED signal strength to insure network signal is available.
- Check LED LS to insure network registered.

Chapter 5 – Antenna Information

Antenna

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 and 1.1307 of the FCC rules for satisfying RF exposure compliance. If an alternate antenna is used, consult user documentation for required antenna specifications.

Antenna System Devices

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

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

CBRS Antenna

Manufacturer: 2J
Manufacturer's Model Number: 2JW1024

Antenna Specifications

Category	Description
Parameters	CBRS
Standards	CBRS
Band (MHz)	3700 MHz
Frequency Range	3550-3700 MHz
Return Loss (dB)	~-10.1
Efficiency (%)	~50.2
Impedance	50 Ohms
VSWR	VSWR should not exceed 2.0:1 at any point across the bands of operation
Peak Gain (dBi)	~0.1
Average Gain (dB)	~-3.0
Radiation	Omni-directional
Polarization	Linear
Max Input Power (W)	10
Connector	SMA(M) Standard

Chapter 6 – Regulatory Information

47 CFR Part 15 Regulation Class B Devices

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.

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 Règlement 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.

Waste Electrical and Electronic Equipment Statement

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

WEEE Directive

The 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, please contact your local city office, your household waste disposal service or where you purchased the product.

July, 2005



REACH 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

The latest **197** substances restricted per the REACH Regulation were **last updated January 2019**. Refer to the following for the most current candidate list of substances: <http://echa.europa.eu/candidate-list-table>.

Restriction of the Use of Hazardous Substances (RoHS)

Multi-Tech Systems, Inc.

Certificate of Compliance

2015/863

Multi-Tech Systems, Inc. confirms that its embedded products comply with the chemical concentration limitations set forth in the directive 2015/863 of the European Parliament (Restriction of the use of certain Hazardous Substances in electrical and electronic equipment - RoHS).

These MultiTech products do not contain the following banned chemicals¹:

- Lead, [Pb] < 1000 PPM
- Mercury, [Hg] < 100 PPM
- Cadmium, [Cd] < 100 PPM
- Hexavalent Chromium, [Cr+6] < 1000 PPM
- Polybrominated Biphenyl, [PBB] < 1000 PPM
- Polybrominated Diphenyl Ethers, [PBDE] < 1000 PPM
- Bis(2-Ethylhexyl) phthalate (DEHP): < 1000 ppm
- Benzyl butyl phthalate (BBP): < 1000 ppm
- Dibutyl phthalate (DBP): < 1000 ppm
- Diisobutyl phthalate (DIBP): < 1000 ppm

Environmental considerations:

- Moisture Sensitivity Level (MSL) =1
- Maximum Soldering temperature = 260C (in SMT reflow oven)

¹Lead usage in some components is exempted by the following RoHS annex, therefore higher lead concentration would be found in some modules (>1000 PPM);

- Resistors containing lead in a glass or ceramic matrix compound.

Information on HS/TS Substances According to Chinese Standards

In accordance with China's Administrative Measures on the Control of Pollution Caused by Electronic Information Products (EIP) # 39, also known as China RoHS, the following information is provided regarding the names and concentration levels of Toxic Substances (TS) or Hazardous Substances (HS) which may be contained in Multi-Tech Systems Inc. products relative to the EIP standards set by China's Ministry of Information Industry (MII).

Hazardous/Toxic Substance/Elements

Name of the Component	Lead (PB)	Mercury (Hg)	Cadmium (CD)	Hexavalent Chromium (CR6+)	Polybrominated Biphenyl (PBB)	Polybrominated Diphenyl Ether (PBDE)
Printed Circuit Boards	O	O	O	O	O	O
Resistors	X	O	O	O	O	O
Capacitors	X	O	O	O	O	O
Ferrite Beads	O	O	O	O	O	O
Relays/Opticals	O	O	O	O	O	O
ICs	O	O	O	O	O	O
Diodes/ Transistors	O	O	O	O	O	O
Oscillators and Crystals	X	O	O	O	O	O
Regulator	O	O	O	O	O	O
Voltage Sensor	O	O	O	O	O	O
Transformer	O	O	O	O	O	O
Speaker	O	O	O	O	O	O
Connectors	O	O	O	O	O	O
LEDs	O	O	O	O	O	O
Screws, Nuts, and other Hardware	X	O	O	O	O	O
AC-DC Power Supplies	O	O	O	O	O	O
Software /Documentation CDs	O	O	O	O	O	O
Booklets and Paperwork	O	O	O	O	O	O
Chassis	O	O	O	O	O	O

X Represents that the concentration of such hazardous/toxic substance in all the units of homogeneous material of such component is higher than the SJ/Txxx-2006 Requirements for Concentration Limits.

O Represents that no such substances are used or that the concentration is within the aforementioned limits.

Information on HS/TS Substances According to Chinese Standards (in Chinese)

依照中国标准的有毒有害物质信息

根据中华人民共和国信息产业部 (MII) 制定的电子信息产品 (EIP) 标准—中华人民共和国《电子信息产品污染控制管理办法》（第 39 号），也称作中国 RoHS, 下表列出了 Multi-Tech Systems, Inc. 产品中可能含有的有毒物质 (TS) 或有害物质 (HS) 的名称及含量水平方面的信息。

有害/有毒物质/元素

成分名称	铅 (PB)	汞 (Hg)	镉 (CD)	六价铬 (CR6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板	O	O	O	O	O	O
电阻器	X	O	O	O	O	O
电容器	X	O	O	O	O	O
铁氧体磁环	O	O	O	O	O	O
继电器/光学部件	O	O	O	O	O	O
ICs	O	O	O	O	O	O
二极管/晶体管	O	O	O	O	O	O
振荡器和晶振	X	O	O	O	O	O
调节器	O	O	O	O	O	O
电压传感器	O	O	O	O	O	O
变压器	O	O	O	O	O	O
扬声器	O	O	O	O	O	O
连接器	O	O	O	O	O	O
LEDs	O	O	O	O	O	O
螺丝、螺母以及其它五金件	X	O	O	O	O	O
交流-直流电源	O	O	O	O	O	O
软件/文档 CD	O	O	O	O	O	O
手册和纸页	O	O	O	O	O	O
底盘	O	O	O	O	O	O

X 表示所有使用类似材料的设备中有害/有毒物质的含量水平高于 SJ/Txxx-2006 限量要求。

O 表示不含该物质或者该物质的含量水平在上述限量要求之内。

Chapter 7 – Using Connection Manager

Use Connection Manager to:

- Install the latest device drivers.
- Activate and 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, Sprint, and some regional carriers. If you cannot activate your device with Connection Manager, refer to *Account Activation for Cellular Devices*.
- MTD-H5 models use SIM-based activation. If you do not have a SIM card, contact your carrier.
- 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.

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://www.multitech.com/support/connection-manager>.
2. Click **Connection Manager**.
3. Open or unzip the **Connection Manager** file and run the installer (.msi file).
4. In the MultiTech Connection Manager Setup Wizard, read the end-user license agreement and check **I accept the terms in the License Agreement**.
5. 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 only on Windows 10.

6. If a MultiTech device is connected to the computer, disconnect it and click **Next**.
7. 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.

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

A separate wizard opens for installing Telit drivers. Some MultiTech devices use embedded modules from Telit Wireless Solutions to provide cellular connectivity; these devices require Telit drivers.

10. Select **Complete** setup type.
11. When the drivers are installed, click **Finish**.
12. In the Setup Wizard, click **Finish**.

Note:

- To open Connection Manager after installation, check **Start the MultiTech Connection Manager when the installation is finished**.
- After the drivers are installed, you need to restart your computer if prompted by Windows.

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](#).

Note: The –L6G1 radio establishes a connection automatically as soon as the device is plugged into a PC with Windows OS. No configuration or connection steps are required with this device.

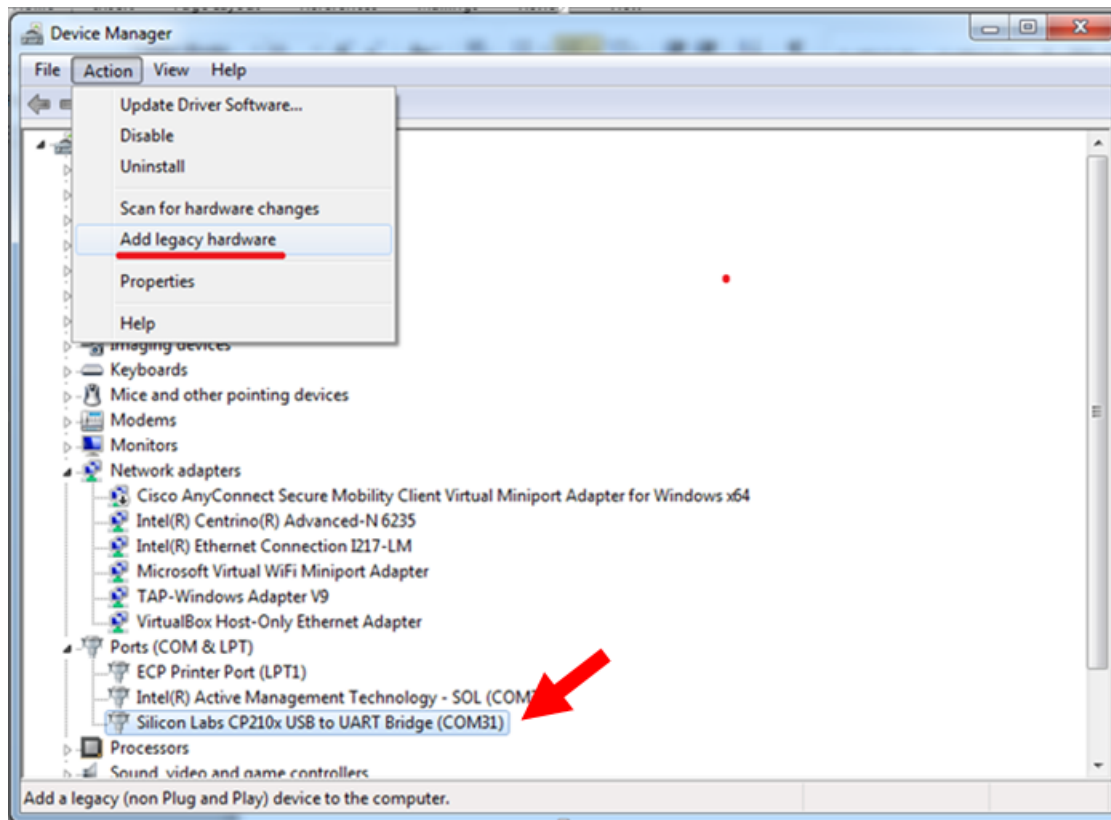
Setting Up a Serial Device in Windows Device Manager

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.
- Set up the device in Device Manager. Refer to [Setting Up a Serial Device in Windows Device Manager](#).

Note: The –L6G1 radio establishes a connection automatically as soon as the device is plugged into a PC with Windows OS. No configuration or connection steps are required with this device.

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.

Note: For –L6G1 radios, dial number is disabled.

- 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.

Note: For –L6G1 radios, dial number is disabled.

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.

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

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**.

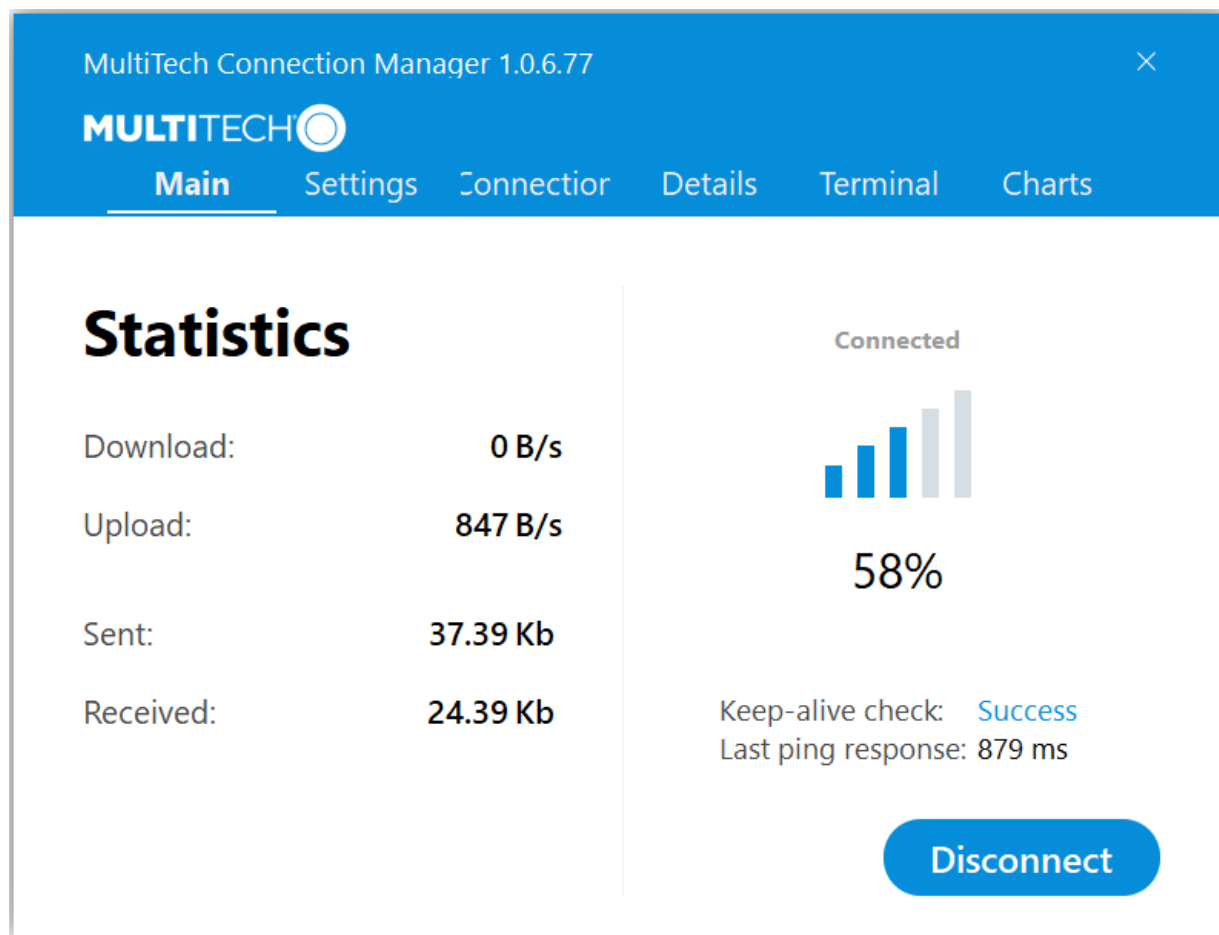
Connection Manager and the installed drivers are removed from the computer.

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



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.

MultiConnect Cell USB Modem is not detected

1. Check the Power and LS LEDs on the device. If they are not continuously lit, 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.